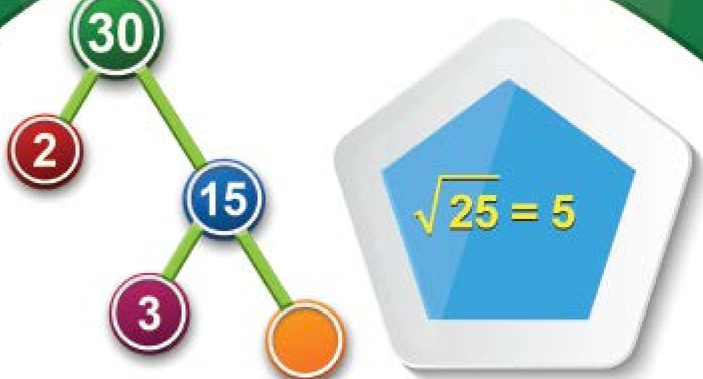
Hisabati

Kitabu cha Mwanafunzi

Darasa la Tano



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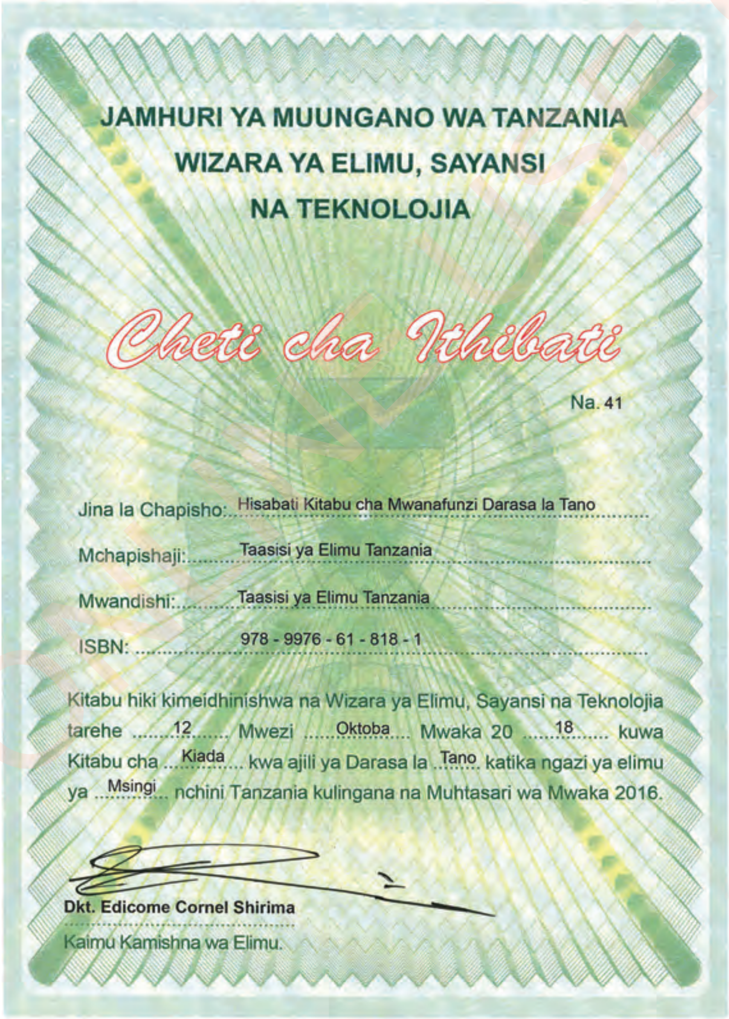
JAMHURI YA MUUNGANO WA TANZANIA
WIZARA YA ELIMU, SAYANSI
NA TEKNOLOJIA

Cheti cha Ithibati

Na. 41

Jina la Chapisho: Hisabati Kitabu cha Mwanafunzi Darasa la Tano

Mchapishaji: Taasisi ya Elimu Tanzania

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Kitabu hiki kimeidhinishwa na Wizara ya Elimu, Sayansi na Teknolojia tarehe 12 Mwezi Oktoba Mwaka 20 18 kuwa Kitabu cha Kiada kwa ajili ya Darasa la Tano katika ngazi ya elimu ya Msingi nchini Tanzania kulingana na Muhtasari wa Mwaka 2016.

Dkt. Edicome Cornel Shirima
Kaimu Kamishna wa Elimu.

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Dar es Salaam

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Utangulizi

Kitabu hiki ni cha tano katika mfululizo wa vitabu kilichoandaliwa mahususi kwa mwanafunzi wa Darasa la Tano. Kitabu hiki kinalenga kukuendeleza katika kujenga stadi za kuhesabu, kuandika na kusoma huku ukijenga msingi wa Hisabati. Aidha, kitabu hiki kina sura kumi na sita zilizoandaliwa ili kukidhi mahitaji ya muhtasari wa somo la Hisabati Darasa la Tano.

Sura zilizoainishwa katika kitabu hiki ni pamoja na namba nzima, kujumlisha namba, kutoa namba, kuzidisha namba, kugawanya namba, namba za Kirumi, aina za namba, vigawo na vigawe, sehemu, desimali, vipeo na vipeuo, wakati, vipimo vya metriki, fedha ya Tanzania, jiometri, aljebra na takwimu.

Kwa kujifunza sura hizi, utaweza kujenga stadi zinazokuwezesha kutumia lugha ya Hisabati katika kuwasilisha hoja au wazo, kufikiri na kuhakiki katika maisha ya kila siku, na kutatua matatizo katika mazingira tofauti.

Hakikisha unafanya shughuli na mazoezi yote katika kitabu hiki ili uweze kupata umahiri uliokusudiwa. Shirikiana na wenzako katika kujifunza.

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Shukurani

Taasisi ya Elimu Tanzania (TET) inatambua na kuthamini mchango muhimu wa washiriki waliofanikisha uandishi wa kitabu hiki cha mwanafunzi.

TET inatoa shukurani za dhati kwa mchango uliotolewa na wataalamu wafuatao walioshiriki kutayarisha kitabu hiki:

Waandishi: Jonathan H. Paskali, Matembele C. Daniel, Ruth K. Buluda, Skolastika A. Kulanga, Monica A. Mbuya, Morwo L. Mollel, Inyasi K. Makiya, Juliana D. Nyambo, Marcus K. Rajabu, Ramadhani A. Kitiku, Lucia D. Chamtitu, Johnson N. Shenyenge na Athumani S. Hango.

Wahariri: Dkt. Sylvester E. Rugeihyamu (Mwenyekiti wa jopo), Jopo la wahariri na Mussa R. Kaoneka (BAKITA).

Msanifu: Amani J. Kweka

Wachoraji: Alama Art and Media Production Limited

Mratibu: Jonathan H. Paskali

Pia, TET inatoa shukurani kwa shule zote zilizoshiriki katika ujaribishaji wa kitabu hiki.

Aidha, Taasisi inatoa shukurani za pekee kwa Wizara ya Elimu, Sayansi na Teknolojia kwa kusimamia kwa karibu zoezi zima la uandishi wa kitabu hiki.

Dkt. Aneth A. Komba
Mkurugenzi Mkuu
Taasisi ya Elimu Tanzania

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Sura ya Kwanza

Namba nzima

Katika Darasa la Nne, ulijifunza kuhesabu, kubaini thamani ya tarakimu, kusoma na kuandika namba hadi tisini na tisa elfu mia tisa tisini na tisa. Katika sura hii, utaendelea kujifunza kuhesabu, kubaini thamani ya tarakimu katika namba, kusoma na kuandika namba zenye thamani hadi milioni moja.

Zoezi la 1: Marudio

1. Jaza nafasi zilizoachwa wazi katika kila mfululizo:
   (a) 3 220, 3 230, 3 240, 3 250, 3 260, _______, _______, _______ .
   (b) _______, _______, _______, 99 996, 99 997, 99 998, 99 999.
   (c) 59 100, 59 200, 59 300, 59 400, _______, _______, _______ .
   (d) _______, _______, 30 000, 40 000, 50 000, _______, _______, _______, 90 000.
2. Katika kila kipengele cha namba zifuatazo, andika namba kwa kupunguza moja katika namba uliyopewa.
   (a) 40 000, _______ (b) 69 992, _______ .
   (c) 11 145, _______ .
3. Andika namba zinazotangulia namba zifuatazo kwa kupunguza moja katika namba uliyopewa.
   (a) _____, 20 000 (b) _____, 51 202 (c) ____, 98 433

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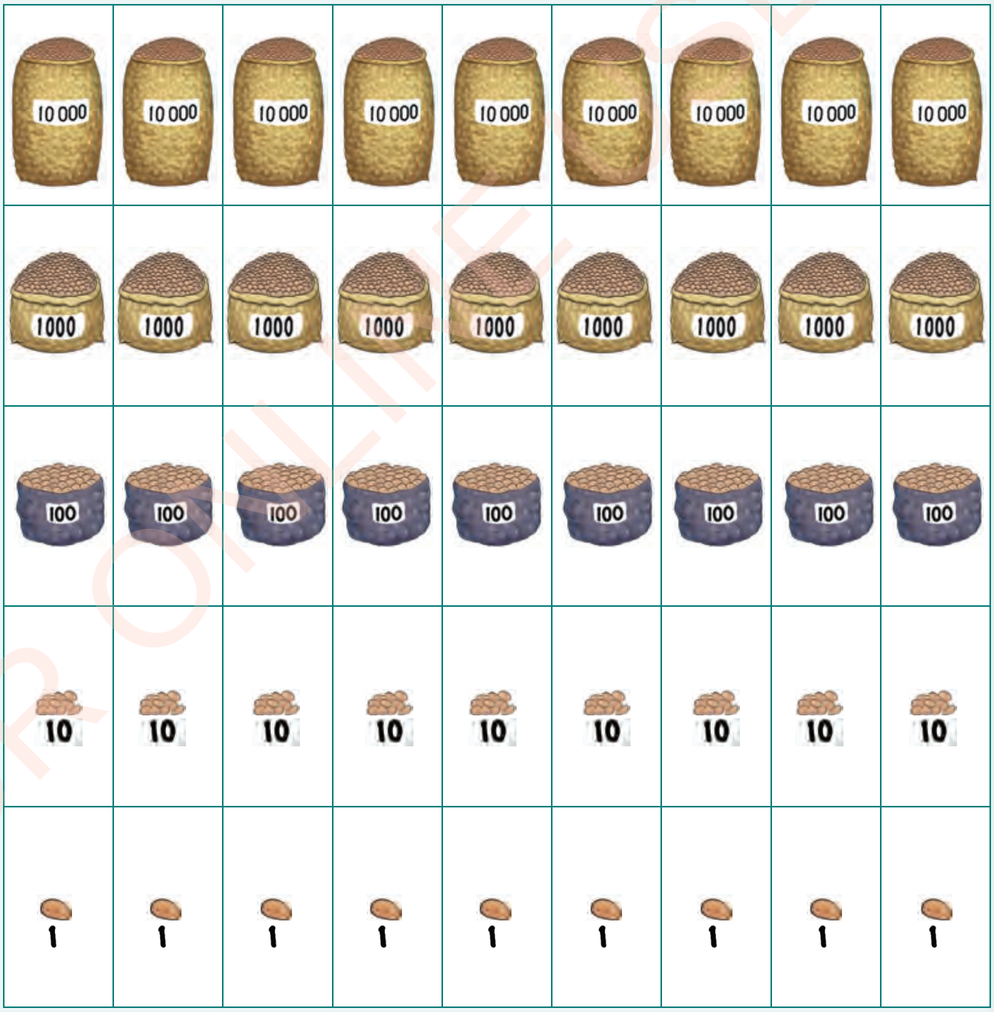
4. Kwa kutumia tarakimu 7, 8, 3, 2 na 1, andika namba zifuatazo iwapo kila tarakimu itatumika mara moja tu.

(a) Namba ndogo kabisa inayotokana na tarakimu hizo.

(b) Namba kubwa kabisa inayotokana na tarakimu hizo.

5. Kuna mamia mangapi katika kumi elfu?

6. Mifuko ifuatayo imejazwa viazi, na vingine havipo katika mifuko. Idadi ya viazi kwa kila fungu imeandikwa. Hesabu mifuko ya viazi na viazi visivyo kwenye mifuko kisha andika idadi ya viazi vyote kwa tarakimu na kwa maneno.



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7. Jaza kwa tarakimu au kwa maneno namba zinazokosekana katika jedwali.

Namba kwa tarakimu	Namba kwa maneno
12 767	
	Elfu thelathini na tano na ishirini na tatu
87 654	
	Elfu kumi na mbili mia saba themanini
56 789	
	Kumi elfu na tano

8. Fafanua namba zifuatazo kwa kuzingatia thamani ya kiwango cha kila tarakimu.

(a) 27 256 (b) 35 268 (c) 17 890

(d) 97 871 (e) 82 337

9. Tumia namba 19 574, 99 861, 65 439, 74 200 na 45 617 kujibu maswali yafuatayo:

(a) Namba ipi ina 5 katika nafasi ya mamia?
(b) Namba ipi ina 1 katika nafasi ya mamoja?
(c) Namba ipi ina 4 katika nafasi ya maelfu?
(d) Namba ipi ina 6 katika nafasi ya makumi elfu?
(e) Namba ipi ina 7 katika nafasi ya makumi?

10. Andika kwa tarakimu namba zinazotokana na nafasi za thamani zifuatazo:

(a) Makumi elfu tano, maelfu mbili, mamia sifuri, makumi tatu na mamoja tisa.

(b) Makumi elfu moja, maelfu nane, mamia tisa, makumi sifuri na mamoja moja.

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(c) Makumi elfu tisa, maelfu mbili, mamia sifuri, makumi nane na mamoja saba.

(d) Makumi elfu saba, maelfu nane, mamia nne, makumi sita na mamoja nane.

(e) Makumi elfu mbili, maelfu tatu, mamia sita, makumi nne na mamoja mbili.

Kuhesabu kwa mafungu

Vitu huhesabiwa kimojakimoja au kwa mafungu. Kuhesabu kitu kimojakimoja ni rahisi iwapo idadi ya vitu ni ndogo. Vitu vikiwa vingi, uhesabuji hurahisishwa kwa kuviweka vitu hivyo katika mafungu.

Kuhesabu hadi 500 000

Mfano wa 1

Hesabu kadi za namba zifuatazo za elfu kumikumi.

10 000	10 000	10 000	10 000	10 000
10 000	10 000	10 000	10 000	10 000

Baada ya kuhesabu utapata idadi ya kadi kumi za elfu kumi kila moja. Jumla ya namba katika kadi zote ni sawa na mia moja elfu au laki moja.

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Mfano wa 2

Chunguza picha namba 1, 2 na 3 kisha jibu swali linalofuata.

Picha namba 1: Noti za shilingi elfu kumi

Picha namba 2: Noti za shilingi elfu moja

Picha namba 3: Noti za shilingi mia tano

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Swali

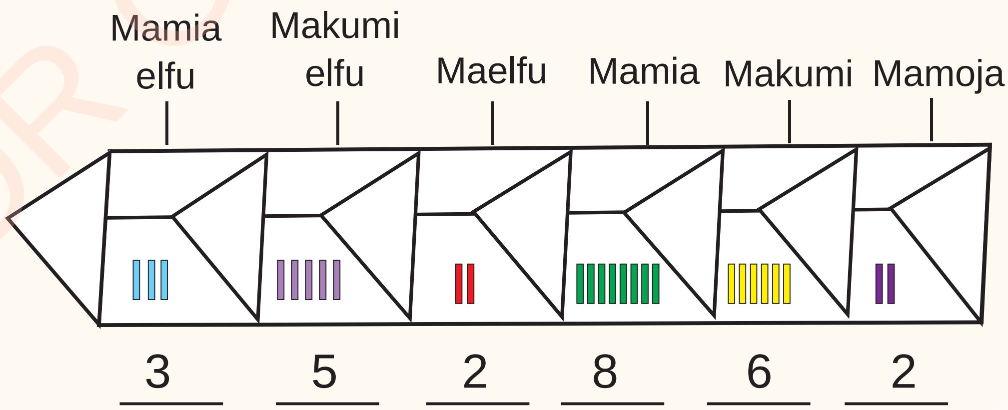
Hesabu na kisha andika jumla ya thamani ya fedha zote zinazoonekana katika picha namba 1 hadi 3.

Hatua:

1. Hesabu noti za shilingi elfu kumi katika picha namba 1. Zipo idadi ya noti 9 zenye thamani ya shilingi 90 000.
2. Hesabu noti za shilingi elfu moja katika picha namba 2. Zipo idadi ya noti 9 zenye thamani ya shilingi 9 000.
3. Hesabu noti za shilingi mia tano katika picha namba 3. Zipo idadi ya noti 2 zenye thamani ya shilingi 1 000.
4. Hesabu na weka pamoja thamani ya noti za shilingi 1 000 ambazo zipo 9 na noti za shilingi 500 ambazo zipo 2, jumla ni shilingi 10 000.
5. Ukihesabu noti zote kwa pamoja ambazo ni shilingi 90 000 ongeza shilingi 10 000 unapata shilingi 100 000. Namba hiyo husomwa, mia moja elfu au laki moja.

Mfano wa 3

Hesabu chaki zilizomo katika sinia la kuhesabia namba lifuatalo kisha andika namba inayowakilishwa na chaki hizo.



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Hatua:

1. Hesabu idadi ya chaki katika mamoja, zipo 2: Andika 2 katika nafasi ya mamoja.
2. Hesabu idadi ya chaki katika makumi, zipo 6: Andika 6 katika nafasi ya makumi.
3. Hesabu idadi ya chaki katika mamia, zipo 8: Andika 8 katika nafasi ya mamia.
4. Hesabu idadi ya chaki katika maelfu, zipo 2: Andika 2 katika nafasi ya maelfu.
5. Hesabu idadi ya chaki katika makumi elfu, zipo 5: Andika 5 katika nafasi ya makumi elfu.
6. Hesabu idadi ya chaki katika mamia elfu, zipo 3. Andika 3 katika nafasi ya mamia elfu. Namba hii iliyopo chini ya sinia la kuhesabia namba, husomwa mia tatu hamsini na mbili elfu mia nane sitini na mbili au laki tatu hamsini na mbili elfu mia nane sitini na mbili. Namba inayotokana na thamani hizo ni 352 862.

Zoezi la 2

Jibu maswali yafuatayo:

1. Jaza nafasi zilizoachwa wazi kwa kupunguza mbilimbili:

(a) 1 200, ____, ____, ____ .

(b) 2153, ____, ____, ____ .

2. Ikiwa una hesabu kwa kuongeza mojamoja, andika namba tatu zinazofuata baada ya:

(a) 99 995 (b) 34 628

(c) 222 222 (d) 102 100

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3. Kamilisha jedwali hili kwa kuzingatia nafasi ya thamani ya kila tarakimu.

Namba	Mamia elfu	Makumi elfu	Maelfu	Mamia	Makumi	Mamoja
(a) 100 000						
(b) 65 232						
(c) 364 207						
(d) 200 001						
(e) 42 761						

4. Andika namba tatu zinazotangulia namba zifuatazo ikiwa utahesabu kwa kupunguza elfu mojamoja.

(a) 400 000 (b) 300 107 (c) 290 050 (d) 165 000

5. Jaza nafasi zilizoachwa wazi ikiwa utahesabu kwa tanotano:

(a) 12 456, _____, _____, _____.

(b) Laki mbili, ______, ______, ______.

(c) ______, ______, ______, 305 005.

(d) Kumi na tano elfu, ______, ______, ______.

(e) Laki nne kumi na tano elfu, ______, ______, ______.

6. Andika kuanzia 300 000 hadi 500 000 kwa kuongeza elfu arobaini kwa kila namba.

Kuhesabu hadi 1 000 000

Mfano wa 1

Chunguza noti za shilingi elfu kumi zilizofungwa katika mafungu ya laki mojamoja kisha hesabu kwa laki mojamoja.

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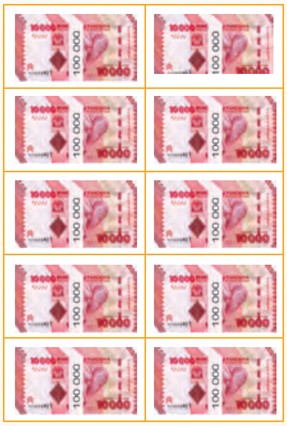

sawa na

Ukihesabu mafungu hayo ya laki mojamoja, utapata mafungu kumi ya laki mojamoja. Hii ni sawa na milioni moja. Kwa hiyo, milioni moja ni sawa na mafungu kumi ya laki moja.

Mfano wa 2

Makopo yafuatayo yana vidonge kulingana na idadi inayoonekana kwenye kila kopo. Hesabu makopo kisha andika jumla ya vidonge vya makopo yote.

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Hatua:

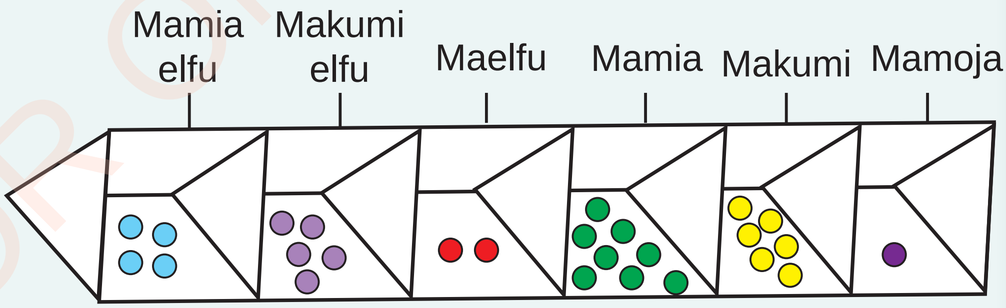
1. Hesabu makopo yenye kibandiko cha 100 000, yapo 9 yenye jumla ya vidonge 900 000.
2. Hesabu makopo yenye kibandiko cha 10 000, yapo 9 yenye jumla ya vidonge 90 000.
3. Hesabu makopo yenye kibandiko cha 1 000, yapo 10 yenye jumla ya vidonge 10 000.
4. Idadi ya vidonge katika makopo yote ni 900 000 ongeza 90 000, kisha ongeza 10 000, unapata 1 000 000. Kuna jumla ya vidonge 1 000 000 ambayo husomwa milioni moja.

   Kwa hiyo, makopo yote hayo yana jumla ya vidonge milioni moja.

Zoezi la 3

Jibu maswali yafuatayo:

1. Hesabu vitu katika sinia la kuhesabia namba lifuatalo na andika idadi ya vitu katika nafasi zilizo wazi. Andika idadi hiyo kwa maneno na kwa tarakimu.



_____ _____ _____ _____ _____ _____

2. Andika nafasi ya thamani ya namba 1 katika 1 000 000.

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3. Jaza nafasi zilizoachwa wazi katika mifululizo ifuatayo:

(a) 100 000, ____, 300 000, 400 000, _____.

(b) 729 600, 729 590, ____, ____, ____, 729 550, 729 540.

(c) ____, ____, ____, 141 000, 142 000, ___, 144 000.

4. Andika namba tatu zinazofuata kwa kila mfululizo ikiwa utahesabu kwa kuongeza miamia.

(a) 699 200, ______, ______, ______.

(b) 300 000, ______, ______, ______.

(c) 100 480, ______, ______, ______.

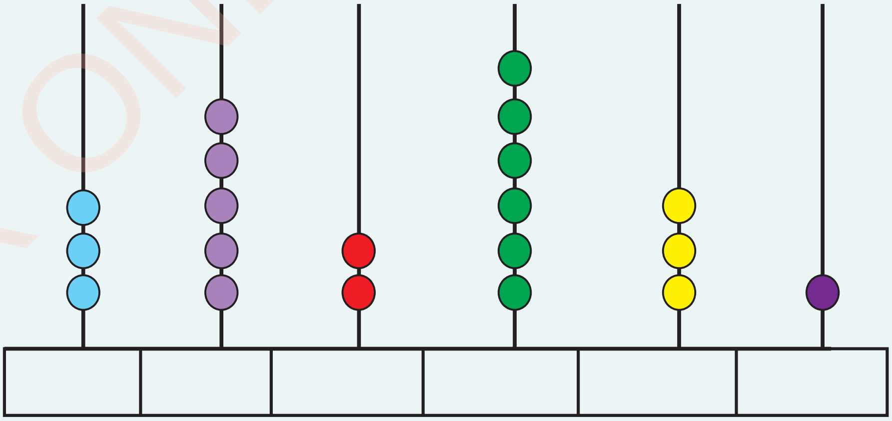
(d) 899 000, ______, ______, ______.

5. Kwa kutumia tarakimu 4, 2, 9, 7, 8 na 1, andika namba zifuatazo iwapo kila tarakimu itatumika mara moja tu.

(a) Namba kubwa kabisa kwa kutumia tarakimu zote sita.

(b) Namba ndogo kabisa kwa kutumia tarakimu zote sita.

6. Hesabu na kisha andika namba inayotokana na vihesabio katika abakasi ifuatayo:



7. Ukiwa unahesabu kwa elfu mojamoja, andika namba tano zinazofuata baada ya laki tano.

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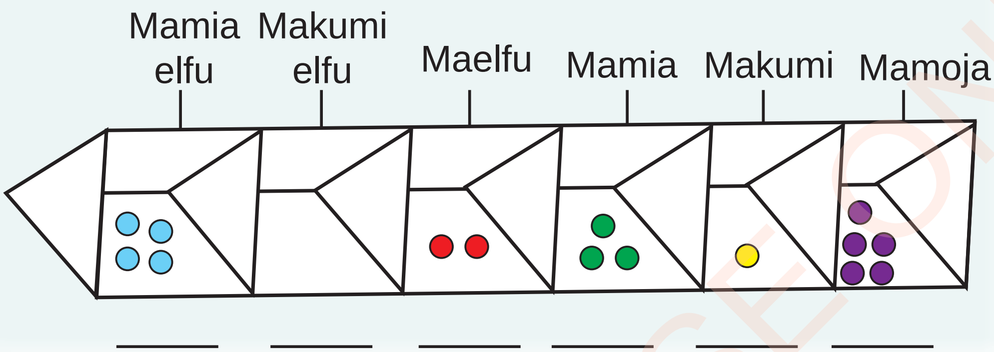
8. Andika mfululizo wa namba kuanzia laki mbili na sabini elfu hadi laki tatu na hamsini elfu kwa kuongeza elfu kumikumi.

9. Andika namba inayotokana na tarakimu zilizopo katika sinia la kuhesabia namba lifuatalo:



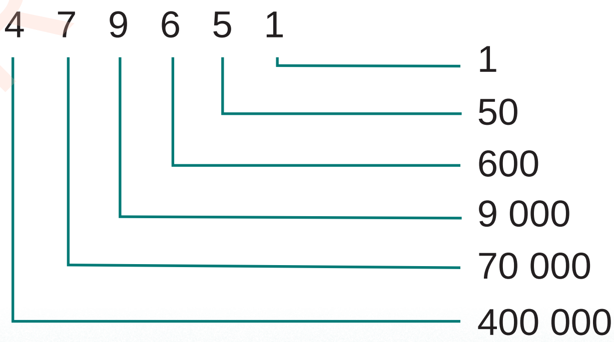
Thamani ya tarakimu katika namba

Thamani ya tarakimu katika namba huongezeka kutoka kulia kuelekea kushoto, ambayo ni kutoka mamoja, makumi, hadi mamia elfu na kuendelea.

Thamani ya kiwango cha tarakimu katika namba

Hii ni thamani inayotafutwa kwa kuangalia nafasi ya tarakimu husika katika namba.

Kwa mfano, thamani ya kiwango cha kila tarakimu katika 479 651 ni kama ifuatavyo:



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Mfano

Andika thamani ya kiwango cha 9 katika 89 670.

Jibu

Thamani ya kiwango cha 9 katika 89 670 ni 9 000.

Kufafanua namba

Kufafanua namba ni tendo la kuandika namba katika thamani za namba na hutumia tendo la kujumlisha. Unapofafanua namba, anza na thamani ya kiwango kikubwa cha tarakimu hadi kiwango kidogo.

Mfano

Fafanua namba zifuatazo:

Namba	Ufafanuzi
(a) 26 713	20 000 + 6 000 + 700 + 10 + 3
(b) 41 023	40 000 + 1 000 + 0 + 20 + 3
(c) 129 567	100 000 + 20 000 + 9 000 + 500 + 60 + 7

Zoezi la 4

Jibu maswali yafuatayo:

1. Andika nafasi ya thamani ya kila tarakimu katika namba zifuatazo:

(a) 461 585 (b) 147 295 (c) 947 231

(d) 417 293 (e) 531 278

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2. Fafanua namba zifuatazo kwa kuzingatia thamani ya viwango vya kila tarakimu:

(a) 401 627 (b) 561 894 (c) 300 002
(d) 261 578 (e) 987 351

3. Tumia namba zifuatazo kujaza nafasi zilizoachwa wazi:

(a) 724 564 ina mamia elfu ____, makumi elfu ____, maelfu ____, mamia ____, makumi ____ na mamoja____

(b) 612 702 ina mamia elfu ____, makumi elfu ____, maelfu ____, mamia ____, makumi ____ na mamoja____

(c) 394 189 ina mamia elfu ____, makumi elfu ____, maelfu ____, mamia ____, makumi ____ na mamoja ____

(d) 100 364 ina mamia elfu ____, makumi elfu ____, maelfu ____, mamia ____, makumi ____ na mamoja ____

(e) 999 998 ina mamia elfu ____, makumi elfu ____, maelfu____, mamia____, makumi ____, na mamoja ____

4. Namba ipi ni kubwa zaidi kati ya hizi?
444 144, 444 444, 444 441, 434 444, 414 444

5. Kati ya namba hizi ipi ni ndogo zaidi?
661 256, 663 666, 666 166, 666 646, 616 666

6. Andika nafasi ya thamani ya 9 katika namba zifuatazo:
(a) 392 527 (b) 579 711 (c) 418 692

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Kusoma na kuandika namba hadi 1 000 000

Kusoma namba

Namba husomwa kwa kuzingatia thamani ya tarakimu kuanzia kushoto kuelekea kulia.

Mfano wa 1

Soma namba zifuatazo:

Namba	Namba inavyosomeka
105 202	Mia moja na tano elfu mia mbili na mbili au laki moja na elfu tano mia mbili na mbili
254 000	Mia mbili hamsini na nne elfu au laki mbili hamsini na nne elfu
100 006	Mia moja elfu na sita au laki moja na sita

Mfano wa 2

Soma namba zifuatazo:

(a) 311 008 Mia tatu kumi na moja elfu na nane au laki tatu kumi na moja elfu na nane

(b) 101 008 Mia moja na moja elfu na nane au laki moja na moja elfu na nane

(c) 411 000 Mia nne kumi na moja elfu au laki nne kumi na moja elfu

(d) 500 709 Laki tano mia saba na tisa au mia tano elfu mia saba na tisa

(e) 1 000 000 Milioni moja

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Zoezi la 5

Jibu maswali yafuatayo:

1. Soma namba zifuatazo:

a) 99 999, 100 000, 100 001, 100 002, 100 003, 100 004, 100 005.

b) 100 010, 100 020, 100 030, 100 040, 100 050, 100 060, 100 070.

c) 200 200, 200 400, 200 600, 200 800, 201 000, 201 200, 201 400.

d) 113 999, 199 922, 497 007, 931 311, 100 003.

2. Soma namba katika jedwali lifuatalo kisha andika zinavyosomwa:

Namba	Namba inavyosomwa
128 749	
338 952	
876 187	
997 000	
872 006	
984 901	
888 888	
440 690	
300 003	
772 024	

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Kuandika namba kwa maneno na kwa tarakimu

Mfano wa 1

Andika kwa tarakimu.

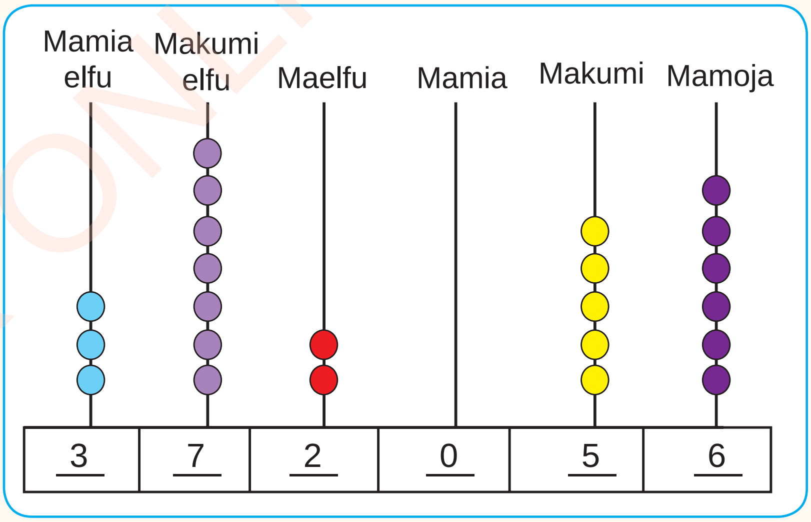
1. Mia moja na saba elfu mia tano na tano
2. Mia saba themanini na tisa elfu
3. Laki mbili sitini na sita elfu na nane

Jibu

1. Mia moja na saba elfu mia tano na tano, kwa tarakimu ni 107 505.
2. Mia saba themanini na tisa elfu , kwa tarakimu ni 789 000.
3. Laki mbili sitini na sita elfu na nane, kwa tarakimu ni 266 008.

Mfano wa 2

Andika na soma namba inayotokana na vihesabio katika abakasi ifuatayo:



Namba inayowakilishwa ni 372 056 na inasomwa, mia tatu sabini na mbili elfu na hamsini na sita.

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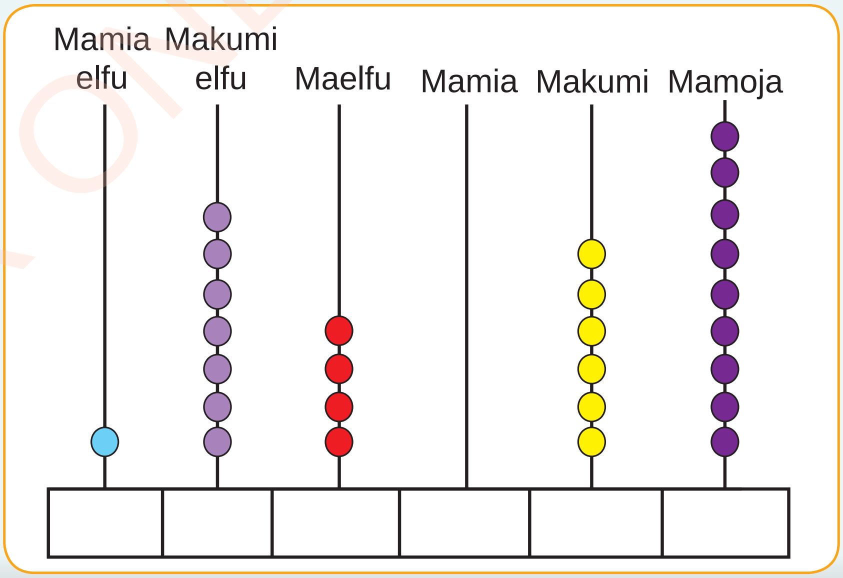
Zoezi la 6

Jibu maswali yafuatayo:

1. Soma jedwali lifuatalo kisha andika namba hizo kwa tarakimu:

Namba kwa maneno	Namba kwa tarakimu
(a) Milioni moja	
(b) Mia tano elfu mia nne na thelathini	
(c) Mia tisa themanini elfu na arobaini na mbili	
(d) Mia moja ishirini na saba elfu mia tisa	
(e) Laki nne	
(f) Mia nne elfu na nne	
(g) Laki tatu elfu sabini na ishirini	
(h) Mia nane elfu mia tano hamsini na saba	
(i) Mia moja elfu na moja	

2. Andika namba kwa maneno na kwa tarakimu inayowakilishwa katika abakasi ifuatayo:



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Zoezi la 7

Jibu maswali yafuatayo:

1. Jaza nafasi zilizoachwa wazi katika kila mfuatano.

(a) 234 566, ____, ____, 234 569, ____, ____, 234 572.

(b) 359 000, 358 000, ____, ____, ____, 354 000.

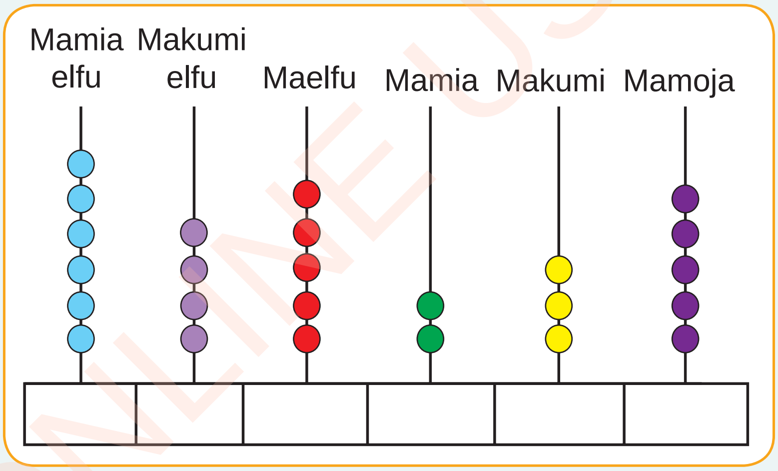
(c) ____, ____, ____, 400 000, 500 000, 600 000.

(d) 155 600, _____, _____, 155 300, 155 200, _____, _____ .

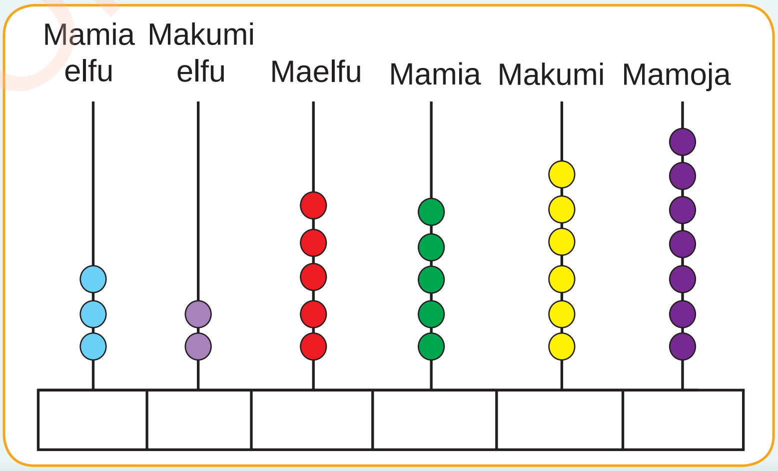
(e) ____, ____, ____, 840 000, ____, 860 000, 870 000.

2. Tumia michoro ya abakasi ifuatayo kuhesabu na kuandika namba zinazowakilishwa na michoro hiyo.

(a)



(b)



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3. Andika namba 300 110 kwa maneno.

4. Andika kwa tarakimu namba zilizo kwenye jedwali lifuatalo:

	Namba kwa maneno	Namba kwa tarakimu
(a)	Mia mbili tisini na tano elfu mia saba hamsini	
(b)	Mia tatu elfu na sitini na tano	
(c)	Mia tisa tisini na tisa elfu mia tisa tisini na tisa	
(d)	Mia moja hamsini elfu	
(e)	Mia saba themanini na saba elfu na saba	

5. Fafanua 763 631 kwa kutumia thamani ya kila tarakimu.

6. Andika namba 900 000 + 30 000 + 1 000 + 300 + 50 + 4 kwa kifupi.

7. Andika nafasi ya thamani ya 7 katika namba zifuatazo:

(a) 867 652 (b) 879 543 (c) 236 374

(d) 374 964 (e) 721 603

8. Andika namba zifuatazo kwa maneno:

(a) 311 321 (b) 401 719 (c) 572 900

(d) 200 535 (e) 145 130

Jikumbushe

1. Unapobaini thamani ya tarakimu kwenye namba, angalia nafasi ya tarakimu hiyo kwenye namba husika.
2. Mafungu ya vitu vya kuhesabu huweza kuwa na ukubwa tofauti.
3. Unapofafanua namba, anza na thamani ya kiwango kikubwa cha tarakimu hadi kiwango kidogo.

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Sura ya Pili

Kujumlisha namba

Katika Darasa la Nne, ulijifunza kujumlisha namba zenye jumla isiyozidi 99 999. Katika sura hii, utajifunza kujumlisha namba zenye jumla isiyozidi 1 000 000. Vilevile, utaendelea kujifunza mafumbo yenye dhana ya kujumlisha.

Zoezi la 1: Marudio

Jibu maswali yafuatayo:

1. 61 345 + 32 134 =
2. 82 071 + 7 928 =
3. 463 + 11 125 =
4. 44 455 + 3 342 =
5. 35 678 + 4 375 =
6. 3 607 + 56 124 =
7. 25 041 + 7 268 =
8. 65 487 + 25 380 =

9. $\begin{array}{r} 48\,507 \\ +\ 38\,690 \\ \hline \\ \hline \end{array}$

10. $\begin{array}{r} 6\,457 \\ +\ 23\,564 \\ \hline \\ \hline \end{array}$

11. $\begin{array}{r} 38\,735 \\ +\ 51\,306 \\ \hline \\ \hline \end{array}$

12. $\begin{array}{r} 62\,664 \\ +\ 817 \\ \hline \\ \hline \end{array}$

13. $\begin{array}{r} 26\,663 \\ +\ 32\,310 \\ \hline \\ \hline \end{array}$

14. $\begin{array}{r} 4\,073 \\ +\ 21\,825 \\ \hline \\ \hline \end{array}$

15. $\begin{array}{r} 36\,457 \\ +\ 53\,442 \\ \hline \\ \hline \end{array}$

16. $\begin{array}{r} 75\,543 \\ +\ 432 \\ \hline \\ \hline \end{array}$

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17. Elineema alikuwa na machungwa 56 784, na Flora alikuwa na machungwa 33 912. Elineema na Flora walikuwa na jumla ya machungwa mangapi?
18. Wilaya ya Mvomero ilikuwa na wanafunzi 34 006 wanaosoma shule za msingi na 28 543 wanaosoma shule za sekondari. Wilaya hiyo ilikuwa na jumla ya wanafunzi wangapi wanaosoma shule za msingi na sekondari?
19. Kijiji cha Ujamaa kilikuwa na mbuzi 78 000 na Kijiji cha Muungano kilikuwa na mbuzi 16 492. Je, vijiji vyote viwili vilikuwa na jumla ya mbuzi wangapi?
20. Walimu walihudhuria mafunzo ya kitaaluma kwa awamu mbili. Awamu ya kwanza walihudhuria walimu 44 200. Awamu ya pili walihudhuria walimu 55 407. Je, ni walimu wangapi jumla waliohudhuria mafunzo hayo?

Kujumlisha namba bila kubadili

Unapojumlisha namba, hakikisha unazingatia nafasi ya kila tarakimu katika namba. Anza kujumlisha mamoja kwa mamoja, makumi kwa makumi, mamia kwa mamia, maelfu kwa maelfu, makumi elfu kwa makumi elfu, mamia elfu kwa mamia elfu na kuendelea.

Kujumlisha kwa mpangilio wa ulalo

Mfano wa 1

888 888 + 110 011 =

Hatua:

1. Jumlisha mamoja:
   8 + 1 = 9. Andika 9 katika nafasi ya mamoja.

   888 888 + 110 011= _ _ _ _ _ 9

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2. Jumlisha makumi:
8 + 1 = 9. Andika 9 katika nafasi ya makumi. — 888 888 + 110 011 = _ _ _ _ _99

3. Jumlisha mamia:
8 + 0 = 8. Andika 8 katika nafasi ya mamia. — 888 888 + 110 011= _ _ _ 899

4. Jumlisha maelfu:
8 + 0 = 8. Andika 8 katika nafasi ya maelfu. — 888 888 + 110 011= _ _ 8 899

5. Jumlisha makumi elfu:
8 + 1 = 9. Andika 9 katika nafasi ya makumi elfu. — 888 888 + 110 011= _ 98 899

6. Jumlisha mamia elfu:
8 + 1 = 9. Andika 9 katika nafasi ya mamia elfu. — 888 888 + 110 011 = 998 899

Kwa hiyo, 888 888 + 110 011 = 998 899.

Mfano wa 2

34 487 + 42 002 = 76 489

Zoezi la 2

Jumlisha namba zifuatazo:

1. 445 702 + 231 264 =

2. 45 536 + 210 431 =

3. 647 775 + 200 003 =

4. 803 414 + 121 405 =

5. 715 109 + 263 780 =

6. 610 243 + 379 542 =

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7. 665 544 + 332 255 =	**14.** 230 000 + 144 348 =
8. 785 432 + 213 467 =	**15.** 374 136 + 25 862 =
9. 835 201 + 163 348 =	**16.** 811 133 + 141 556 =
10. 631 594 + 246 305 =	**17.** 666 777 + 333 222 =
11. 13 451 + 240 037 =	**18.** 344 342 + 454 656 =
12. 524 321 + 143 442 =	**19.** 334 434 + 544 204 =
13. 912 340 + 45 426 =	**20.** 567 891 + 431 107 =

Kujumlisha kwa mpangilio wa wima

Mfano wa 1

$$\begin{array}{r} 235\ 641 \\ +\ 621\ 357 \\ \hline \\ \hline \end{array}$$

Njia

Kwa njia ya wima namba hizi zinaweza kuandikwa kama ifuatavyo:

Mamia elfu	Makumi elfu	Maelfu	Mamia	Makumi	Mamoja
2	3	5	6	4	1
+ 6	2	1	3	5	7
8	5	6	9	9	8

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Mfano wa 2

$$\begin{array}{r} 453\ 472 \\ +\ \ 316\ 513 \\ \hline \\ \hline \end{array}$$

Hatua:

1. Panga namba kwa wima katika chati ya viwango.

	Mamia elfu	Makumi elfu	Maelfu	Mamia	Makumi	Mamoja
	4	5	3	4	7	2
+	3	1	6	5	1	3
	7	6	9	9	8	5

2. Jumlisha mamoja: 2 + 3 = 5. Andika 5 katika nafasi ya mamoja.
3. Jumlisha makumi: 7 + 1 = 8. Andika 8 katika nafasi ya makumi.
4. Jumlisha mamia: 4 + 5 = 9. Andika 9 katika nafasi ya mamia.
5. Jumlisha maelfu: 3 + 6 = 9. Andika 9 katika nafasi ya maelfu.
6. Jumlisha makumi elfu: 5 + 1 = 6. Andika 6 katika nafasi ya makumi elfu.
7. Jumlisha mamia elfu: 4 + 3 = 7. Andika 7 katika nafasi ya mamia elfu.

   Kwa hiyo, jibu ni 769 985.

Mfano wa 3

$$\begin{array}{r} 238\ 275 \\ +\ \ 500\ 623 \\ \hline 738\ 898 \\ \hline \end{array}$$

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Zoezi la 3

Jibu maswali yafuatayo:

1.
```
  731 546
+ 166 422
_________
```

2.
```
   99 999
+ 100 000
_________
```

3.
```
  342 643
+ 455 136
_________
```

4.
```
  232 738
+ 756 041
_________
```

5.
```
  857 432
+ 131 456
_________
```

6.
```
   41 755
+ 328 142
_________
```

7.
```
  800 000
+ 167 489
_________
```

8.
```
  224 466
  200 000
+ 550 533
_________
```

9.
```
  340 405
+ 314 582
_________
```

10.
```
  137 452
+  62 540
_________
```

11.
```
   75 000
+ 504 643
_________
```

12.
```
  934 533
+  45 302
_________
```

13.
```
  630 402
+ 207 294
_________
```

14.
```
  720 340
+ 108 637
_________
```

15.
```
  244 336
  135 452
+ 210 111
_________
```

16.
```
  712 734
+ 275 005
_________
```

17.
```
  710 247
+   9 340
_________
```

18.
```
  569 732
+ 430 021
_________
```

19.
```
   10 113
  129 274
+  60 612
_________
```

20.
```
  430 124
+ 546 004
_________
```


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Kujumlisha namba kwa kubadili

Kujumlisha kwa mpangilio wa ulalo

Mfano wa 1

846 484 + 152 486 =

Hatua:

1. Jumlisha mamoja:
   4 + 6 = 10. Andika 0 katika nafasi ya mamoja, peleka makumi 1 na jumlisha kwenye makumi.
   846 484 + 152 486 = _ _ _ _ _ 0

2. Jumlisha makumi:
   1 + 8 + 8 = 17. Andika 7 katika nafasi ya makumi, kisha weka mamia 1 na jumlisha kwenye mamia.
   846 484 + 152 486 = _ _ _ _ 70

3. Jumlisha mamia:
   1 + 4 + 4 = 9. Andika 9 katika nafasi ya mamia.
   846 484 + 152 486 = _ _ _ 970

4. Jumlisha maelfu:
   6 + 2 = 8. Andika 8 katika nafasi ya maelfu.
   846 484 + 152 486 = _ _ 8 970

5. Jumlisha makumi elfu:
   4 + 5 = 9. Andika 9 katika nafasi ya makumi elfu.
   846 484 + 152 486 = _ 98 870

6. Jumlisha mamia elfu:
   8 + 1 = 9. Andika 9 katika nafasi ya mamia elfu.
   846 484 + 152 486 = 998 970

Kwa hiyo, 846 484 + 152 486 = 998 970.

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Mfano wa 2

239 879 + 46 823 = 286 702

Zoezi la 4

Jumlisha namba zifuatazo:

1. 162 845 + 134 027 =

2. 293 586 + 26 323 =

3. 721 318 + 183 518 =

4. 526 517 + 34 048 =

5. 2 964 + 298 576 =

6. 784 049 + 108 187 =

7. 881 054 + 9 999 =

8. 786 951 + 118 275 =

9. 216 783 + 678 357 =

10. 484 888 + 200 286 =

11. 69 000 + 209 179 =

12. 567 183 + 384 921 =

13. 943 573 + 56 327 =

14. 700 852 + 279 168 =

15. 526 507 + 386 549 =

16. 298 745 + 650 124 =

17. 465 327 + 388 169 =

18. 7 250 + 428 866 =

19. 881 178 + 11 356 =

20. 877 778 + 66 665 =

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Kujumlisha kwa mpangilio wa wima

Mfano wa 1

$$\begin{array}{r} 228\ 186 \\ +\ 374\ 899 \\ \hline \\ \hline \end{array}$$

Njia

Panga namba kwa wima kwenye kadi ya viwango:

Mamia elfu	Makumi elfu	Maelfu	Mamia	Makumi	Mamoja
2+1	2+1	8+1	1+1	8+1	6
+ 3	7	4	8	9	9
6	10	13	10	18	15
6	0	3	0	8	5

Hatua:

1. Jumlisha mamoja: 6 + 9 = 15. Andika 5 katika nafasi ya mamoja, na weka makumi 1 katika nafasi ya makumi;
2. Jumlisha makumi: 1 + 8 + 9 = 18. Andika 8 katika nafasi ya makumi, na weka mamia 1 katika nafasi ya mamia;
3. Jumlisha mamia: 1 + 1 + 8 = 10. Andika 0 katika nafasi ya mamia, na weka maelfu 1 katika nafasi ya maelfu.
4. Jumlisha maelfu: 1 + 8 + 4 = 13. Andika 3 katika nafasi ya maelfu, na weka makumi elfu 1 katika nafasi ya makumi elfu.
5. Jumlisha makumi elfu: 1 + 2 + 7 = 10. Andika 0 katika nafasi ya makumi elfu, na weka mamia elfu 1 katika nafasi ya mamia elfu.
6. Jumlisha mamia elfu: 1 + 2 + 3 = 6.

Kwa hiyo, jibu ni 603 085.

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Mfano wa 2

$$\begin{array}{r} 456\,736 \\ +\quad 13\,497 \\ \hline \\ \hline \end{array}$$

Hatua:

1. Jumlisha mamoja: 6 + 7 = 13. Andika 3 katika nafasi ya mamoja, na jumlisha 1 katika makumi.	$\begin{array}{r} 456\,736 \\ +\quad 13\,497 \\ \hline 3 \\ \hline \end{array}$
2. Jumlisha makumi: 1 + 3 + 9 = 13. Andika 3 katika nafasi ya mamoja, na jumlisha 1 katika mamia.	$\begin{array}{r} 456\,736 \\ +\quad 13\,497 \\ \hline 33 \\ \hline \end{array}$
3. Jumlisha mamia: 1 + 7 + 4 = 12. Andika 2 katika nafasi ya mamia na jumlisha 1 katika maelfu.	$\begin{array}{r} 456\,736 \\ +\quad 13\,497 \\ \hline 233 \\ \hline \end{array}$
4. Jumlisha maelfu: 1 + 6 + 3 = 10. Andika 0 katika nafasi ya maelfu na jumlisha 1 katika makumi elfu.	$\begin{array}{r} 456\,736 \\ +\quad 13\,497 \\ \hline 0\,233 \\ \hline \end{array}$
5. Jumlisha makumi elfu: 1 + 5 + 1 = 7. Andika 7 katika nafasi ya makumi elfu.	$\begin{array}{r} 456\,736 \\ +\quad 13\,497 \\ \hline 70\,233 \\ \hline \end{array}$
6. Jumlisha mamia elfu: 4 + 0 = 4. Andika 4 katika nafasi ya mamia elfu. Kwa hiyo, jibu ni 470 233.	$\begin{array}{r} 456\,736 \\ +\quad 13\,497 \\ \hline 470\,233 \\ \hline \end{array}$

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Mfano wa 3

```
   192 574
+    3 648
----------
   196 222
```

Zoezi la 5

Jibu maswali yafuatayo:

1.
```
  856 956
+ 134 689
---------
```

2.
```
   88 456
+ 134 689
---------
```

3.
```
  489 765
+  94 538
---------
```

4.
```
  324 857
+ 143 073
---------
```

5.
```
  708 924
+  79 989
---------
```

6.
```
  889 900
+  73 281
---------
```

7.
```
  454 899
  378 716
+ 120 102
---------
```

8.
```
  818 819
+  71 719
---------
```

9.
```
  834 532
+ 134 068
---------
```

10.
```
   40 546
+ 221 768
---------
```

11.
```
  679 448
  298 765
+   1 000
---------
```

12.
```
  489 660
+ 427 488
---------
```

13.
```
  507 609
  382 517
+  13 170
---------
```

14.
```
  779 988
+  78 866
---------
```

15.
```
   24 454
+ 138 457
---------
```


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16.
```
  679 884
+ 243 029
---------

---------
```

17.
```
  666 777
+ 112 990
---------

---------
```

18.
```
  488 574
+ 433 126
---------

---------
```

19.
```
  884 007
+ 107 994
---------

---------
```

20.
```
  555 666
  111 000
  200 234
+  32 152
---------

---------
```

Mafumbo ya kujumlisha namba

Mfano wa 1

Kiwanda cha kusindika nyama kilinunua ng'ombe 137 527 mwaka juzi na ng'ombe 222 062 mwaka jana. Kiwanda hicho kilinunua ng'ombe wangapi kwa miaka yote miwili?

Njia

Idadi ya ng'ombe mwaka juzi	137 527
Idadi ya ng'ombe mwaka jana	+ 222 062
Jumla ya ng'ombe	359 589

Kiwanda kilinunua jumla ya ng'ombe 359 589.

Mfano wa 2

Malori matatu yalibeba maembe kama ifuatavyo:
Lori la kwanza maembe 225 768, la pili maembe 19 435 na la tatu maembe 22 202. Malori yote yalibeba maembe mangapi?

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Njia

Lori la kwanza maembe		225 768
Lori la pili maembe		19 435
Lori la tatu maembe	+	22 202
Jumla		267 405

Malori yote yalibeba jumla ya maembe 267 405.

Zoezi la 6

Jibu maswali yafuatayo:

1. Tafuta jumla ya watu katika kata zifuatazo:
   Mgori ina watu 216 819, Mhonda ina watu 258 776 na Balangida ina watu 126 000.
2. Hango anazo shilingi 830 900. Ikiwa amepewa mkopo wa shilingi 160 550 na benki, je, ana jumla ya shilingi ngapi?
3. Wilaya ya Handeni ina miche ya miti 561 217 na Wilaya ya Manyoni ina miche ya miti 393 888. Kuna jumla ya miche mingapi katika Wilaya hizo?
4. Iwapo Maktaba ya Mkoa wa Dodoma ina vitabu 678 213 na Maktaba ya Mkoa wa Mbeya ina vitabu 298 994. Tafuta jumla ya vitabu katika maktaba hizo.
5. Wanafunzi waliojiunga na kidato cha tano mwaka 2015 ni 65 123, mwaka 2016 ni wanafunzi 87 112 na mwaka 2017 ni wanafunzi 98 430. Tafuta jumla ya wanafunzi waliojiunga na kidato cha tano kwa miaka hiyo mitatu.
6. Wakulima walivuna mazao kama ifuatavyo:
   Maharage magunia 216 997, Mahindi magunia 230 000,

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Alizeti magunia 340 775. Je, wakulima hao walivuna jumla ya magunia mangapi ya mazao hayo?

7. Iwapo ranchi ya Taifa Kongwa ina ng'ombe 483 125 na ranchi ya Taifa Sagara ina ng'ombe 375 166, tafuta jumla ya ng'ombe katika ranchi zote mbili.

8. Mkoa wa Njombe ulivuna mbao 713 128 na Mkoa wa Iringa ulivuna mbao 280 193. Mikoa hiyo ilivuna jumla ya mbao ngapi?

9. Shule ya Msingi Jamhuri ina madawati 2 588, Shule ya Msingi Mwanga ina madawati 8 813 na Shule ya Msingi Mihayo ina madawati 10 554. Je, shule hizo zina jumla ya madawati mangapi?

10. Kampuni ilinunua magari 491 235 kwa fedha taslimu na kukopeshwa magari 508 761. Je, kampuni ilipata jumla ya magari mangapi?

Zoezi la 7

Jibu maswali yafuatayo:

1. 431 635 + 200 163 =
2. 888 887 + 66 677 =

3.
```
   777 784
 + 112 241
 _________
 _________
```

4.
```
   989 999
 +   1 492
 _________
 _________
```

5.
```
   666 666
 + 332 113
 _________
 _________
```

6. 244 444 + 677 555 =
7. 213 + 56 334 + 700 451=

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8.
```
   405 306
+  379 908
```

9.
```
   244 726
+  339 493
```

10.
```
   340 045
+   35 975
```

11.
```
   453 659
+  546 341
```

12.
```
   467 438
+    6 005
```

13. 134 560 + 53 975 =

14. 243 489 + 452 007 =

15.
```
   355 325
+  241 023
```

16.
```
   389 535
+    1 003
```

17. 7 840 + 63 450 + 220 006 =

18. 19 610 + 40 133 + 20 223 =

19.
```
   723 461
   126 873
+  138 912
```

20. 566 780 + 11 002 + 300 054 =

21. Kijiji cha Pohama kilikuwa na kuku 98 214 na kijiji cha Mazae kilikuwa na kuku 415 999. Je, vijiji hivyo vilikuwa na jumla ya kuku wangapi?

22. Shangazi ana kiasi cha shilingi 168 000. Ikiwa alipewa mkopo na mwajiri wake shilingi 90 000. Je, ana jumla ya shilingi ngapi?

23. Mfugaji aliuza kuku akapata shilingi 400 000. Pia, aliuza mbuzi akapata shilingi 500 000. Jumla alipata shilingi ngapi?

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24. Mkoa wa Mwanza uliuza tani 304 301 za pamba. Mkoa wa Shinyanga uliuza tani 532 175 za pamba. Je, mikoa yote miwili iliuza tani ngapi za pamba?

25. Baba alinunua runinga kwa shilingi 689 000, cherehani kwa shilingi 150 000 na baiskeli kwa shilingi 160 000. Je, alilipa jumla ya shilingi ngapi?

Jikumbushe

1. Unapojumlisha namba, panga tarakimu katika mpangilio wa wima au ulalo. Anza kujumlisha mamoja, makumi, mamia, maelfu, makumi elfu, mamia elfu na kuendelea.
2. Unapojumlisha namba, anza tarakimu za kulia kuelekea kushoto.
3. Unapofumbua mafumbo;
   (a) Tafsiri maelezo kupata tendo litakalotumika.
   (b) Chambua maelezo kupata hesabu inayohusika.
   (c) Baada ya kukokotoa, rejea swali na jibu swali kwa maneno.

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Sura ya Tatu

Kutoa namba

Katika Darasa la Nne, ulijifunza kutoa namba zenye tarakimu hadi tano bila kuchukua na kwa kuchukua. Vilevile, ulijifunza kufumbua mafumbo yanayohusu kutoa namba nzima. Katika sura hii, utajifunza kutoa namba zenye tarakimu hadi sita bila kuchukua na kwa kuchukua. Pia, utaendelea kujifunza mafumbo yanayohusu kutoa namba.

Zoezi la 1: Marudio

Jibu maswali yafuatayo:

1. 68 549 – 25 127 =

2. 73 458 – 32 135 =

3. 92 406 – 1 304 =

4. 62 694 – 30 521 =

5. 62 345 – 4 672 =

6. 81 505 – 61 426 =

7. 92 914 – 67 083 =

8. 79 461 – 2 330

9. 72 345 – 12 204

10. 87 910 – 45 710

11. 55 423 – 5 211

12. 63 348 – 1 419

13. 12 467 – 11 448

14. 54 678 – 47 629

15. 78 934 – 69 983

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16. Yohana alikuwa na kiasi cha shilingi 98 550 benki. Ikiwa alichukua shilingi 12 400 kwa ajili ya kununua viatu, je, Yohana alibakiwa na shilingi ngapi benki?
17. Wakazi wa kijiji cha Songambele walipanda miti 75 620. Iwapo miti 3 210 iliungua moto, miti mingapi haikuungua?
18. Wanafunzi 89 777 walifanya mtihani wa darasa la nne. Wanafunzi 2 899 hawakufaulu. Wanafunzi wangapi walifaulu mtihani huo?
19. Wafugaji wa kijiji cha Maendeleo walikuwa na jumla ya ng'ombe 25 495. Iwapo ng'ombe 16 726 waliuzwa, ng'ombe wangapi hawakuuzwa?
20. Mama Miriamu alikuwa na shilingi 57 000. Alitaka kununua runinga inayogharimu shilingi 75 000. Alipungukiwa shilingi ngapi?

Kutoa namba bila kuchukua

Kutoa namba kwa mpangilio wa ulalo

Mfano wa 1

257 645 – 34 413 =

Hatua:

1. Toa mamoja: 5 – 3 = 2. Andika 2 katika nafasi ya mamoja.	257 645 – 34 413 = _ _ _ _ _ 2
2. Toa makumi: 4 – 1 = 3. Andika 3 katika nafasi ya makumi.	257 645 – 34 413 = _ _ _ _ 32
3. Toa mamia: 6 – 4 = 2. Andika 2 katika nafasi ya mamia.	257 645 – 34 413 = _ _ _ 232

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4. Toa maelfu: 7 – 4 = 3.
Andika 3 katika nafasi ya maelfu. 257 645 – 34 413 = _ _ 3 232

5. Toa makumi elfu:
5 – 3 = 2. Andika 2 katika nafasi ya makumi elfu. 257 645 – 34 413 = _ 23 232

6. Toa mamia elfu:
2 – 0 = 2. Andika 2 katika nafasi ya mamia elfu. 257 645 – 34 413 = 223 232

Kwa hiyo, 257 645 – 34 413 = 223 232.

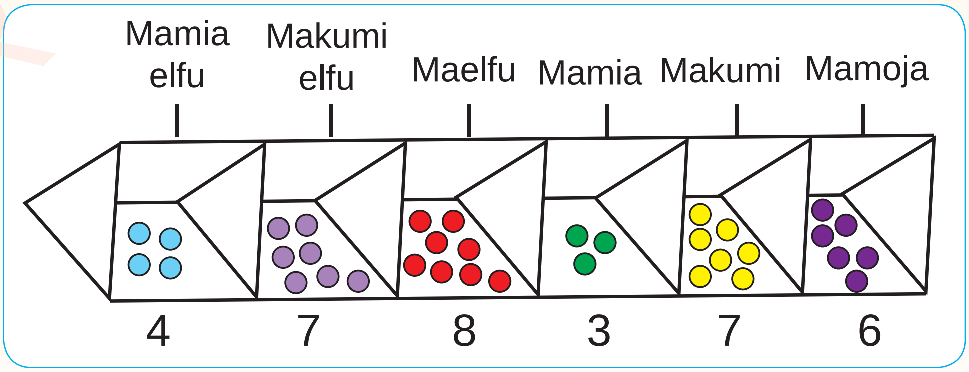
Mfano wa 2

478 376 – 255 142 =

Hatua:

Kujibu swali kwa kutumia sinia la kuhesabia namba.

1. Tumia tarakimu za namba inayotoa namba nyingine, 478 376. Weka vihesabio katika sinia la kuhesabia namba kulingana na thamani ya tarakimu. Weka vihesabio 6 katika mamoja, 7 katika makumi, 3 katika mamia, 8 katika maelfu, 7 katika makumi elfu na 4 katika mamia elfu.



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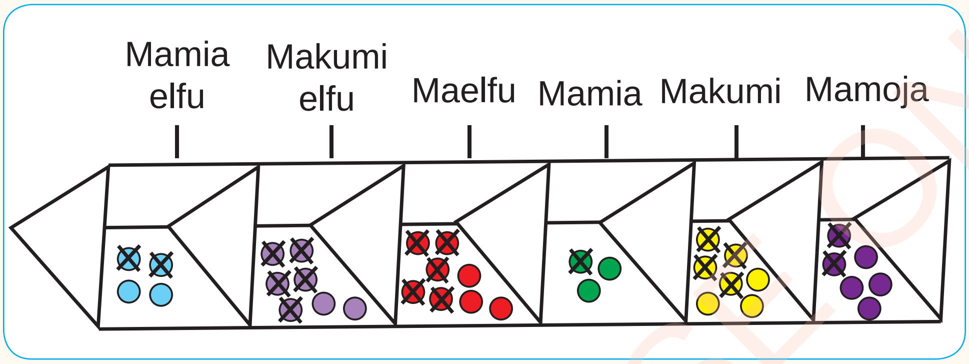
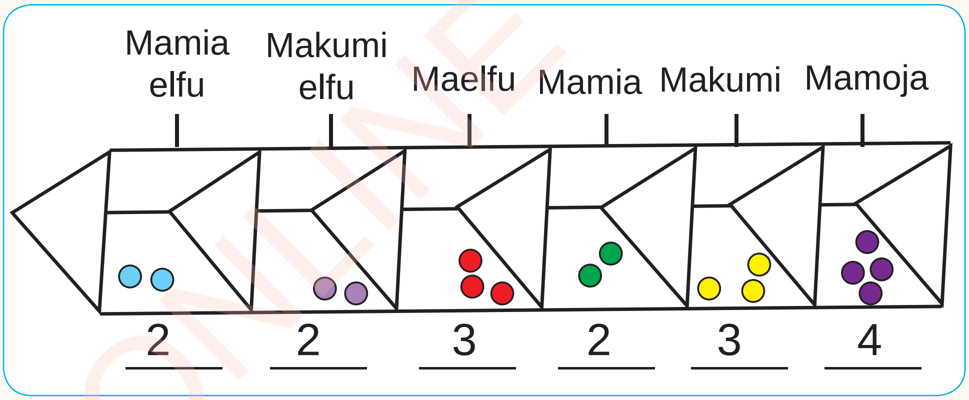
2. Kwa kuwa tendo ni kutoa, punguza vihesabio kwa kuzingatia thamani ya tarakimu ya namba inayotolewa, 255 142. Kwenye mchoro huu vihesabio vyenye alama ya X ni tarakimu zinazotolewa.



3. Andika idadi ya vihesabio vilivyobaki kulingana na thamani ya tarakimu.



Kwa hiyo, 478 376 – 255142 = 223 234.

Mfano wa 3

643 270 – 541 240 = 102 030

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Zoezi la 2

Jibu maswali yafuatayo:

1. 153 652 – 41 331 =
2. 889 998 – 664 322 =
3. 706 605 – 602 303 =
4. 824 335 – 13 112 =
5. 623 440 – 2 010 =
6. 753 872 – 641 631 =
7. 568 237 – 18 113 =
8. 995 698 – 12 254 =
9. 156 789 – 130 000 =
10. 425 310 – 213 110 =
11. 524 885 – 112 432 =
12. 357 603 – 223 402 =
13. 654 235 – 232 113 =
14. 115 752 – 15 231 =
15. 788 500 – 501 000 =
16. 534 728 – 134 617 =
17. 399 728 – 188 314 =
18. 496 623 – 285 413 =
19. 247 568 – 113 254 =
20. 524 804 – 103 501 =

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Kutoa namba kwa mpangilio wa wima

Mfano wa 1

$$\begin{array}{r} 457\ 234 \\ -\ 134\ 102 \\ \hline \\ \hline \end{array}$$

Hatua:

1. Toa mamoja: 4 – 2 = 2. Andika 2 katika nafasi ya mamoja.

$$\begin{array}{r} 457\ 234 \\ -\ 134\ 102 \\ \hline 2 \\ \hline \end{array}$$

2. Toa makumi: 3 – 0 = 3. Andika 3 katika nafasi ya makumi.

$$\begin{array}{r} 457\ 234 \\ -\ 134\ 102 \\ \hline 32 \\ \hline \end{array}$$

3. Toa mamia: 2 – 1 = 1. Andika 1 katika nafasi ya mamia.

$$\begin{array}{r} 457\ 234 \\ -\ 134\ 102 \\ \hline 132 \\ \hline \end{array}$$

4. Toa maelfu: 7 – 4 = 3. Andika 3 katika nafasi ya maelfu.

$$\begin{array}{r} 457\ 234 \\ -\ 134\ 102 \\ \hline 3\ 132 \\ \hline \end{array}$$

5. Toa makumi elfu: 5 – 3 = 2. Andika 2 katika nafasi ya makumi elfu.

$$\begin{array}{r} 457\ 234 \\ -\ 134\ 102 \\ \hline 23\ 132 \\ \hline \end{array}$$

6. Toa mamia elfu: 4 – 1 = 3. Andika 3 katika nafasi ya mamia elfu.

$$\begin{array}{r} 457\ 234 \\ -\ 134\ 102 \\ \hline 323\ 132 \\ \hline \end{array}$$

Kwa hiyo, 457 234 – 134 102 ni 323 132.

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Mfano wa 2

$$\begin{array}{r} 463\ 257 \\ -\ 221\ 125 \\ \hline \\ \hline \end{array}$$

Njia

	Mamia elfu	Makumi elfu	Maelfu	Mamia	Makumi	Mamoja
	4	6	3	2	5	7
	– 2	2	1	1	2	5
7 – 5						2
50 – 20					3	0
200 – 100				1	0	0
3 000 – 1 000			2	0	0	0
60 000 – 20 000		4	0	0	0	0
400 000 – 200 000	2	0	0	0	0	0
	2	4	2	1	3	2

Kwa hiyo jibu ni 242 132.

Au kwa njia ya moja kwa moja

$$\begin{array}{r} 463\ 257 \\ -\ 221\ 125 \\ \hline 242\ 132 \\ \hline \end{array}$$

Mfano wa 3

$$\begin{array}{r} 649\ 283 \\ -\ 34\ 162 \\ \hline 615\ 121 \\ \hline \end{array}$$

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Zoezi la 3

Jibu maswali yafuatayo:

1. 652 451 − 331 041 = ______
2. 826 666 − 714 232 = ______
3. 527 238 − 20 014 = ______
4. 237 972 − 112 451 = ______
5. 823 574 − 1 230 = ______
6. 912 345 − 810 212 = ______
7. 587 645 − 335 243 = ______
8. 353 821 − 141 711 = ______
9. 734 726 − 512 413 = ______
10. 789 235 − 227 122 = ______
11. 773 002 − 521 001 = ______
12. 315 241 − 111 131 = ______
13. 632 541 − 11 231 = ______
14. 825 789 − 13 578 = ______
15. 127 834 − 114 321 = ______
16. 953 275 − 132 143 = ______
17. 483 255 − 351 013 = ______
18. 517 599 − 414 328 = ______
19. 889 659 − 64 236 = ______
20. 172 637 − 41 332 = ______

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Kutoa namba kwa kuchukua

Kutoa namba kwa mpangilio wa ulalo

Mfano wa 1

981 746 – 274 272 =

Hatua:

1. Toa mamoja:
   6 – 2 = 4. Andika 4 katika nafasi ya mamoja.
   981 746 – 274 272 = _ _ _ _ _ 4

2. Toa makumi: 4 – 7 haiwezekani. Chukua mamia 1 kutoka mamia 7, badili kuwa makumi kisha jumlisha: 10 + 4 = 14. Hivyo, 14 – 7 = 7. Andika 7 katika nafasi ya makumi.
   981 746 – 274 272= _ _ _ _ 74

3. Yamebaki mamia 6. Toa mamia: 6 – 2 = 4. Andika 4 katika nafasi ya mamia.
   981 746 – 274 272 = _ _ _ 474

4. Toa maelfu: 1 – 4 haiwezekani. Chukua fungu 1 la makumi elfu libadili kuwa maelfu kisha jumlisha: 10 + 1 = 11. Hivyo, 11 – 4 = 7. Andika 7 katika nafasi ya maelfu.
   981 746 – 274 272 = _ _ 7 474

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5. Yamebaki makumi elfu 7.
Toa makumi elfu: 7 – 7 = 0. Andika 0 katika nafasi ya makumi elfu.

981 746 – 274 272 = _ 07 474

6. Toa mamia elfu: 9 – 2 = 7.
Andika 7 katika nafasi ya mamia elfu.

981 746 – 274 272 = 707 474

Kwa hiyo, 981 746 – 274 272 = 707 474.

Mfano wa 2

634 207 – 253 478 = 380 729

Zoezi la 4

Jibu maswali yafuatayo:

1. 864 624 – 25 206 =
2. 685 378 – 123 553 =
3. 938 765 – 737 846 =
4. 748 760 – 144 690 =
5. 992 478 – 966 257 =
6. 998 897 – 669 999 =
7. 576 788 – 2 899 =
8. 534 609 – 514 799 =
9. 947 842 – 88 847 =
10. 979 988 – 79 999 =
11. 479 149 – 288 601 =
12. 398 694 – 296 498 =
13. 754 382 – 289 =
14. 990 000 – 90 270 =

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15. 319 728 – 187 379 =

16. 489 756 – 298 587 =

17. 156 742 – 137 833 =

18. 567 810 – 369 523 =

19. 246 483 – 137 552 =

20. 615 807 – 326 675 =

Kutoa namba kwa mpangilio wa wima

Mfano wa 1	Mfano wa 2	Mfano wa 3
756 456	560 947	537 902
– 484 417	– 67 328	– 449 651
272 039	493 619	88 251

Zoezi la 5

Jibu maswali yafuatayo:

1. 854 623 – 24 205

2. 664 378 – 123 453

3. 928 765 – 726 847

4. 148 760 – 145 619

5. 678 246 – 76 254

6. 999 898 – 769 979

7. 996 788 – 239 879

8. 964 234 – 78 927

9. 167 897 – 56 908

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10. 624 573 − 468 786 = ______

11. 367 129 − 135 237 = ______

12. 409 530 − 357 142 = ______

13. 800 000 − 222 075 = ______

14. 650 124 − 236 745 = ______

15. 461 385 − 172 843 = ______

16. 555 073 − 396 164 = ______

17. 562 782 − 389 351 = ______

18. 853 076 − 68 684 = ______

19. 785 438 − 90 900 = ______

20. 295 745 − 276 836 = ______

Mafumbo ya kutoa namba

Mfano wa 1

Kiwanda hutengeneza chupa 789 828 kila siku. Kutokana na hitilafu ya umeme, siku moja walitengeneza chupa 537 014 tu. Je, chupa ngapi hazikutengenezwa siku hiyo?

Njia

Chupa zinazotengenezwa kwa siku ni 789 828.

Chupa zilizotengenezwa ni 537 014.

789 828 – 537 014 = 252 814

Hivyo, chupa 252 814 hazikutengenezwa kwa siku hiyo.

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Mfano wa 2

Watu 678 520 walipimwa macho katika hospitali mbalimbali. Iwapo watu 382 140 walikuwa na matatizo ya macho, je, watu wangapi hawakuwa na matatizo ya macho?

Njia

Idadi ya watu waliopimwa macho ni 678 520.
Idadi ya watu waliokuwa na matatizo ya macho ni 382 140.

678 520 – 382 140 = 296 380

Hivyo, idadi ya watu ambao hawakuwa na matatizo ya macho ni 296 380.

Zoezi la 6

Jibu maswali yafuatayo:

1. Wanafunzi 635 740 walifanya mtihani wa kumaliza darasa la saba. Kati ya hao wavulana walikuwa 312 520. Je, wasichana wangapi walifanya mtihani huo?
2. Idadi ya watu waliopata chanjo katika mkoa wa Singida ni 796 599. Iwapo idadi ya wanawake waliopata chanjo ilikuwa 396 479, je wanaume wangapi walipata chanjo?
3. Kiwanda kilizalisha lita 572 895 za mafuta ya alizeti. Ikiwa lita 351 453 ziliuzwa, lita ngapi za mafuta ya alizeti hazikuuzwa?
4. Kiwanda cha chuma kilitengeneza nondo 763 264 katika wiki ya kwanza. Wiki ya pili kilitengeneza nondo 642 143 tu. Nondo ngapi zilipungua katika wiki ya pili?
5. Matofali 705 990 yalihitajika katika ujenzi wa kituo cha afya. Iwapo wanakijiji walifyatua matofali 504 550, ni matofali mangapi hayakufyatuliwa?

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6. Mshahara wa Muna ni shilingi 970 645 kwa mwezi. Ikiwa hutumia shilingi 98 850 kulipa kodi ya nyumba, je, Muna hubakiwa na shilingi ngapi kila mwezi?
7. Mashabiki 545 768 waliangalia shindano la mpira wa miguu kupitia runinga. Kati ya hao, wanawake walikuwa 213 554. Je, wanaume walikuwa wangapi?
8. Serikali ilipeleka magunia 560 780 ya mahindi katika mkoa wa Simiyu. Mahitaji ya mkoa yalikuwa magunia 625 800 ya mahindi. Magunia mangapi ya mahindi yalipungua?
9. Wanafunzi wa shule ya Sekondari Mwachonja walitumia lita 643 650 za maji katika mwezi Juni. Mwezi Julai walitumia lita 599 650 za maji. Walipunguza matumizi ya maji kwa lita ngapi?
10. Katika Mkoa wa Arusha, ng'ombe 780 558 walipigwa chapa. Iwapo mkoa mzima una ng'ombe 978 445, ng'ombe wangapi hawakupigwa chapa?
11. Bei ya tairi nne za gari ni shilingi 745 000. Iwapo Agnes ana shilingi 680 500 tu, anapungukiwa na kiasi gani cha fedha ili kuweza kununua tairi hizo nne?
12. Ushuru uliokusanywa katika soko la Kilombero siku ya Jumatatu ulikuwa shilingi 855 600. Shilingi 678 450 zilikusanywa siku ya Jumanne. Je, Jumanne makusanyo yalipungua kwa kiasi gani ukilinganisha na Jumatatu?

Zoezi la 7

Jibu maswali yafuatayo:

1. 280 000 – 17 000 =
2. 586 424 – 343 315 =
3. 748 869 – 26 879 =
4. 892 135 – 72 013 =
5. 966 617 – 134 215=
6. 873 977 – 762 582 =

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7. 538 993 – 429 926 =

8. 969 897 – 2 672 =

9. 672 354 – 51 132 =

10. 554 732 – 318 472 =

11. 826 592 – 648 257 =

12. 487 925 – 35 725 =

13. 289 355 – 199 264 =

14. 999 999 – 1 285 =

15. 278 914 – 18 288 =

16. 586 424 – 343 315 =

17. 697 415 – 28 928 =

18. 892 135 – 72 013 =

19. 842 316 – 145 820 =

20. 423 450 – 230 004 =

21. 897 050 – 530 478 =

22.
```
  167 898
–  12 378
---------
```

23.
```
  987 025
–  35 012
---------
```

24.
```
  873 977
– 762 582
---------
```

25.
```
  504 040
– 139 012
---------
```

26.
```
  567 893
– 125 698
---------
```

27.
```
  761 405
– 234 503
---------
```

28. Shule 10 zina mahitaji ya madaftari 175 038. Iwapo wafadhili walitoa madaftari 10 750, je, shule hizo zina upungufu wa madaftari mangapi?

29. Chama cha ushirika kilifyatua matofali 287 891 kati ya mahitaji ya matofali 482 674. Ni matofali mangapi hayakufyatuliwa?

30. Mkoa wa Kilimanjaro ulipanda miti 988 000 katika maeneo mbalimbali. Iwapo miti 798 000 ilistawi vizuri, je, miti mingapi haikustawi vizuri?

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31. Fundi alilipwa shilingi 845 750 kwa ujenzi wa choo cha shule. Iwapo gharama za ufundi zilikuwa shilingi 974 500, je, zilipungua shilingi ngapi kukamilisha malipo yake?

32. Tanki la maji hujaa lita 905 700 kwa siku moja. Iwapo matumizi ya maji kwa siku huwa ni lita 700 478, lita ngapi za maji hubakia katika tanki hilo kwa siku moja?

33. Shule ina mradi wa ufugaji wa kuku. Faida inayopatikana kwa mwaka ni shilingi 745 850. Iwapo shilingi 420 500 hutumika kununulia vifaranga kwa mwaka, shule hubakiwa na kiasi gani cha fedha kwa mwaka?

34. Chuo kilitumia kilowati 797 800 za umeme kwa miezi mitatu. Iwapo kwa miezi mingine mitatu kilitumia kilowati 580 730. Ni kiasi gani cha umeme kilipungua kulinganisha na miezi mitatu ya awali?

35. Mwaka jana, Wilaya ya Kilosa iliandikisha watoto 345 730 kujiunga na Darasa la Kwanza. Watoto 2 320 waliripotiwa kuwa watoro. Ni watoto wangapi walibaki shuleni?

Jikumbushe

1. Unapotoa namba, panga tarakimu katika mpangilio wa ulalo au wima.
2. Katika kutoa namba; toa tarakimu kwa kuanzia mamoja, makumi, mamia, maelfu, makumi elfu, mamia elfu na kuendelea.
3. Unapofumbua mafumbo;
   (a) Tafsiri maelezo kupata tendo litakalotumika.
   (b) Chambua maelezo kupata hesabu inayohusika.
   (c) Baada ya kukokotoa, rejea swali na andika jibu kwa maneno.

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4. Unapotoa tarakimu kubwa kutoka tarakimu ndogo, angalia tarakimu iliyo kushoto kwa ile tarakimu ndogo na chukua fungu 1. Badili fungu ulilochukua kuwa mamoja 10 au makumi 10 au mamia 10 au maelfu 10 au makumi elfu 10, kutegemeana na thamani ya tarakimu unayotoa. Ongeza kwenye ile tarakimu yenye thamani ndogo, kisha toa.
5. Unapotoa tarakimu kwa wima, zingatia kupanga namba kwa nafasi ya tarakimu, yaani mamoja chini ya mamoja; makumi chini ya makumi na kuendelea.

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Sura ya Nne

Kuzidisha namba

Katika Darasa la Nne, ulijifunza kuzidisha namba zenye tarakimu hadi tatu kwa namba zenye tarakimu hadi mbili. Katika sura hii, utajifunza kuzidisha namba kupata zao lisilozidi tarakimu sita. Pia, utaendelea kujifunza kufumbua mafumbo ya kuzidisha.

Zoezi la 1: Marudio

Jibu maswali haya.

1. $509 \times 1 =$
2. $243 \times 4 =$
3. $999 \times 9 =$
4. $541 \times 10 =$
5. $143 \times 50 =$
6. $172 \times 80 =$
7. $104 \times 100 =$
8. $312 \times 13 =$
9. $474 \times 15 =$
10. $616 \times 12 =$
11. 213×6
12. 237×9
13. 304×12
14. 472×16
15. 132×13
16. 322×12
17. 431×22
18. 250×14
19. 342×24

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20.
$$\begin{array}{r} 722 \\ \times \quad 14 \\ \hline \\ \hline \end{array}$$

21. Darasa la Tano lina wanafunzi 53. Mwalimu akimpa kila mwanafunzi kalamu 4, je, wanafunzi wote kwa pamoja watapata kalamu ngapi?

22. Ng'ombe mmoja hutoa lita 15 za maziwa kwa siku. Lita ngapi za maziwa zitapatikana kwa siku 100?

23. Magoma hufyatua matofali 220 kwa siku. Atafyatua matofali mangapi kwa muda wa siku 11?

24. Mkate mmoja huuzwa kwa shilingi 800. Ikiwa Johari atanunua mikate 46 ya aina hiyo, atalipa shilingi ngapi?

25. Furaha aliuza magunia 26 ya machungwa. Alipata shilingi ngapi iwapo bei ya gunia moja ilikuwa shilling 950?

26. Banda la kuku hujengwa kwa matofali 685. Je, mabanda 11 ya aina hiyo yatahitaji matofali mangapi?

27. Tafuta zao la namba 117 na 33.

28. Maembe 134 huchumwa kila siku. Je, maembe mangapi yatakuwa yamechumwa kwa siku 70?

29. Shamba la miti lina mistari 287 na kila mstari umepandwa miti 66. Je, shamba hilo lina miti mingapi?

30. Kiwanda hutengeneza sabuni 825 kwa saa moja. Iwapo kila sabuni huuzwa shilingi 50, je, kiwanda hicho kitapata shilingi ngapi kwa saa moja?

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Kuzidisha namba kwa kizidisho chenye tarakimu hadi mbili

Unapozidisha namba zingatia thamani ya tarakimu kwa kuanza kuzidisha namba kwa mamoja, makumi, mamia, maelfu, makumi elfu, mamia elfu na kuendelea.

Kuzidisha namba zenye tarakimu hadi nne kwa kizidisho chenye tarakimu hadi mbili

Mfano wa 1

278 × 13 =

Hatua:

Jibu linaweza kupatikana kwa njia ya ulalo kama ifuatavyo:

1. Zidisha 278 kwa mamoja 3; 278 × 3 = 834.
2. Zidisha 278 kwa makumi 1; 278 × 10 = 2 780.
3. Jumlisha jibu la hatua ya 1 na 2; 834 + 2 780 = 3 614.
   Hivyo, 278 × 13 = 3 614.

Pia, jibu linaweza kupatikana kwa njia ya wima kama ifuatavyo:

		Maelfu	Mamia	Makumi	Mamoja
			2	7	8
			×	1	3
3 × 8				2	4
3 × 70			2	1	0
3 × 200			6	0	0
10 × 8				8	0
10 × 70			7	0	0
10 × 200	+	2	0	0	0
		3	6	1	4

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Hii ni sawa na

		2	7	8
	×		1	3
		8	3	4
+	2	7	8	0
	3	6	1	4

Mfano wa 2

2 165 × 3 =

Njia

		Maelfu	Mamia	Makumi	Mamoja
		2	1	6	5
	×				3
3 × 5				1	5
3 × 60			1	8	0
3 × 100			3	0	0
3 × 2 000	+	6	0	0	0
		6	4	9	5

Pia, jibu linaweza kupatikana kwa njia fupi kama ifuatavyo:

	2	1	6	5
×				3
	6	4	9	5

Zoezi la 2

Jibu maswali haya.

1. 497 × 3 = **2.** 3 237 × 4 = **3.** 1 220 × 8 =

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4. 306 × 12 =	**5.** 511 × 15 =	**6.** 432 × 22 =
7. 281 × 59 =	**8.** 374 × 62 =	**9.** 721 × 28 =
10. 189 × 84 =	**11.** 4 156 × 78 =	**12.** 2 213 × 23 =
13. 1 332 × 21 =	**14.** 2 113 × 22 =	**15.** 3 122 × 13 =
16. 2 346 × 14 =	**17.** 3 334 × 25 =	**18.** 4 167 × 17 =
19. 1 324 × 18 =	**20.** 2 415 × 16 =	**21.** 3 217 × 23 =
22. 1 433 × 14 =	**23.** 2 246 × 27 =	**24.** 3 417 × 32 =
25. 1 619 × 43 =		

Kuzidisha namba zenye tarakimu hadi tano kwa kizidisho chenye tarakimu hadi mbili

Mfano wa 1

24 615 × 5 =

Njia

	Mamia elfu	Makumi elfu	Maelfu	Mamia	Makumi	Mamoja
		2	4	6	1	5
		×				5
5 × 5					2	5
5 × 10					5	0
5 × 600			3	0	0	0
5 × 4 000		2	0	0	0	0
5 × 20 000	+ 1	0	0	0	0	0
	1	2	3	0	7	5

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Hii ni sawa na;

	2	4	6	1	5
×					5
1	2	3	0	7	5

Mfano wa 2

```
    10 308
×       28
----------
    82 464
+ 206 160
----------
   288 624
```

Zoezi la 3

Jibu maswali yafuatayo:

1. 42 983 × 20 =

2. 53 490 × 14 =

3. 71 762 × 12 =

4. 33 768 × 24 =

5. 432 10 × 2 =

6. 63 281 × 15 =

7.
```
   21 423
×      23
---------

---------
```

8.
```
   32 247
×      12
---------

---------
```

9.
```
   41 165
×      21
---------

---------
```

10.
```
   36 792
×      11
---------

---------
```

11.
```
   20 081
×      24
---------

---------
```

12.
```
   23 414
×      32
---------

---------
```


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13. 53 249 × 13 = **14.** 30 167 × 20 = **15.** 20 070 × 28 =

16. 10 101 × 99 = **17.** 90 909 × 11 = **18.** 261 40 × 3 =

19. 33 004 × 2 = **20.** 30 874 × 3 =

Kuzidisha namba kwa kizidisho chenye hadi tarakimu tatu

Mfano wa 1

452 × 56 =

Njia

	Makumi elfu	Maelfu	Mamia	Makumi	Mamoja
			4	5	2
		×		5	6
6 × 2				1	2
6 × 50			3	0	0
6 × 400		2	4	0	0
50 × 2			1	0	0
50 × 50		2	5	0	0
50 × 400	+ 2	0	0	0	0
	2	5	3	1	2

au

		4	5	2
		×	5	6
	2	7	1	2
+ 2	2	6	0	0
2	5	3	1	2

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Mfano wa 2

$$\begin{array}{r} 276 \\ \times \quad 123 \\ \hline 828 \\ 5\,520 \\ +\ 27\,600 \\ \hline 33\,948 \\ \hline \end{array}$$

Zoezi la 4

Jibu maswali yafuatayo:

1. 109 × 125 =
2. 159 × 145 =
3. 255 × 204 =
4. 202 × 200 =
5. 227 × 200 =
6. 384 × 400 =
7. 608 × 32 =
8. 509 × 64 =
9. 919 × 251 =
10. 231 × 213 =
11. 411 × 124 =
12. 322 × 213 =
13. $\begin{array}{r} 109 \\ \times\ 241 \\ \hline \\ \hline \end{array}$
14. $\begin{array}{r} 413 \\ \times\ 142 \\ \hline \\ \hline \end{array}$
15. $\begin{array}{r} 521 \\ \times\ 132 \\ \hline \\ \hline \end{array}$
16. $\begin{array}{r} 236 \\ \times\ 242 \\ \hline \\ \hline \end{array}$
17. $\begin{array}{r} 346 \\ \times\ 244 \\ \hline \\ \hline \end{array}$
18. $\begin{array}{r} 422 \\ \times\ 142 \\ \hline \\ \hline \end{array}$
19. $\begin{array}{r} 714 \\ \times\ 102 \\ \hline \\ \hline \end{array}$
20. $\begin{array}{r} 812 \\ \times\ 242 \\ \hline \\ \hline \end{array}$

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Mafumbo ya kuzidisha

Mfano

Sanduku moja la soda lina chupa 24. Je, masanduku 5 624 ya soda yatakuwa na chupa ngapi za soda?

Njia

Idadi ya masanduku ni 5 624.

Sanduku 1 lina chupa 24.

$$\begin{array}{r} 5\,624 \\ \times \quad 24 \\ \hline 22\,496 \\ +\ 112\,480 \\ \hline 134\,976 \\ \hline \end{array}$$

Hivyo, masanduku 5 624 yana chupa 134 976.

Zoezi la 5

Jibu maswali yafuatayo:

1. Kiwanda cha nguo hutengeneza meta 654 za nguo kwa siku. Je, kwa siku 23 kiwanda kitatengeneza meta ngapi za nguo?
2. Doti moja ya kitenge ni shilingi 30 500. Je, nitalipa shilingi ngapi nikinunua doti 8 za vitenge?
3. Gari lina uwezo wa kuchukua mifuko 629 ya saruji kwa safari moja. Iwapo litafanya safari 65 litakuwa limechukua mifuko mingapi ya saruji?
4. Kitabu kina mistari 6 285 ya maneno. Ikiwa kila mstari una maneno 14, je, kitabu hicho kina maneno mangapi?
5. Namba ipi ni kubwa zaidi kati ya 531× 6 au 351× 7?

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6. Mwalimu aliwaagiza wanafunzi 258 wakusanye vijiti 122 kila mmoja. Je, wote walikusanya vijiti vingapi?
7. Maria aliuza kuku 66 kwa shilingi 15 000 kila mmoja. Je, aliuza kuku wote kwa shilingi ngapi?
8. Mafundi 136 walifyatua matofali 40 kila mmoja. Je, mafundi wote walifyatua matofali mangapi?
9. Baraka huuza kilogramu 2 560 za nyama kwa siku. Je, atauza kilogramu ngapi kwa siku 31?
10. Tanki la maji lina ujazo wa lita 2 500 za maji. Iwapo kuna matanki 83 ya ujazo huo, yote yatakuwa na ujazo wa lita ngapi?
11. Behewa moja la gari moshi lina uwezo wa kuchukua abiria 98. Mabehewa 35 ya aina hiyo yanaweza kuchukua abiria wangapi?
12. Wanafunzi 1 260 wa Shule ya Msingi Juhudi walipewa miti 35 kila mmoja kwa ajili ya kupanda kwenye eneo la shule. Je, wanafunzi wote walipanda miti mingapi?

Zoezi la 6

Jibu maswali yafuatayo:

1. 234 × 5 =
2. 528 × 7 =
3. 28 987 × 6 =
4. 133 × 10 =
5. 265 × 60 =
6. 741 × 100 =
7. $\begin{array}{r} 723 \\ \times \quad 6 \\ \hline \\ \hline \end{array}$
8. $\begin{array}{r} 308 \\ \times \quad 11 \\ \hline \\ \hline \end{array}$
9. $\begin{array}{r} 407 \\ \times \quad 206 \\ \hline \\ \hline \end{array}$

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10. $\begin{array}{r} 615 \\ \times \ 33 \\ \hline \\ \hline \end{array}$ **11.** $\begin{array}{r} 3\,434 \\ \times \ 25 \\ \hline \\ \hline \end{array}$ **12.** $\begin{array}{r} 2\,131 \\ \times \ 22 \\ \hline \\ \hline \end{array}$

13. $\begin{array}{r} 114 \\ \times \ 142 \\ \hline \\ \hline \end{array}$ **14.** $\begin{array}{r} 2\,005 \\ \times \ 23 \\ \hline \\ \hline \end{array}$ **15.** $\begin{array}{r} 1\,623 \\ \times \ 22 \\ \hline \\ \hline \end{array}$

16. $\begin{array}{r} 723 \\ \times \ 6 \\ \hline \\ \hline \end{array}$ **17.** $\begin{array}{r} 33\,407 \\ \times \ 28 \\ \hline \\ \hline \end{array}$ **18.** $\begin{array}{r} 52\,743 \\ \times \ 13 \\ \hline \\ \hline \end{array}$

19. 327 381 × 3 = **20.** 33 333 × 3 = **21.** 9 605 × 9 =

22. 624 × 531 = **23.** 750 × 750 =

24. Namba ipi ni kubwa zaidi kati ya 587 × 23 au 416 × 29?

25. Kibiriti kimoja kina njiti 50. Vibiriti 167 vya aina hiyo vina njiti ngapi?

Jikumbushe

1. Unapozidisha, zingatia thamani ya tarakimu kwa kuzidisha namba kwa mamoja, makumi, mamia, maelfu, makumi elfu, mamia elfu na kuendelea.
2. Katika mafumbo ya kuzidisha, tafsiri maelezo ili kupata hesabu inayohusika.
3. Namba yoyote ikizidishwa kwa sifuri jibu ni sifuri.

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Sura ya Tano

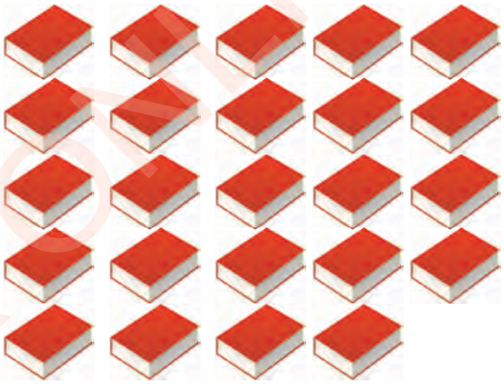
Kugawanya namba

Katika Darasa la Nne, ulijifunza kugawanya namba zenye tarakimu hadi tatu kwa kigawanyo chenye tarakimu hadi mbili. Katika sura hii, utajifunza kugawanya namba isiyozidi milioni moja kwa kigawanyo kisichozidi tarakimu tatu bila baki. Pia, utagawanya namba zenye tarakimu hadi tatu kwa vigawanyo vyenye tarakimu hadi mbili na baki.

Zoezi la 1: Marudio

Jibu maswali yafuatayo:

1. Panga vitabu vifuatavyo kwenye mafungu sita yenye idadi sawa.



Je, kila fungu lina vitabu vingapi?

2. Pipi 18 ziligawanywa sawa kwa watoto 3. Je, kila mtoto alipata pipi ngapi?

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3. Ukigawanya maparachichi 28 katika mafungu 14 yaliyo na idadi sawa, kila fungu litakuwa na maparachichi mangapi?

4. $125 \div 5 =$ 5. $96 \div 3 =$

6. $7\overline{)532}$ 7. $85\overline{)850}$ 8. $27\overline{)243}$

9. Shule moja ya msingi ina wanafunzi 240 na madarasa 12. Iwapo idadi ya wanafunzi ni sawa kwa kila darasa, je, kila darasa lina wanafunzi wangapi?

10. Bei ya pipi 15 ni shilingi 300. Tafuta bei ya pipi moja.

Tumia njia ya kutoa kwa kujirudia kujibu swali la 11 na 12.

11. $20 \div 4 =$ 12. $50 \div 10 =$

Kugawanya namba bila baki

Unapogawanya namba jawabu unalopata huitwa hisa. Namba inayogawanywa huitwa kigawanye na ile inayotumiwa kugawanya huitwa kigawanyo. Kwa mfano;

$$2522 \div 97 = 26$$

Katika mfano huu, 2522 inaitwa kigawanye, 97 ni kigawanyo na 26 ni hisa.

Kugawanya kwa njia ndefu

Kugawanya kwa njia ndefu, panga kigawanye, kigawanyo, na hisa kama ifuatavyo:

$$\begin{array}{r} \text{Hisa} \\ \text{Kigawanyo}\overline{)\text{Kigawanye}} \end{array}$$

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Mfano wa 1

$$32\overline{)14496}$$

Hatua:

1. Gawanya 14 kwa 32, haiwezekani. Chukua 144 kisha gawanya kwa 32 unapata 4. Andika 4 juu ya mamia.

$$\begin{array}{r} 4 \\ 32\overline{)14496} \end{array}$$

2. Zidisha 4 na 32 kupata 128. Andika 128 chini ya 144, kisha toa.

$$\begin{array}{r} 4 \\ 32\overline{)14496} \\ \underline{-128} \\ 16 \end{array}$$

3. Shusha 9 kwenye 16 kupata 169. Gawanya 169 kwa 32, unapata 5. Andika 5 juu ya makumi.

$$\begin{array}{r} 45 \\ 32\overline{)14496} \\ \underline{-128\downarrow} \\ 169 \end{array}$$

4. Zidisha 5 na 32 kupata 160. Andika 160 chini ya 169 kisha toa.

$$\begin{array}{r} 45 \\ 32\overline{)14496} \\ \underline{-128\downarrow} \\ 169 \\ \underline{-160} \\ 9 \end{array}$$

5. Shusha 6 kwenye 9 kupata 96. Gawanya 96 kwa 32, unapata 3. Andika 3 juu ya mamoja.

$$\begin{array}{r} 453 \\ 32\overline{)14496} \\ \underline{-128} \\ 169 \\ \underline{-160\downarrow} \\ 96 \end{array}$$

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6. Zidisha 3 na 32 kupata 96. Andika 96 chini ya 96 kisha toa.

```
     453
32)14496
  – 128
     169
   – 160
      96
    – 96
       0
```

Kwa hiyo, 32)14496 jibu ni 453.

Mfano wa 2

696)561672

Hatua:

1. Gawanya 561 kwa 696, haiwezekani. Chukua 5616 kisha gawanya 5616 kwa 696 unapata 8. Andika 8 juu ya mamia.

```
        8
696)561672
```

2. Zidisha 8 na 696, unapata 5568. Andika 5568 chini ya 5616, kisha toa.

```
        8
696)561672
   – 5568
       48
```

3. Shusha 7 katika 48, unapata 487. Gawanya 487 kwa 696, haiwezekani. Andika 0 juu ya makumi.

```
        80
696)561672
   – 5568↓
       487
```

4. Zidisha 0 na 696, unapata 0. Andika 0 chini ya 487 kisha toa.

```
        80
696)561672
   – 5568
       487
     – 000
       487
```


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5. Shusha 2 kwenye 487, unapata 4872. Gawanya 4872 kwa 696, unapata 7. Andika 7 juu ya mamoja.

$$\begin{array}{r} 807 \\ 696\overline{)561672} \\ -\,5568 \\ \hline 487 \\ -\,000 \\ \hline 4872 \end{array}$$

6. Zidisha 7 na 696, unapata 4872. Andika 4872 chini ya 4872, kisha toa.

$$\begin{array}{r} 807 \\ 696\overline{)561672} \\ -\,5568 \\ \hline 487 \\ -\,000 \\ \hline 4872 \\ -\,4872 \\ \hline 0 \\ \hline \end{array}$$

Kwa hiyo, $696\overline{)561672}$ jibu ni 807.

Mfano wa 3

$980\overline{)978040}$

Njia

$$\begin{array}{r} 998 \\ 980\overline{)978040} \\ -\,8820 \\ \hline 9604 \\ -\,8820 \\ \hline 7840 \\ -\,7840 \\ \hline 0 \\ \hline \end{array}$$

Kwa hiyo, $980\overline{)978040}$ jibu ni 998.

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Zoezi la 2

Jibu maswali yafuatayo:

1. 7)49000	**2.** 10)29190	**3.** 25)505000
4. 909)32724	**5.** 43)26789	**6.** 364)22932
7. 791)88592	**8.** 75)28950	**9.** 200)980000
10. 33)110979	**11.** 20)81520	**12.** 36)726984
13. 364)942032	**14.** 800)100000	**15.** 623)26789
16. 781)82005	**17.** 63)204687	**18.** 303)188163
19. 99)678249	**20.** 444)447996	

Kugawanya kwa njia fupi

Unapogawanya namba kwa njia fupi kigawanye, kigawanyo, na hisa hupangwa kama ifuatavyo:

Kigawanyo) Kigawanye
　　　　　　Hisa

Mfano wa 1

2)84620

Hatua:

1. Anza kugawanya kigawanye kutoka kushoto kuelekea kulia. Makumi elfu 8 gawanya kwa 2, unapata makumi elfu 4. Andika 4 chini ya makumi elfu.

2)84620
　4

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2. Gawanya maelfu 4 kwa 2, unapata maelfu 2. Andika 2 chini ya maelfu.

$$2\overline{)84620}$$
42

3. Gawanya mamia 6 kwa 2, unapata mamia 3. Andika 3 chini ya mamia.

$$2\overline{)84620}$$
423

4. Gawanya makumi 2 kwa 2, unapata makumi 1. Andika 1 chini ya makumi.

$$2\overline{)84620}$$
4231

5. Gawanya mamoja 0 kwa 2, unapata mamoja 0. Andika 0 chini ya mamoja.

$$2\overline{)84620}$$
42310

Kwa hiyo, $2\overline{)84620}$ jibu ni 42310.

Mfano wa 2

$$23\overline{)14260}$$

Hatua:

1. Gawanya 14 kwa 23, haiwezekani. Chukua 142 kisha igawanye kwa 23, unapata 6. Andika 6 chini ya mamia. Zidisha 6 na 23, unapata 138, halafu toa 142 – 138 = 4.

$$23\overline{)14260}$$
6 baki 4

2. Weka mamia 4 pamoja na makumi 6, unapata makumi 46, kisha gawanya 46 kwa 23, unapata makumi 2. Andika 2 chini ya makumi.

$$23\overline{)14260}$$
62

3. Gawanya 0 kwa 23, unapata 0. Andika 0 chini ya mamoja.

$$23\overline{)14260}$$
620

Kwa hiyo, $23\overline{)14260}$ jibu ni 620.

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Mfano wa 3

312500 ÷ 125 = 2500

Zoezi la 3

Jibu maswali yafuatayo:

1. $2\overline{)8640}$ **2.** $9\overline{)36927}$ **3.** $7\overline{)56574}$

4. $100\overline{)89400}$ **5.** $25\overline{)10000}$ **6.** $60\overline{)66000}$

7. $13\overline{)15613}$ **8.** $605\overline{)55055}$ **9.** $101\overline{)26765}$

10. $10\overline{)356250}$ **11.** $956\overline{)203628}$ **12.** $213\overline{)202776}$

13. $543\overline{)29865}$ **14.** $150\overline{)354000}$ **15.** $78\overline{)23400}$

16. $26\overline{)118586}$ **17.** $926\overline{)77784}$ **18.** $87\overline{)82389}$

19. $164\overline{)513648}$ **20.** $442\overline{)195364}$

Tumia njia fupi kutafuta hisa katika swali la 21 hadi 32

21. 22033 ÷ 11 = **22.** 48800 ÷ 61 =

23. 307350 ÷ 45 = **24.** 164000 ÷ 820 =

25. 89089 ÷ 89 = **26.** 730800 ÷ 812 =

27. 380324 ÷ 476 = **28.** 156400 ÷ 230 =

29. 755480 ÷ 85 = **30.** 360000 ÷ 600 =

31. 331920 ÷ 922 = **32.** 32220 ÷ 45 =

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Kugawanya namba na kupata baki

Unapogawanya namba kigawanye huweza kugawanyika na kubaki. Kwa hiyo, hisa unayopata inakuwa na baki.

Kugawanya kwa njia ndefu

Mfano wa 1

$27\overline{)866}$

Njia

1. Gawanya 86 kwa 27, unapata 3. Andika 3 juu ya makumi.

$$\begin{array}{r} 3 \\ 27\overline{)866} \end{array}$$

2. Zidisha 3 na 27, unapata 81. Andika 81 chini ya 86 kisha toa, 86 – 81= 5.

$$\begin{array}{r} 3 \\ 27\overline{)866} \\ -\underline{81} \\ 5 \end{array}$$

3. Shusha mamoja 6 kwenye makumi 5 kupata 56. Gawanya 56 kwa 27, unapata 2. Andika 2 juu ya mamoja.

$$\begin{array}{r} 32 \\ 27\overline{)866} \\ -\underline{81} \\ 56 \end{array}$$

4. Zidisha 2 na 27, unapata 54. Andika 54 chini ya 56 kisha toa, 56 – 54 = 2.

$$\begin{array}{r} 32 \\ 27\overline{)866} \\ -\underline{81} \\ 56 \\ -\underline{54} \\ \underline{2} \end{array}$$

Baada ya kutoa imebaki 2.

Kwa hiyo, $27\overline{)866}$ jibu ni 32 baki 2.

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Mfano wa 2

$7\overline{)148}$

Njia

1. Gawanya 14 kwa 7, unapata 2. Andika 2 juu ya makumi.	$\begin{array}{r} 2 \\ 7\overline{)148} \end{array}$
2. Zidisha 2 na 7, unapata 14. Andika 14 chini ya 14 kisha toa, 14 – 14 = 0.	$\begin{array}{r} 2 \\ 7\overline{)148} \\ -\underline{14} \end{array}$
3. Shusha 8, kisha gawanya 8 kwa 7, unapata 1. Andika 1 katika mamoja.	$\begin{array}{r} 21 \\ 7\overline{)148} \\ -\underline{14} \\ 8 \end{array}$
4. Zidisha 1 na 7, unapata 7. Andika 7 chini ya 8 kisha toa, 8 – 7= 1.	$\begin{array}{r} 21 \\ 7\overline{)148} \\ -\underline{14} \\ 8 \\ -\underline{7} \\ \underline{1} \end{array}$

Kwa hiyo, $7\overline{)148}$ jibu ni 21 baki 1.

Zoezi la 4

Jibu maswali yafuatayo:

1. $6\overline{)467}$ **2.** $8\overline{)891}$ **3.** $5\overline{)327}$

4. $25\overline{)815}$ **5.** $90\overline{)405}$ **6.** $77\overline{)620}$

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7. $88\overline{)220}$	**8.** $43\overline{)267}$	**9.** $11\overline{)241}$
10. $58\overline{)494}$	**11.** $84\overline{)847}$	**12.** $34\overline{)120}$
13. $25\overline{)555}$	**14.** $60\overline{)786}$	**15.** $15\overline{)148}$
16. $11\overline{)139}$	**17.** $32\overline{)347}$	**18.** $14\overline{)535}$
19. $28\overline{)234}$	**20.** $38\overline{)234}$	

Kugawanya kwa njia fupi

Mfano wa 1

$6\big)\underline{82}$

Hatua:

1. Gawanya makumi 8 kwa 6, unapata 1 baki 2.	$6\big)\underline{82}$
2. Andika 1 chini ya 8, kisha weka makumi 2 iliyobaki pamoja na mamoja 2 inakuwa 22.	$6\big)\underline{82}$ 1
3. Gawanya 22 kwa 6, unapata 3 baki 4. Andika 3 chini ya 2 na weka baki 4 mbele ya 13.	$6\big)\underline{82}$ 13 baki 4

Kwa hiyo, $6\big)\underline{82}$ jibu ni 13 baki 4.

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Mfano wa 2

$12\overline{)573}$

Hatua:

1. Gawanya 5 kwa 12, haiwezekani. Chukua 57 kisha igawanye kwa 12, unapata 4 baki 9. Andika 4 chini ya 7 na weka makumi 9 iliyobaki pamoja na mamoja 3 kupata 93.

$$\begin{array}{r} 4 \\ 12\overline{)573} \end{array}$$

2. Gawanya 93 kwa 12, unapata 7 na baki 9. Andika 7 chini ya 3 na weka baki 9 mbele ya 47.

$$\begin{array}{r} 47 \text{ baki } 9 \\ 12\overline{)573} \end{array}$$

Kwa hiyo, $12\overline{)573}$ jibu ni 47 baki 9.

Mfano wa 3

$$\begin{array}{r} 67 \text{ baki } 8 \\ 10\overline{)678} \end{array}$$

Zoezi la 5

Jibu maswali yafuatayo:

1. $3\overline{)457}$	**2.** $5\overline{)99}$	**3.** $9\overline{)68}$
4. $22\overline{)938}$	**5.** $12\overline{)405}$	**6.** $10\overline{)644}$
7. $31\overline{)125}$	**8.** $70\overline{)982}$	**9.** $10\overline{)831}$
10. $16\overline{)401}$	**11.** $18\overline{)233}$	**12.** $30\overline{)857}$
13. $15\overline{)286}$	**14.** $80\overline{)751}$	**15.** $9\overline{)489}$
16. $11\overline{)383}$	**17.** $13\overline{)252}$	**18.** $24\overline{)457}$
19. $17\overline{)500}$	**20.** $65\overline{)536}$	

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Mafumbo ya kugawanya

Mfano wa 1

Wafugaji 13 waligawana kuku 1625 kwa idadi sawa. Je, kila mfugaji alipata kuku wangapi?

Njia

Idadi ya wafugaji ni 13.

Idadi ya kuku ni 1625.

Gawanya 1625 kwa 13, unapata 125.

Hivyo, kila mfugaji alipata kuku 125.

Mfano wa 2

Mwalimu aliwapatia wanafunzi 35 idadi sawa ya machungwa. Ikiwa alikuwa na machungwa 305, je, kila mwanafunzi alipata machungwa mangapi na mwalimu alibakiwa na machungwa mangapi?

Njia

Idadi ya machungwa 305.

Idadi ya wanafunzi 35.

305 ÷ 35 = 8 baki 25.

Kila mwanafunzi alipata machungwa 8.

Mwalimu alibakiwa na machungwa 25.

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Zoezi la 6

Jibu maswali yafuatayo:

1. Mchele wenye uzito wa kilogramu 133700 uligawiwa kwa usawa kwa familia 50 zilizokumbwa na mafuriko. Je, kila familia ilipata kilogramu ngapi za mchele?
2. Mbuzi 24 walinunuliwa kwa shilingi 446400. Je, kila mbuzi alinunuliwa kwa shilingi ngapi iwapo wote walinunuliwa kwa bei sawa?
3. Mwalimu aliwagawia wanafunzi 60 idadi sawa ya karatasi. Ikiwa alikuwa na karatasi 414, kila mwanafunzi alipata karatasi ngapi na mwalimu alibakiwa na karatasi ngapi?
4. Darasa la tano lenye wanafunzi 50 lilipewa zawadi ya shilingi 80000 baada ya kufanya vizuri kwenye mashindano ya mkoa. Ikiwa wanafunzi hao waligawana fedha hizo kwa kiasi sawa, kila mmoja alipata shilingi ngapi?
5. Vijiji 40 vilipewa magunia ya mahindi kwa idadi sawa. Ikiwa jumla ya magunia ya mahindi ilikuwa 955, kila kijiji kilipata magunia mangapi ya mahindi na mangapi yalibaki?
6. Mfanyabiashara alipata shilingi 492000 kwa kuuza jozi 41 za viatu. Iwapo kila jozi iliuzwa kwa bei sawa, kila jozi iliuzwa kwa shilingi ngapi?
7. Juliana alipata shilingi 720000 kwa kuuza machungwa. Ikiwa kila chungwa liliuzwa kwa bei ya shilingi 150, Juliana aliuza machungwa mangapi?
8. Vitabu 99000 viligawiwa katika shule 200 kwa idadi sawa. Je, kila shule ilipata vitabu vingapi?
9. Chaki 100800 zimefungashwa kwa idadi sawa katika makasha 700. Kila kasha lina chaki ngapi?

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10. Wanachama 24 wa chama cha ushirika walivuna mananasi 986. Iwapo waligawana mananasi hayo kwa idadi sawa, yalibaki mananasi mangapi?

11. Wanakijiji walichanga shilingi 325000 kwa ajili ya ujenzi wa choo cha shule. Iwapo kila mwanakijiji alichangia shilingi 500, wanakijiji wangapi walichanga mchango huo?

12. Kalamu 136890 ziligawiwa kwa wanafunzi 30 waliofanya vizuri zaidi katika mitihani ya Hisabati. Je, kila mwanafunzi alipata kalamu ngapi iwapo ziligawiwa kwa idadi sawa?

Zoezi la 7

Jibu maswali yafuatayo:

1. $32352 \div 16 =$
2. $170 \div 17 =$
3. $3069 \div 99 =$
4. $363600 \div 300 =$
5. $31\overline{)165}$
6. $760\overline{)174800}$
7. $90\overline{)405000}$
8. $998\overline{)558880}$
9. $95\overline{)344}$
10. $44\overline{)935}$
11. $55\overline{)868230}$
12. Bakari alipata shilingi 984000 kwa kuuza mananasi. Ikiwa kila nanasi liliuzwa kwa shilingi 820, je, aliuza mananasi mangapi?
13. Mwalimu Sara alipokea madaftari 508 kwa ajili ya darasa la kwanza. Iwapo aliwagawia wanafunzi 95 madaftari kwa idadi sawa, je, kila mmoja alipata madaftari mangapi na kubaki mangapi?

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14. Katika chati ifuatayo, baini namba zote zinazogawanyika kwa 8 bila baki:

560	360	124	270	600
94	70	80	208	40
12	63	30	188	120
54	190	49	250	72

Jikumbushe

1. Namba inayogawanywa huitwa kigawanye, ile inayotumiwa kugawanya huitwa kigawanyo na jawabu linalopatikana huitwa hisa.
2. Hisa inaweza kuwa na baki au isiwe na baki.
3. Katika kugawanya namba, anza kugawanya tarakimu za upande wa kushoto za kigawanye kuelekea kulia.
4. Unapogawanya namba, kigawanye huweza kuisha au kubaki.

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Sura ya Sita

Namba za Kirumi

Katika Darasa la Nne, ulijifunza kusoma na kuandika namba za Kirumi kuanzia I hadi L. Katika sura hii, utajifunza zaidi kusoma na kuandika namba za Kirumi kuanzia L hadi M, ambazo kwa namba za kawaida ni kuanzia 50 hadi 1 000.

Zoezi la 1: Marudio

Jibu maswali yafuatayo:

1. Andika namba hizi kwa maneno.

(a) X (b) XII (c) IV (d) III

(e) IX (f) XLIX (g) XXIX (h) XIII

(i) XXXVIII (j) XXX (k) XXXIX (l) XXIV

(m) XIX (n) VI (o) XXXIII

2. Andika namba zifuatazo kwa Kirumi.

(a) Ishirini (e) Hamsini

(b) Kumi na nane (f) Kumi na sita

(c) Ishirini na saba (g) Ishirini na tisa

(d) Arobaini na tano (h) Thelathini na moja

3. Andika namba zifuatazo kwa Kirumi.

(a) 12 (b) 46 (c) 37 (d) 40

(e) 50 (f) 18 (g) 47 (h) 21

(i) 34 (j) 43 (k) 26 (l) 32

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Namba za Kirumi L hadi C

Soma namba zifuatazo:

Namba za kawaida	50	60	70	80	90	100
Namba za Kirumi	L	LX	LXX	LXXX	XC	C
Namba kwa maneno	Hamsini	Sitini	Sabini	Themanini	Tisini	Mia moja

Namba I, X na C ni namba pekee za kirumi ambazo zikiandikwa kushoto mwa namba yenye thamani kubwa hupunguzwa na zikiandikwa kulia huongezwa. Namba hizi haziwezi kujirudia zikiandikwa kushoto kwa namba kubwa. Pia, namba hizi haziwezi kujirudia zaidi ya mara tatu kwa mfululizo zikiandikwa kulia kwa namba kubwa. Namba hizi kwa namba za kawaida ni 1, 10 na 100.

Mfano wa 1

Soma na andika namba zifuatazo kwa maneno.

(a) LXV

(b) LXXVI

Njia

(a) LXV: 50 + 10 + 5 = 65
Hivyo, namba LXV ni sitini na tano.

(b) LXXVI: 50 + 20 + 6 = 76
Hivyo, namba LXXVI ni sabini na sita.

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Mfano wa 2

Namba IV na IX zinawakilisha mamoja. Hivyo, namba hizo zikiandikwa mbele ya namba zenye thamani kubwa hujumlishwa.

Soma namba zifuatazo:

(a) XCIX: (100 – 10) + 9 = 90 + 9 = 99

Hivyo, namba XCIX ni tisini na tisa.

(b) LIV: 50 + 4 = 54

Hivyo, namba LIV ni hamsini na nne.

Mfano wa 3

Soma namba zifuatazo katika jedwali hili:

	Kirumi	Maneno	Kiarabu
1.	LV	Hamsini na tano	55
2.	LIX	Hamsini na tisa	59
3.	LXXXIX	Themanini na tisa	89
4.	LXXII	Sabini na mbili	72
5.	XCIX	Tisini na tisa	99
6.	LXIV	Sitini na nne	64
7.	LVIII	Hamsini na nane	58
8.	LXI	Sitini na moja	61
9.	LXXIII	Sabini na tatu	73
10.	LXXXV	Themanini na tano	85

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Zoezi la 2

Jibu maswali yafuatayo:

1. Soma na andika namba zifuatazo kwa maneno:

(a) LXVII (b) LII (c) LXIV (d) XCVI
(e) XCVIII (f) LXXVII (g) LXXXVII (h) LXXXII
(i) LXXIV (j) LXIII

2. Andika namba zifuatazo kwa Kirumi:

(a) 52 (f) Hamsini na moja
(b) 66 (g) Sitini na tatu
(c) 70 (h) Sabini na tano
(d) 81 (i) Themanini na nne
(e) 93 (j) Tisini na mbili

3. Panga namba zifuatazo kuanzia ndogo hadi kubwa
C, I, X, L, V, LXV, LXXXV, XCV, LV, LXXV.

4. Andika namba za Kirumi zinazokosekana katika mfululizo wa namba zifuatazo:
LXXX, ________, LXXXII, _______, LXXXIV, ________.

Namba za Kirumi C hadi D

Soma namba zifuatazo:

Namba za kawaida	100	200	300	400	500
Namba za Kirumi	C	CC	CCC	CD	D
Namba kwa maneno	Mia moja	Mia mbili	Mia tatu	Mia nne	Mia tano

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Mfano wa 1

Soma na andika namba zifuatazo kwa Kirumi:

(a) 205

(b) 362

Njia

(a) 205 = 200 + 5
Kwa Kirumi 200 ni CC na 5 ni V.

Hivyo, 205 kwa Kirumi ni CCV.

(b) 362 = 300 + 60 + 2
Kwa Kirumi 300 ni CCC, 60 ni LX na 2 ni II.

Hivyo, 362 kwa Kirumi ni CCCLXII.

Mfano wa 2

Soma na andika namba zifuatazo kwa maneno:

(a) CXVII

(b) CDXLVI

Njia

(a) CXVII: 100 + 10 + 5 + 2 = 117
Hivyo, namba CXVII ni mia moja kumi na saba.

(b) CDXLVI: (500 – 100) + (50 – 10) + 6 =
400 + 40 + 6 = 446

Hivyo, namba CDXLVI ni mia nne arobaini na sita.

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Mfano wa 3

Soma namba zifuatazo:

	Kirumi	Maneno	Kiarabu
1.	CIV	Mia moja na nne	104
2.	CXIX	Mia moja kumi na tisa	119
3.	CLXXVI	Mia moja sabini na sita	176
4.	CCXXII	Mia mbili ishirini na mbili	222
5.	CCCXLIII	Mia tatu arobaini na tatu	343
6.	CCXXV	Mia mbili ishirini na tano	225
7.	CCCXXXVIII	Mia tatu thelathini na nane	338
8.	CDXVII	Mia nne kumi na saba	417
9.	CCLIV	Mia mbili hamsini na nne	254
10.	CDXXXI	Mia nne thelathini na moja	431

Zoezi la 3

Jibu maswali yafuatayo:

1. Soma na andika namba zifuatazo kwa maneno.

(a) CCCXXX
(b) CCXIX
(c) CCXCII
(d) CLXIX
(e) CDXLVII

2. Andika kwa Kirumi.

(a) Mia nne arobaini na nne
(b) Mia tano
(c) Mia moja
(d) Mia mbili na tisa
(e) Mia tatu hamsini
(f) Mia moja kumi na tano
(g) Mia mbili na nane
(h) Mia tatu ishirini na saba
(i) Mia nne hamsini na nne
(j) Mia nne na sita

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3. Badili namba zifuatazo kuwa namba za Kirumi.

(a) 108 (b) 211 (c) 374 (d) 435 (e) 442

Namba za Kirumi D hadi M

Soma namba za Kirumi zifuatazo:

Namba za kawaida	Namba za Kirumi	Namba kwa Maneno
500	D	Mia tano
600	DC	Mia sita
700	DCC	Mia saba
800	DCCC	Mia nane
900	CM	Mia tisa
1000	M	Elfu moja

Mfano wa 1

Badili namba zifuatazo kuwa namba za kawaida:

(a) CMIX (b) DCCLXXIV

Njia

(a) CMIX: (1000 – 100) + 9
= 900 + 9
= 909

Hivyo, namba CMIX ni 909.

(b) DCCLXXIV: 500 + 100+ 100 + 50 +10 + 10 + 4
= 500 + 200 + 70 + 4
= 700 + 70 + 4
= 774

Hivyo, namba DCCLXXIV ni 774.

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Mfano wa 2

Soma namba zifuatazo:

	Namba za Kirumi	Namba kwa maneno	Namba za kawaida
1.	DXI	Mia tano kumi na moja	511
2.	DCCXCIX	Mia saba tisini na tisa	799
3.	DCLXXIV	Mia sita sabini na nne	674
4.	DCCC	Mia nane	800
5.	CMXXVII	Mia tisa ishirini na saba	927
6.	CMLXXXIV	Mia tisa themanini na nne	984
7.	CMXXXI	Mia tisa thelathini na moja	931
8.	DL	Mia tano hamsini	550
9.	DCCXVI	Mia saba kumi na sita	716
10.	DCCXXVIII	Mia saba ishirini na nane	728

Zoezi la 4

Jibu maswali yafuatayo:

1. Soma na andika namba zifuatazo kwa maneno:

(a) CMXC (b) DCCL

(c) CMXCVI (d) DLXXXIX

(e) DLXXVIII (f) DLXIV

(g) CMLXVIII (h) CMLXXI

(i) DCCLXV (j) CMLXX

(k) DCXCVII (l) CMXCVIII

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2. Andika kwa namba za Kirumi.

(a) Mia tatu ishirini na moja
(b) Mia saba na tisa
(c) Mia tano hamsini na nne
(d) Mia nane kumi na nane
(e) Mia tisa sabini na sita
(f) Mia nane hamsini na na tano
(g) Mia tisa themanini na saba
(h) Mia saba sabini na saba
(i) Mia tisa hamsini
(j) Mia tano hamsini na tano

Zoezi la 5

Jibu maswali yafuatayo:

1. Andika namba zifuatazo kwa maneno:

(a) CCCXIV (b) XCI (c) CCXCII
(d) CCXXIV (e) DCCI (f) DCCCIX
(g) DCCCLXXI (h) CMXCV (i) DXLVI
(j) XCIII

2. Karo alipewa kadi yenye namba XLV. Anna alipewa kadi yenye namba LXX.

(a) Kati ya Karo na Anna, nani alipewa kadi yenye namba kubwa zaidi?
(b) Andika namba ya kila kadi katika namba za kawaida.

3. Kadi mbili ziliandikwa namba zifuatazo; kadi ya kwanza ina namba DCVI, kadi ya pili ina namba CDXI.

(a) Kadi ipi ina namba kubwa zaidi ya nyingine?
(b) Andika namba ya kadi iliyoandikwa namba ndogo katika namba za kawaida.

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4. Andika namba zifuatazo kwa Kirumi.

(a) Mia saba
(b) Sabini na moja
(c) Tisini na tatu
(d) Mia mbili hamsini na nane
(e) Mia tano thelathini na tatu
(f) Mia sita tisini na sita
(g) Mia tatu themanini na mbili
(h) Mia nne ishirini na nane
(i) Mia tisa tisini na sita
(j) Mia mbili tisini na tisa

5. Andika namba zifuatazo kwa Kirumi.

(a) 21 (b) 12 (c) 32 (d) 700 (e) 66
(f) 311 (g) 435 (h) 660 (i) 808 (j) 934

Jikumbushe

1. Namba za msingi za Kirumi ni I, V, X, L, C, D na M.
2. Namba V, L na D haziwezi kupunguzwa katika namba nyingine.
3. Namba I, X na C zinaweza kutolewa kutoka namba nyingine. Hivyo,
   (a) I inaweza kupunguzwa katika V na X tu, mfano IV na IX.
   (b) X inaweza kupunguzwa katika L na C tu, mfano XL na XC.
   (c) C inaweza kupunguzwa katika D na M tu, mfano CD na CM.
4. Namba I, X na C zinaweza kuandikwa kwa kurudiwa zikiwa zimefuatana hadi mara tatu tu. Kwa mfano; III, XXX, na CCC.
5. Hakuna namba ya Kirumi inayowakilisha 0.

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Sura ya Saba

Aina za namba, vigawo na vigawe

Ulipokuwa Darasa la Kwanza hadi la Nne, ulijifunza kugawanya namba nzima na kupata hisa zisizo na baki au zenye baki. Katika sura hii utajifunza aina za namba ambazo ni namba shufwa, namba witiri na namba tasa. Vilevile, utajifunza vigawo na vigawe vya namba. Namba hizi utaweza kuzitumia katika kutafuta Kigawo Kikubwa cha Shirika (KKS) na Kigawe Kidogo cha Shirika (KDS) cha namba nzima.

Aina za namba

Namba za kuhesabia

Unapohesabu watu au vitu mbalimbali unaanza na 1 ikifuatiwa na 2, 3, 4, 5, . . . Namba hizi huitwa namba za kuhesabia.

Mfano wa 1

Orodhesha namba za kuhesabia kati ya 8 na 20.

Namba za kuhesabia kati ya 8 na 20 ni 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 na 19.

Namba nzima

Namba za kuhesabia zikianzia na sifuri unapata seti ya namba nzima. Seti ya namba nzima ni 0,1, 2, 3, 4, 5, 6, 7, 8, ….

Mfano wa 2

Orodhesha namba nzima tisa za mwanzo.

Namba hizo ni 0, 1, 2, 3, 4, 5, 6, 7 na 8.

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Namba shufwa, witiri na tasa

Unapoorodhesha namba za kuhesabia utabaini namba shufwa, witiri na tasa.

Shughuli ya 1: Kubaini namba shufwa

Hatua:

1. Orodhesha namba za kuhesabia kuanzia 1 hadi 12.

   Namba hizo ni 1, 2, 3, 4, 5, 6 , 7, 8, 9, 10, 11, 12.

2. Wakilisha namba kwa vihesabio.

Namba	1	2	3	4	5	6	7	8	9	10	11	12
Vihesabio	●	●●	●●●	●●●●	●●●●●	●●●●●●	●●●●●●●	●●●●●●●●	●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●●	●●●●●●●●●●●●

3. Panga mafungu ya vihesabio viwiliviwili katika kila namba na zungushia duara.

Namba	1	2	3	4	5	6	7	8	9	10	11	12
Vihesabio	●	(●●)	(●●) ●	(●●) (●●)	(●●) (●●) ●	(●●) (●●) (●●)	(●●) (●●) (●●) ●	(●●) (●●) (●●) (●●)	(●●) (●●) (●●) (●●) ●	(●●) (●●) (●●) (●●) (●●)	(●●) (●●) (●●) (●●) (●●) ●	(●●) (●●) (●●) (●●) (●●) (●●)

4. Namba zilizo na mafungu ya mbilimbili bila baki ni 2, 4, 6, 8, 10 na 12.

   Namba hizi ni namba shufwa ambazo ni 2, 4, 6, 8, 10 na 12.

   Hivyo, namba shufwa ni namba za kuhesabia zinazogawanyika kwa mbili bila baki.

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Mfano wa 1

Orodhesha namba shufwa zote zilizopo kati ya 17 na 33.

Namba shufwa zilizopo kati ya 17 na 33 ni **18**, **20**, **22**, **24**, **26**, **28**, **30** na **32**.

Mfano wa 2

Jaza namba shufwa nne zinazofuata katika mfululizo huu wa namba: 574, 572, 570, __, __, __, __.

Namba shufwa ni 574, 572, 570, <u>568</u>, <u>566</u>, <u>564</u> na <u>562</u>.

Zoezi la 1

1. Kwa kila kipengele orodhesha namba shufwa zote zilizopo kati ya:
   (a) 25 na 35. (b) 50 na 60. (c) 81 na 99.
2. Baini na andika namba shufwa zote zilizopo katika vipengele vifuatavyo:
   (a) 43, 52, 56, 59, 60.
   (b) 71, 78, 82, 83, 87.
   (c) 92, 97, 96, 98, 99.
3. Namba zipi kati ya hizi si namba shufwa?
   (a) 52, 55, 56, 57, 59, 60, 62.
   (b) 18, 33, 36, 37, 40, 58, 70.
4. Andika namba shufwa 3 zinazofuata katika mfuatano huu: 22, 24, 26, ______, ______, ______.
5. Kuna namba shufwa ngapi kati ya 45 na 63?

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6. Andika namba shufwa zote zinazogawanyika kwa 4 bila baki zilizopo kati ya 73 na 93.

7. Andika namba shufwa zinazokosekana katika mfululizo huu: 30, ____, 34, 36, _____, _____, 42, _____, 46.

Shughuli ya 2: Kubaini namba witiri

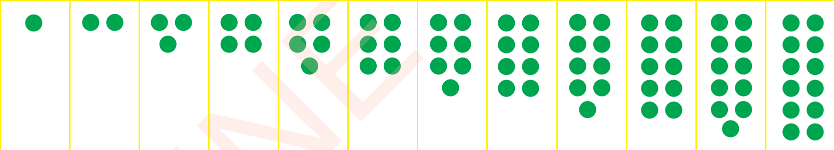
Hatua:

1. Orodhesha namba za kuhesabia 1 hadi 12.

   Namba hizi ni 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

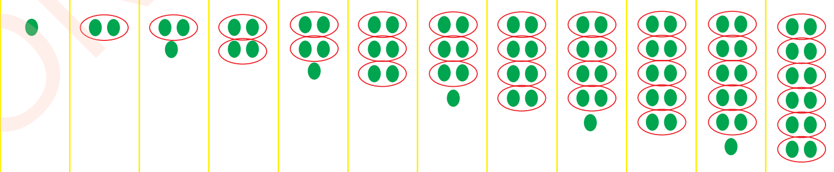
2. Panga vihesabio vyenye idadi sawa na thamani ya namba husika.

Namba	1	2	3	4	5	6	7	8	9	10	11	12
Vihesabio												



3. Panga mafungu ya vihesabio viwiliviwili katika kila namba na zungushia duara.

Namba	1	2	3	4	5	6	7	8	9	10	11	12
Vihesabio												



4. Katika hatua ya 3 utaona kuna namba ina kihesabio kimoja na nyingine zina mafungu ya vihesabio viwiliviwili na kubaki kihesabio kimoja. Namba hizi ni 1, 3, 5, 7, 9 na 11. Hivyo, namba 1, 3, 5, 7, 9 na 11 ni namba witiri.

   Namba witiri ni namba za kuhesabia ambazo hazigawanyiki kwa mbili.

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Mfano wa 1

Andika namba witiri zote zilizopo katika namba zifuatazo: 38, 49, 87, 96, 105, 254 na 281.

Namba witiri ni **49**, **87**, **105** na **281**.

Mfano wa 2

Andika namba witiri tatu zinazofuata katika mpangilio huu:

1003, 1005, 1005, ______, ______, ______.

Namba witiri ni 1003, 1005, 1007, 1009, 1011, 1013.

Zoezi la 2

Jibu maswali yafuatayo:

1. Kwa kutumia orodha ya namba zifuatazo:
4, 5, 8, 11, 13, 14, 16, 19, 21, 22, 25, 27, 29, 31, 32, 34, 35.
(a) Andika namba witiri zote.
(b) Andika namba witiri kati ya 8 na 22.

2. Andika namba witiri zinazokosekana katika mpangilio huu:
9, 11, 13, ___, 17, ___, ___, ___, 25, 27, ___, ___.

3. Katika namba za kuhesabia kumi za mwanzo, kuna namba witiri ngapi?

4. Jibu '**Ndiyo**' au '**Hapana**'.
(a) 243 ni namba witiri.__________
(b) Namba witiri ikijumlishwa na namba witiri jibu linakuwa namba shufwa. __________
(c) 2 018 ni namba witiri. __________
(d) 999 997 ni namba witiri. __________

5. Orodhesha namba witiri zote zinazogawanyika kwa 5 bila baki zilizopo kati ya 31 na 50.

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Shughuli ya 3: Kubaini namba tasa

Namba tasa zinaweza kubainishwa kwa kutumia vigawo.

Hatua:

1. Orodhesha namba za kuhesabia 1 hadi 100.

   Namba hizo ni,

   1, 2, 3, 4, 5, 6, 7, 8, 9, 10,
   11, 12, 13, 14, 15, 16, 17, 18, 19, 20,
   21, 22, 23, 24, 25, 26, 27, 28, 29, 30,
   31, 32, 33, 34, 35, 36, ... 100.

2. Zungushia duara namba 2 halafu weka alama X namba zote zinazogawanyika kwa 2.

3. Zungushia duara namba 3, halafu weka alama X namba zote zinazogawanyika kwa 3.

4. Zungushia duara namba 5, weka alama X namba zote zinazogawanyika kwa namba 5 ambazo hazijawekewa alama.

5. Zungushia duara namba 7, weka alama X namba zote zinazogawanyika kwa 7 ambazo hazijawekewa alama.

6. Zungushia duara namba 11, weka alama X namba zote zinazogawanyika kwa 11 ambazo hazijawekewa alama.

7. Andika namba zote zenye duara na ambazo hazina duara isipokuwa namba 1. Idadi ya namba hizo ni ishirini na tano.

   Namba hizo ni tasa ambazo ni 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89 na 97.

   Namba tasa ni namba za kuhesabia zinazogawanyika kwa moja na kwa zenyewe tu.

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Mfano wa 1

Orodhesha namba tasa zote ndogo kuliko 20.

Namba tasa zote ndogo kuliko 20 ni **2**, **3**, **5**, **7**, **11**, **13**, **17** na **19**.

Mfano wa 2

Andika namba tasa zote zilizopo kati ya 101 na 120 kwa kuzichambua namba.

Hatua:

1. Orodhesha namba zote kati ya 101 na 120 ambazo ni

   102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118 na 119.

2. Weka alama X namba zote zinazogawanyika kwa 2. Zitabaki 103, 105, 107, 109, 111, 113, 115, 117 na 119.
3. Weka alama X namba zote zinazogawanyika kwa 3. Zitabaki namba 103, 107, 109, 113 na 119.
4. Weka alama X namba zote zinazogawanyika kwa 5. Hakuna namba inayogawanyika kwa 5.
5. Weka alama X namba zote zinazogawanyika kwa 7. Zitabaki 103, 107, 109 na 113.

   Hivyo, namba tasa zilizopo kati ya 101 na 102 ni; 103, 107, 109 na 113.

Mfano wa 3

Andika namba tasa zilizopo katika namba hizi: 19, 21, 29, 37, 44, 45, 49, 51, 55, 57, 59.

Namba tasa ni **19**, **29**, **37** na **59**.

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Zoezi la 3

Jibu maswali yafuatayo:

1. Andika namba tasa zilizopo katika namba zifuatazo:

   4, 7, 10, 12, 13, 15, 16, 17.

2. Orodhesha namba tasa tatu zilizopo kati ya 14 na 25.

3. Chagua na andika namba tasa zote zilizopo katika orodha ifuatayo:

   123, 125, 127, 128, 130, 131, 135, 137, 138, 139, 142.

4. Andika namba tasa ambayo pia ni namba shufwa.

5. Andika idadi ya namba tasa zote zilizopo kati ya 10 na 20.

6. Kuna namba tasa ambayo nikitoa namba shufwa jibu lake ni sifuri. Hiyo namba tasa ni ipi?

7. Tafuta jumla ya namba tasa zote zilizopo kati ya 1 na 20.

8. Andika namba tasa zinazokosekana katika mfululizo huu: 31, _____, ____, _____, 47.

9. Andika namba tasa zote zilizopo katika orodha hii: 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94 na 95.

10. Andika **'kweli'** au **'si kweli'**
    (a) Namba witiri zote ni namba tasa. ___________
    (b) 2 ni namba tasa ndogo kuliko zote. ___________
    (c) 1, 2, 3, 4, 5 ni orodha ya namba tasa. ___________
    (d) 15 ni namba tasa. ___________
    (e) 1 ni namba tasa. ___________

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Vigawo vya namba

Kigawo cha namba ni namba inayogawanya namba husika bila baki. Wingi wa kigawo ni vigawo.

Mfano wa 1

Tafuta vigawo vyote vya 6.

Njia

Gawanya 6 kwa 1, 2, 3 na 6.

6 ÷ 1= 6,	6 ÷ 4 = 1 baki 2,
6 ÷ 2 = 3,	6 ÷ 5 = 1 baki 1,
6 ÷ 3 = 2,	6 ÷ 6 = 1.

Namba ambazo zinagawanya 6 bila baki ni 1, 2, 3 na 6.
Kwa hiyo, vigawo vyote vya 6 ni **1**, **2**, **3** na **6**.

Mfano wa 2

Orodhesha vigawo vyote vya 36 vinavyogawanyika kwa 2.

Njia

Gawanya 36 kwa 1, 2, 3, 4, 6, 9,12, 18, na 36 kama ifuatavyo:

36 ÷ 1 = 36,	36 ÷ 9 = 4,
36 ÷ 2 = 18,	36 ÷ 12 = 3,
36 ÷ 3 = 12,	36 ÷ 18 = 2,
36 ÷ 4 = 9,	36 ÷ 36 = 1.
36 ÷ 6 = 6,	

Namba zinazogawanya 36 bila baki ni 1, 2, 3, 4, 6, 9, 12, 18 na 36.

Vigawo vyote vya 36 ni 1, 2, 3, 4, 6, 9, 12, 18 na 36.

Kwa hiyo, vigawo vyote vya 36 vinavyogawanyika kwa 2 ni **2**, **4**, **6**, **12**, **18** na **36**.

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Mfano wa 3

Tafuta vigawo vyote vya 45.

Njia

Andika 45 kama zao la namba mbili kwa kutumia namba tofauti.

1 × 45 = 45, 1 na 45 ni vigawo vya 45.

3 × 15 = 45, 3 na 15 ni vigawo vya 45.

5 × 9 = 45, 5 na 9 ni vigawo vya 45.

Hivyo, vigawo vyote vya 45 ni **1**, **3**, **5**, **9**, **15** na **45**.

Vilevile, zao la namba linaweza kuhusisha vigawo zaidi ya viwili, kwa mfano:

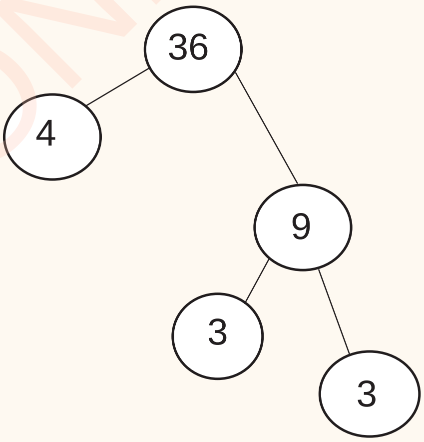
36 = 2 × 2 × 9.

Kwa namba hizi vigawo ni 2, 9 na 36.

Pia 36 inaweza kuandikwa, 36 = 3 × 3 × 4.

Kwa namba hizi vigawo ni **3**, **4** na **36**.

Pia, mchoro wa ngoe unaweza kutumika kuwakilisha vigawo vya namba.



Kwa kutumia mchoro wa ngoe, vigawo vilivyopo ni 3, 4, 9 na 36.

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Zoezi la 4

Jibu maswali yafuatayo:

1. Andika vigawo vyote vya namba zifuatazo:

(a) 20 (b) 7 (c) 12 (d) 5

2. Tafuta vigawo vyote vya namba zifuatazo:

(a) 8 (b) 16 (c) 24 (d) 49

(e) 10 (f) 81

3. Jaza kigawo kinachokosekana katika kisanduku:

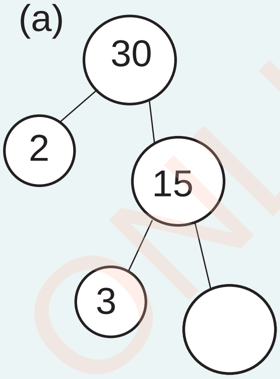
(a) $40 = 2 \times \square \times 5$ (b) $72 = 1 \times 2 \times 3 \times \square$

(c) $100 = 2 \times \square \times 10$ (d) $90 = 3 \times \square \times 6$

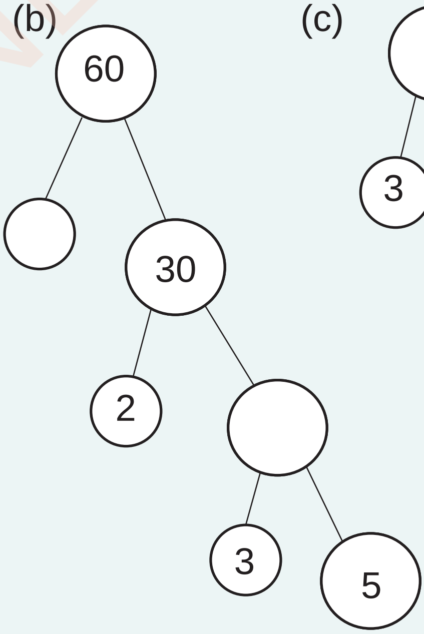
(e) $56 = \square \times 4 \times 7$

4. Jaza vigawo vinavyokosekana katika ngoe zifuatazo:

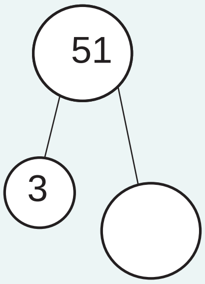
(a)



(b)



(c)



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Kutafuta vigawo vya namba kwa kutumia namba tasa

Namba tasa zinaweza kufafanuliwa kwa kutumia michoro.

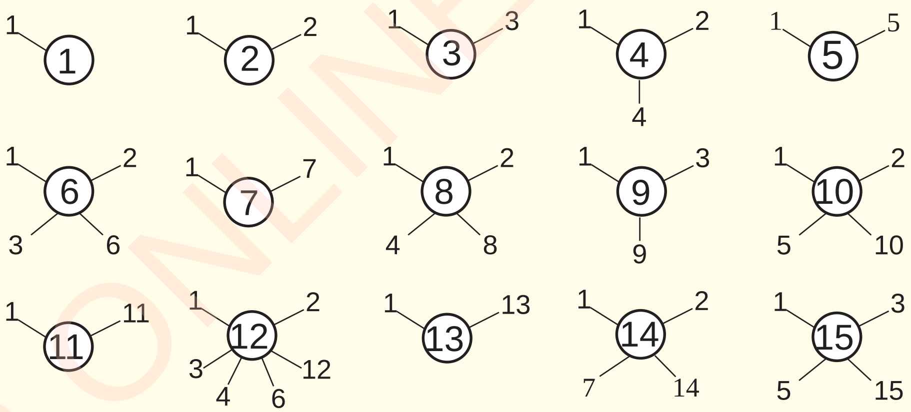
Shughuli ya 4:
Kubaini namba tasa kwa kutumia vigawo

Hatua:

1. Orodhesha namba za kuhesabia 1 hadi 15, kisha zungushia duara namba hizo.

   (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)
   (12) (13) (14) (15)

2. Andika vigawo vya kila namba na kuwakilisha vigawo hivyo kwenye matawi ya duara.



3. Orodhesha namba zilizo na matawi mawili tu, yaani zilizo na vigawo viwili tu.

   Namba hizo ni 2, 3, 5, 7, 11 na 13. Hizi namba kila moja ina vigawo viwili tu, ambavyo ni moja na namba yenyewe. Namba yenye vigawo viwili tu huitwa namba tasa.

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Zoezi la 5

Tafuta vigawo tasa vya namba zifuatazo:

(a) 12 (b) 28 (c) 15 (d) 24 (e) 14

Kigawo Kikubwa cha Shirika (KKS)

Kigawo Kikubwa cha Shirika ni kigawo kikubwa kabisa katika namba mbili au zaidi. Kifupisho cha Kigawo Kikubwa cha Shirika ni KKS.

Mfano wa 1

Tafuta vigawo vya shirika vya 6 na 8.

Hatua:

1. Orodhesha vigawo vya 6 na 8.
   Vigawo vya 6 ni 1, 2, 3 na 6.
   Vigawo vya 8 ni 1, 2, 4 na 8.
2. Vigawo vya shirika vya 6 na 8 ni 1 na 2.

Mfano wa 2

Tafuta KKS cha 30 na 42.

Hatua:

1. Orodhesha vigawo vya 30 na 42.
   Vigawo vya 30 ni 1, 2, 3, 5, 6, 10, 15 na 30.
   Vigawo vya 42 ni 1, 2, 3, 6, 7, 14, 21 na 42.
2. Vigawo vya shirika vya 30 na 42 ni 1, 2, 3 na 6.
3. Kigawo Kikubwa cha Shirika ni 6.
   Hivyo, KKS cha 30 na 42 ni 6.

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Mfano wa 3

Tafuta KKS cha 12 na 18 kwa kutumia vigawo tasa.

Njia

Kumbuka namba tasa ni 2, 3, 5, 7, 11, 13, 17, . . .

Andika 12 kwa kutumia vigawo tasa: 12 = 2 × 2 × 3.

Andika 18 kwa kutumia vigawo tasa: 18 = 2 × 3 × 3.

Hivyo, vigawo tasa vilivyopo katika namba zote ni 2 na 3.

Zao la 2 na 3 ni 6.

Kwa hiyo, KKS cha 12 na 18 ni 6.

Mfano wa 4

Tafuta KKS cha 24 na 60 kwa njia ya kugawanya kwa pamoja.

Njia

2	24	60	24 na 60 zinagawanyika kwa 2.
2	12	30	12 na 30 zinagawanyika kwa 2.
2	6	15	2 inagawanya 6 tu.
3	3	15	3 na 15 zinagawanyika kwa 3.
5	1	5	5 inagawanya 5.
	1	1	inapofikia 1 ni mwisho.

Namba zinazogawanya namba zote bila baki katika mtiririko huo ni 2, 2 na 3.

KKS cha 24 na 60 ni zao la 2, 2 na 3 ambalo ni 2 × 2 × 3 = 12.

Hivyo, KKS cha 24 na 60 ni 12.

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Zoezi la 6

Jibu maswali yafuatayo:

1. Kwa njia ya kuorodhesha, andika vigawo vya shirika vya namba zifuatazo:
   (a) 10 na 12 (d) 96 na 36 (g) 20 na 21
   (b) 8 na 16 (e) 42 na 72 (h) 18 na 45
   (c) 15 na 27 (f) 7 na 15 (i) 3 na 7

2. Tafuta KKS kwa kutumia vigawo tasa katika maswali yafuatayo:
   (a) 11 na 42 (d) 8 na 24 (g) 12 na 16
   (b) 15 na 20 (e) 4 na 8
   (c) 30 na 90 (f) 16 na 24

3. Tafuta KKS kwa njia ya ngoe:
   (a) 42 na 48 (b) 33 na 72
   (c) 72 na 144 (d) 75 na 80

4. Tafuta KKS cha namba zifuatazo kwa njia ya kugawanya kwa pamoja.
   (a) 23 na 5 (c) 24 na 180 (e) 36 na 162
   (b) 24 na 156 (d) 35 na 245

Vigawe vya namba

Namba yoyote ya kuhesabia inapozidishwa kwa namba nyingine ya kuhesabia, zao linalopatikana linaitwa kigawe. Wingi wa kigawe ni vigawe.

12 × 1 = 12; 12 ni kigawe cha 1 na 12.

12 × 2 = 24; 24 ni kigawe cha 2, 12 na 24.

12 × 3 = 36; 36 ni kigawe cha 3, 12 na 36.

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Tunaweza kuorodhesha vigawe vya namba kwa kutumia mifano ifuatayo:

Mfano wa 1

Andika vigawe vitano vya kwanza vya 2.

Njia

Ili kupata vigawe vya 2, zidisha 2 kwa 1, halafu zidisha 2 kwa 2, 3, 4 na 5 kama ifuatavyo:

$2 \times 1 = 2,$

$2 \times 2 = 4,$

$2 \times 3 = 6,$

$2 \times 4 = 8,$

$2 \times 5 = 10.$

Hivyo, vigawe vitano vya kwanza vya 2 ni 2, 4, 6, 8 na 10.

Vigawe vya 2 vyote vinagawanyika kwa 2 bila baki.

Mfano wa 2

Andika vigawe vya 5.

Njia

Ili kupata vigawe vya 5 zidisha 5 kwa 1 halafu zidisha 5 kwa 2, 3, 4, na kuendelea kama ifuatavyo:

$5 \times 1 = 5,$	$5 \times 4 = 20,$
$5 \times 2 = 10,$	$5 \times 5 = 25,$
$5 \times 3 = 15,$	$5 \times 6 = 30.$

Hivyo, vigawe vya 5 ni 5, 10, 15, 20, 25, . . .

Orodha ya vigawe haina mwisho isipokuwa kama umepewa kikomo.

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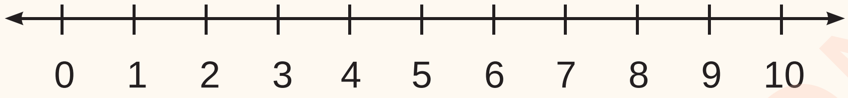
Mfano wa 3

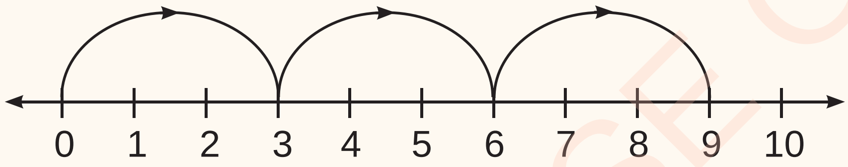
Tumia mstari wa namba kuonesha vigawe vya 3.

Hatua

1. Chora mstari wa namba.



2. Anzia kwenye 0 na ruka hatua tatutatu kuelekea kulia.

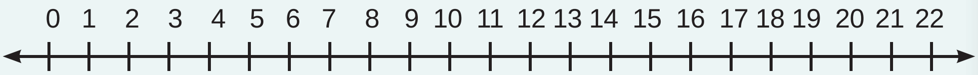


Hivyo, vigawe vya 3 ni 3, 6, 9, 12, 15, . . .

Zoezi la 7

Jibu maswali yafuatayo:

1. Andika vigawe vya 4 vyote vilivyopo kati ya 2 na 30.
2. Andika vigawe vya 11 vyote vilivyopo kati ya 9 na 45.
3. Andika vigawe kumi vya mwanzo vya 9.
4. Andika vigawe vya 7 vyote vilivyopo kati ya 45 na 100.
5. Orodhesha vigawe vyote vya namba zifuatazo visivyozidi 60.
   (a) 5 (b) 8 (c) 10 (d) 17
6. Orodhesha vigawe vyote vya 6 vilivyopo kati ya 5 na 62.
7. Chora mstari wa namba ufuatao kisha utumie kujibu maswali yanayofuata:



   (a) Zungushia duara vigawe vya 5.
   (b) Weka alama X kwenye vigawe vyote vya 2.
   (c) Orodhesha vigawe vitano vya mwanzo vya 1.

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Kigawe Kidogo cha Shirika (KDS)

Mfano wa 1

Orodhesha vigawe vya shirika vya 3 na 6.

Hatua:

1. Andika vigawe vya 3.
   Vigawe vya 3 ni 3, 6, 9, 12, 15, 18, 21, 24, . . .
2. Andika vigawe vya 6.
   Vigawe vya 6 ni 6, 12, 18, 24, 30, . . .
3. Chambua vigawe vya 3 ambavyo pia ni vigawe vya 6. Vigawe hivi ni 6,12, 18, 24...... Utapata vigawe zaidi ukiendelea kuorodhesha vigawe vya 3 na 6.

   Hivyo, vigawe vya shirika vya 3 na 6 ni 6, 12, 18, 24. . .

Mfano wa 2

Tafuta Kigawe Kidogo cha Shirika (KDS) cha 3 na 4.

Hatua:

1. Andika vigawe vya 3.
   Vigawe vya 3 ni 3, 6, 9, 12, 15, 18, 21, 24, 27 . . .
2. Andika vigawe vya 4.
   Vigawe vya 4 ni 4, 8, 12, 16, 20, 24, 28. . .
3. Vigawe vya shirika vya 3 na 4 ni 12, 24, . . .

   Hivyo, KDS cha 3 na 4 ni 12.

Kigawe Kidogo cha Shirika ni namba ndogo kabisa inayogawanyika kwa namba zinazohusika. Kifupisho cha Kigawe Kidogo cha Shirika ni KDS.

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Mfano wa 3

Tafuta KDS cha 12 na 20 kwa njia ya kugawanya kwa pamoja.

Hatua:

1.

2	12	20	12 na 20 zinagawanyika kwa 2
2	6	10	6 na 10 zinagawanyika kwa 2
3	3	5	3 inagawanya 3 tu lakini haigawanyi 5
5	1	5	5 inagawanya 5
	1	1	inapofikia 1 ni mwisho.

2. Kigawe Kidogo cha Shirika ni zao la $2 \times 2 \times 3 \times 5 = 60$
   Hivyo, KDS cha 12 na 20 ni 60.

Mfano wa 4

Tafuta KDS cha 8 na 30 kwa njia ya kugawanya kwa pamoja au ngazi.

Hatua:

1.

2	8	30
2	4	15
2	2	15
3	1	15
5	1	5
	1	1

2. Kigawe Kidogo cha Shirika cha 8 na 30 ni zao la
   $2 \times 2 \times 2 \times 3 \times 5 = 120$.
   Hivyo, KDS cha 8 na 30 ni 120.

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Zoezi la 8

Jibu maswali yafuatayo:

1. Orodhesha vigawe vyote vya 9 vilivyopo kati ya 20 na 60.

2. Andika vigawe vya 5 vilivyopo kati ya 30 na 47.

3. Orodhesha vigawe vya shirika vya 5, 8 na 20 vilivyopo kati ya 10 na 100.

4. Orodhesha vigawe vitano vya mwanzo vya namba zifuatazo:

(a) 6 (b) 35 (c) 13 (d) 24

5. Tafuta KDS cha namba zifuatazo:

(a) 5 na 7 (b) 12 na 40 (c) 8 na 12 (d) 6 na 13

6. Tafuta KDS kwa kutumia zao la vigawo tasa.

(a) 18 na 30 (b) 45 na 60 (c) 23 na 46
(d) 25 na 85 (e) 150 na 225 (f) 96 na 128

Zoezi la 9

1. Andika vigawo vyote kwa kila namba zifuatazo:
(a) 70 (b) 95 (c) 224 (d) 250 (e) 729

2. Andika vigawo tasa vya namba zifuatazo:
(a) 108 (b) 120 (c) 840

3. Andika vigawo vya shirika vya namba zifuatazo kwa kuorodhesha:
(a) 9 na 15 (b) 12 na 72 (c) 8 na 32

4. Tafuta vigawo vya shirika vya namba zifuatazo:
(a) 60 na 200 (b) 28 na 32

5. Orodhesha vigawe 8 vya kwanza vya namba zifuatazo:

(a) 7 (b) 9 (c) 13 (d) 20 (e) 34

6. Tafuta KDS cha 24 na 27 kwa njia ya kugawanya kwa pamoja.

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7. Orodhesha namba tasa zilizopo kati ya 30 na 40.

8. Andika aina ya namba inayopatikana katika kujumlisha:

(a) namba shufwa na namba shufwa

(b) namba witiri na namba shufwa

(c) namba witiri na namba witiri

9. Tafuta KKS cha jozi za namba zifuatazo:

(a) 8, 12 (b) 6, 18 (c) 14, 28 (d) 15, 30

10. Andika KDS cha jozi za namba zifuatazo:

(a) 2, 3 (b) 4, 6 (c) 7, 4 (d) 5, 7

11. Chora chati ya namba 1 hadi 100 na itumie kujibu maswali yafuatayo:

(a) Andika vigawe vya namba zifuatazo:

(i) 11 (ii) 29 (iii) 33

(b) Andika namba shufwa zilizopo kati ya 70 na 83.

(c) Andika namba tasa zilizopo kati ya 50 na 99.

(d) Andika namba witiri zilizopo kati ya 85 na 100.

Jikumbushe

1. Namba tasa ni namba yenye vigawo viwili tu ambavyo ni 1 na yenyewe.
2. Vigawo ni namba zinazogawa namba bila baki. Vigawe ni namba zinazogawanyika bila baki.
3. Kuna namba moja tu ambayo ni shufwa na pia ni tasa nayo ni 2.
4. Namba shufwa ni namba zinazogawanyika kwa 2.
5. Namba witiri ni namba zisizogawanyika kwa 2.

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Sura ya Nane

Sehemu

Katika Darasa la Nne, ulijifunza kujumlisha na kutoa sehemu zenye asili moja. Katika sura hii, utajifunza aina za sehemu, kulinganisha sehemu, kujumlisha sehemu zenye asili tofauti, kutoa sehemu zenye asili tofauti na kuzidisha sehemu. Pia, utaendelea kujifunza kufumbua mafumbo yenye dhana ya sehemu.

Zoezi la 1: Marudio

Jibu maswali yafuatayo:

1. $\frac{1}{3} + \frac{1}{3} =$
2. $\frac{6}{12} + \frac{5}{12} =$
3. $\frac{3}{8} + \frac{4}{8} =$
4. $\frac{5}{20} + \frac{11}{20} =$
5. $\frac{13}{17} + \frac{4}{17} =$
6. $\frac{4}{10} + \frac{1}{10} =$
7. $\frac{15}{35} - \frac{8}{35} =$
8. $\frac{9}{36} + \frac{12}{36} =$
9. $\frac{11}{53} + \frac{30}{53} =$
10. $\frac{5}{22} + \frac{9}{22} =$
11. $\frac{6}{20} - \frac{5}{20} =$
12. $\frac{25}{48} - \frac{13}{48} =$
13. $\frac{7}{13} - \frac{4}{13} =$
14. $\frac{30}{60} - \frac{20}{60} =$
15. $\frac{5}{7} - \frac{2}{7} =$
16. $\frac{15}{40} - \frac{8}{40} =$
17. $\frac{9}{19} - \frac{5}{19} =$
18. Nusu ya shamba imepandwa mahindi. Je, ni sehemu gani ya shamba hilo haikupandwa mahindi?

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19. Wanafunzi walipanda miche ya miti ya matunda. Iwapo $\frac{1}{4}$ ya miti yote ilikauka, sehemu gani ya miti ya matunda haikukauka?

20. Zawadi alitembea $\frac{4}{5}$ ya umbali wa safari yake. Ni sehemu gani ya umbali ilibaki?

21. Wanakijiji waliuza $\frac{3}{9}$ ya pamba yao kwenye Chama kimoja cha Ushirika na $\frac{4}{9}$ ya pamba yao kwenye Chama kingine. Je, wanakijiji waliuza sehemu gani ya pamba yao?

22. Maua alikula $\frac{1}{12}$ ya mkate na Amani alikula $\frac{3}{12}$ ya mkate huo. Wote kwa pamoja walikula sehemu gani ya mkate?

Aina za Sehemu

Sehemu zimegawanyika katika makundi mawili ambayo ni sehemu rahisi na sehemu guni.

(i) Sehemu rahisi ni zile ambazo asili ni kubwa kuliko kiasi. Baadhi ya mifano ya sehemu hizi ni;

$\frac{1}{4}, \frac{2}{4}, \frac{1}{9}, \frac{3}{8}, \frac{10}{12}, \frac{15}{40}.$

(ii) Sehemu guni ni zile ambazo kiasi ni kikubwa kuliko asili. Mifano ya sehemu hizi ni;

$\frac{6}{5}, \frac{9}{4}, \frac{10}{7}, \frac{11}{9}, \frac{12}{11}.$

Sehemu guni zikirahisishwa hutupatia namba mchanganyiko ambazo ni namba nzima na sehemu. Namba mchanganyiko ni kama; $3\frac{1}{2}, 4\frac{1}{2}, 5\frac{3}{4}, 15\frac{1}{4}, 22\frac{1}{3}.$

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Mfano

Kati ya sehemu $\frac{6}{9}$, $\frac{2}{3}$, $\frac{7}{2}$, $\frac{1}{3}$ na $\frac{9}{4}$, zipi ni:

(a) sehemu rahisi? (b) sehemu guni?

Jibu

(a) Sehemu rahisi ni $\frac{6}{9}$, $\frac{2}{3}$ na $\frac{1}{3}$.

(b) Sehemu guni ni $\frac{7}{2}$ na $\frac{9}{4}$.

Zoezi la 2

Jibu maswali yafuatayo:

1. Sehemu zipi kati ya hizi zifuatazo kiasi ni kikubwa kuliko asili?
   $\frac{3}{4}$, $\frac{10}{8}$, $\frac{1}{4}$, $\frac{9}{15}$, $\frac{20}{18}$, $\frac{16}{9}$.
2. Sehemu zipi kati ya hizi zifuatazo ni sehemu rahisi?
   $\frac{1}{6}$, $\frac{1}{7}$, $\frac{11}{6}$, $\frac{5}{4}$, $\frac{9}{10}$.
3. Nini tofauti kati ya sehemu rahisi na sehemu guni?

Sehemu zenye thamani sawa

Sehemu yoyote yenye kiasi sawa na asili, thamani yake ni 1.

Mfano wa 1

$$\frac{2}{2} = \frac{3}{3} = \frac{4}{4} = \frac{5}{5} = \frac{6}{6} = 1$$

Ukizidisha sehemu kwa 1, thamani yake haibadiliki.

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Mfano wa 2

Andika sehemu nyingine 4 zilizosawa na $\frac{1}{2}$.

Njia

$$\frac{1}{2} = \frac{1}{2} \times \frac{2}{2} = \frac{2}{4};$$

$$\frac{1}{2} = \frac{1}{2} \times \frac{3}{3} = \frac{3}{6};$$

$$\frac{1}{2} = \frac{1}{2} \times \frac{4}{4} = \frac{4}{8};$$

$$\frac{1}{2} = \frac{1}{2} \times \frac{5}{5} = \frac{5}{10};$$

Kwa hiyo, $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$.

Mfano wa 3

Andika sehemu nyingine 4 zilizosawa na $\frac{3}{4}$.

Njia

$$\frac{3}{4} = \frac{3}{4} \times \frac{2}{2} = \frac{6}{8};$$

$$\frac{3}{4} = \frac{3}{4} \times \frac{3}{3} = \frac{9}{12};$$

$$\frac{3}{4} = \frac{3}{4} \times \frac{4}{4} = \frac{12}{16};$$

$$\frac{3}{4} = \frac{3}{4} \times \frac{5}{5} = \frac{15}{20};$$

Kwa hiyo, $\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16} = \frac{15}{20}$.

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Zoezi la 3

Jibu maswali yafuatayo:

1. Orodhesha sehemu tatu za mwanzo zilizosawa na sehemu zifuatazo:

(a) $\frac{1}{7}$ (c) $\frac{1}{9}$ (e) $\frac{1}{4}$

(b) $\frac{1}{11}$ (d) $\frac{1}{15}$

2. Jaza nafasi zilizoachwa wazi:

(a) $\frac{1}{4}, \frac{2}{8},$ ____, $\frac{4}{16}$.

(b) $\frac{1}{8}, \frac{2}{16},$ ____, ____, $\frac{5}{40}$.

(c) $\frac{3}{5},$ ____, $\frac{9}{15},$ ____.

(d) $\frac{3}{16},$ ____, $\frac{9}{48}$.

3. Bainisha sehemu zote zenye thamani sawa kati ya hizi zifuatazo:

$\frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{25}{100}, \frac{2}{16}, \frac{3}{18}.$

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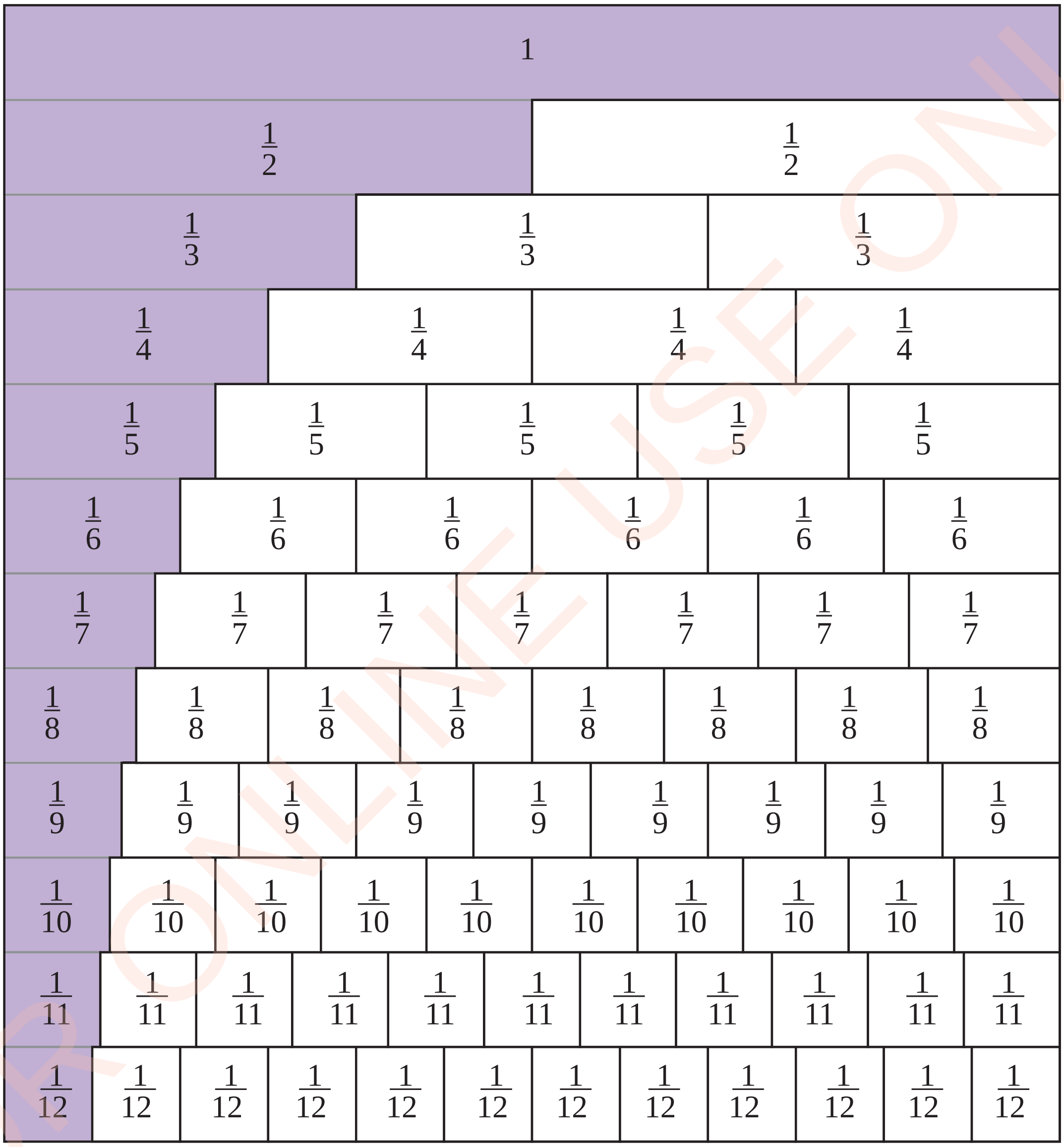
Kulinganisha sehemu

Sehemu zenye thamani tofauti huweza kutambuliwa kwa kutumia mchoro wenye sehemu. Chunguza mchoro ufuatao:



Katika mchoro huu wenye sehemu, urefu wa kivuli huwakilisha ukubwa wa sehemu husika.

Sehemu ipi ni kubwa kati ya $\frac{1}{2}$ na $\frac{1}{4}$?

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Ukichunguza mchoro huu, urefu wa kivuli kinachowakilisha $\frac{1}{2}$ ni mkubwa kuliko urefu wa kivuli kinachowakilisha $\frac{1}{4}$. Kwa hiyo, sehemu kubwa ni $\frac{1}{2}$.

Sehemu ipi ni ndogo zaidi kati ya $\frac{2}{6}$ na $\frac{2}{5}$?

Ukichunguza mchoro, utagundua kuwa urefu wa kivuli kinachowakilisha $\frac{2}{6}$ ni ndogo kuliko urefu wa kivuli kinachowakilisha $\frac{2}{5}$. Hivyo, sehemu ndogo ni $\frac{2}{6}$.

Zoezi la 4

Tumia chati ya mchoro wenye sehemu kujibu maswali yafuatayo:

1. Sehemu ipi ni kubwa kati ya:

(i) $\frac{2}{3}$ na $\frac{5}{6}$ (ii) $\frac{1}{8}$ na $\frac{1}{9}$ (iii) $\frac{4}{5}$ na $\frac{2}{10}$

2. Sehemu ipi ni ndogo kati ya:

(i) $\frac{5}{11}$ na $\frac{2}{3}$ (ii) $\frac{4}{12}$ na $\frac{6}{10}$ (iii) $\frac{6}{7}$ na $\frac{3}{9}$

3. Panga sehemu zifuatazo kwa kila fungu kuanzia ndogo kwenda kubwa:

(i) $\frac{1}{3}, \frac{5}{6}, \frac{1}{2}$ (ii) $\frac{3}{4}, \frac{7}{12}, \frac{2}{3}$ (iii) $\frac{7}{8}, \frac{5}{6}, \frac{3}{4}$

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4. Panga sehemu zifuatazo kwa kila fungu kuanzia kubwa kwenda ndogo:

(i) $\frac{5}{6}, \frac{3}{4}, \frac{2}{3}$ (ii) $\frac{7}{12}, \frac{5}{8}, \frac{3}{7}$ (iii) $\frac{7}{10}, \frac{1}{2}, \frac{3}{5}$

Kujumlisha sehemu zenye asili tofauti

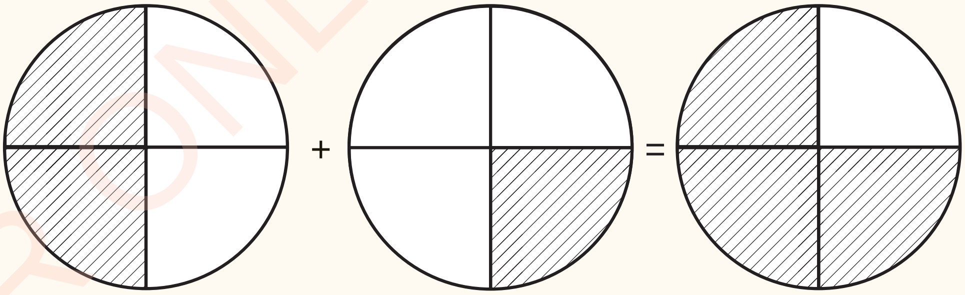
Mfano wa 1

$\frac{1}{2} + \frac{1}{4} =$

Njia

Andika $\frac{1}{2}$ na $\frac{1}{4}$ kwa kutumia sehemu zenye thamani sawa ili kupata asili moja.

$\frac{1}{2} = \frac{2}{4}$



$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$

Hivyo, $\frac{2}{4} + \frac{1}{4} = \frac{2+1}{4} = \frac{3}{4}$.

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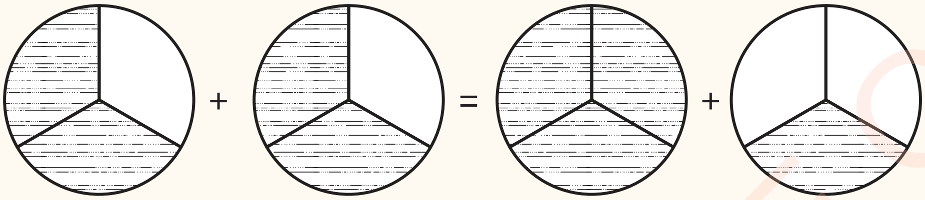
Mfano wa 2

$$\frac{2}{3} + \frac{2}{3} =$$

Njia



$$\frac{2}{3} + \frac{2}{3} = \frac{3}{3} + \frac{1}{3} = \frac{4}{3}$$

Hivyo, $\frac{2}{3} + \frac{2}{3} = \frac{4}{3} = 1\frac{1}{3}$.

Mfano wa 3

$$\frac{2}{5} + \frac{3}{9} =$$

Njia

Sehemu hizi zina asili tofauti. Zibadili ziwe na asili sawa kama ifuatavyo:

$$\frac{2}{5} + \frac{3}{9} = \frac{18 + 15}{45}$$

$$= \frac{33}{45} \text{ au } \frac{11}{15}$$

Hivyo, $\frac{2}{5} + \frac{3}{9} = \frac{33}{45}$ au $\frac{11}{15}$.

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Mfano wa 4

$$\frac{4}{15} + \frac{3}{5} + \frac{1}{30} =$$

Njia

Sehemu hizi zina asili tofauti. Zibadili ziwe na asili sawa kama ifuatavyo:

$$\frac{4}{15} = \frac{8}{30} \text{ na } \frac{3}{5} = \frac{18}{30}.$$

Linganisha sehemu zenye asili moja, kisha jumlisha:

$$\frac{4}{15} + \frac{3}{5} + \frac{1}{30} = \frac{8}{30} + \frac{18}{30} + \frac{1}{30}$$

$$= \frac{8 + 18 + 1}{30} = \frac{27}{30} = \frac{9}{10}$$

Kwa hiyo, $\frac{4}{15} + \frac{3}{5} + \frac{1}{30} = \frac{27}{30}$ au $\frac{9}{10}$.

Zoezi la 5

Jibu maswali yafuatayo:

1. $\frac{3}{5} + \frac{1}{6} =$
2. $\frac{3}{4} + \frac{1}{5} =$
3. $\frac{3}{7} + \frac{4}{21} =$
4. $\frac{30}{36} + \frac{1}{18} =$
5. $\frac{1}{5} + \frac{5}{7} =$
6. $\frac{1}{2} + \frac{1}{4} + \frac{1}{5} =$
7. $\frac{5}{20} + \frac{7}{60} =$
8. $\frac{2}{3} + \frac{5}{9} =$
9. $\frac{1}{7} + \frac{2}{5} =$

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10. $\frac{8}{20} + \frac{24}{40} =$ **11.** $\frac{5}{65} + \frac{1}{13} =$ **12.** $\frac{1}{2} + \frac{1}{3} + \frac{1}{8} =$

13. $\frac{3}{8} + \frac{2}{6} =$ **14.** $\frac{2}{3} + \frac{1}{9} + \frac{1}{18} =$ **15.** $\frac{2}{15} + \frac{9}{10} =$

16. $\frac{20}{50} + \frac{3}{25} =$ **17.** $\frac{3}{4} + \frac{1}{7} + \frac{1}{4} =$ **18.** $\frac{7}{9} + \frac{10}{27} =$

19. $\frac{12}{25} + \frac{13}{100} =$ **20.** $\frac{15}{30} + \frac{45}{90} =$

Kutoa sehemu zenye asili tofauti

Mfano wa 1

$$\frac{3}{4} - \frac{1}{2} =$$

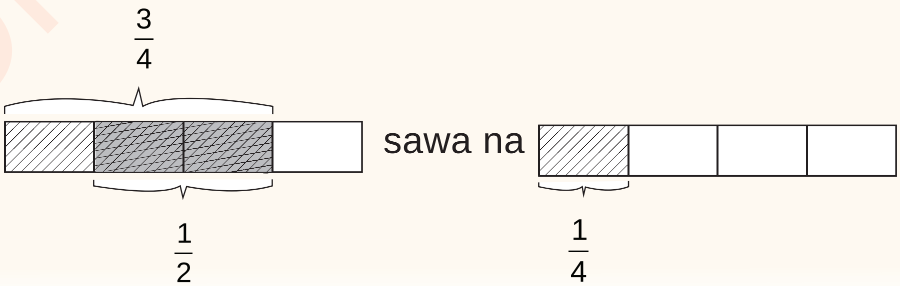
Njia

Sehemu hizi zina asili tofauti. Zibadili ziwe na asili moja kama ifuatavyo:

$$\frac{1}{2} = \frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$$

Hivyo, $\frac{3}{4} - \frac{1}{2} = \frac{3}{4} - \frac{2}{4} = \frac{1}{4}$.

Kwa kutumia mchoro wa mstatili, inakuwa;



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Au

$$\frac{3}{4}-\frac{1}{2}=\frac{3}{4}-\frac{2}{4}$$

$$=\frac{3-2}{4}$$

$$=\frac{1}{4}.$$

Kwa hiyo, $\frac{3}{4}-\frac{1}{2}=\frac{1}{4}$.

Mfano wa 2

$$\frac{3}{5}-\frac{1}{4}=$$

Njia

$$\frac{3}{5}-\frac{1}{4}=\frac{(20\div 5)\times 3-(20\div 4)\times 1}{20}$$

$$=\frac{(4\times 3)-(5\times 1)}{20}$$

$$=\frac{12-5}{20}$$

$$=\frac{7}{20}.$$

Kwa hiyo, $\frac{3}{5}-\frac{1}{4}=\frac{7}{20}$.

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Mfano wa 3

$$\frac{5}{6} - \frac{4}{7} =$$

Njia

$$\frac{5}{6} - \frac{4}{7} = \frac{(42 \div 6) \times 5 - (42 \div 7) \times 4}{42}$$

$$= \frac{(7 \times 5) - (6 \times 4)}{42}$$

$$= \frac{35 - 24}{42}$$

$$= \frac{11}{42}.$$

Kwa hiyo, $\frac{5}{6} - \frac{4}{7} = \frac{11}{42}$.

Zoezi la 6

Jibu maswali yafuatayo:

1. $\frac{8}{9} - \frac{2}{6} =$
2. $\frac{4}{8} - \frac{2}{10} =$
3. $\frac{1}{2} - \frac{1}{3} =$
4. $\frac{15}{20} - \frac{14}{40} =$
5. $\frac{25}{30} - \frac{13}{90} =$
6. $\frac{3}{7} - \frac{2}{14} =$
7. $\frac{3}{4} - \frac{4}{9} =$
8. $\frac{6}{8} - \frac{2}{5} =$
9. $\frac{54}{60} - \frac{9}{20} =$
10. $\frac{5}{9} - \frac{2}{4} =$
11. $\frac{8}{15} - \frac{10}{30} =$
12. $\frac{6}{7} - \frac{4}{14} =$

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13. $\frac{9}{20} - \frac{3}{10} =$ **14.** $\frac{8}{12} - \frac{1}{5} =$ **15.** $\frac{3}{5} - \frac{3}{8} =$

16. $\frac{20}{22} - \frac{8}{11} =$ **17.** $\frac{24}{28} - \frac{19}{56} =$ **18.** $\frac{10}{13} - \frac{5}{39} =$

19. $\frac{46}{50} - \frac{40}{100} =$ **20.** $\frac{18}{30} - \frac{7}{60} =$

Kuzidisha sehemu zenye asili tofauti

Mfano wa 1

(a) $\frac{1}{3} \times \frac{1}{4} =$

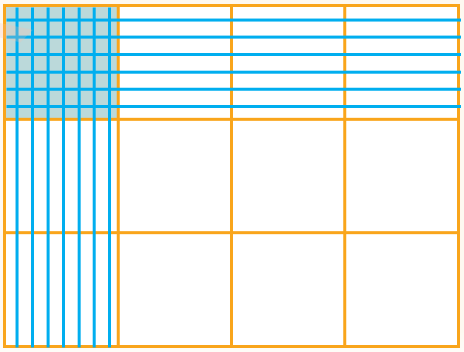
Njia

Zidisha kiasi kwa kiasi na asili kwa asili:

$$\frac{1}{3} \times \frac{1}{4} = \frac{1 \times 1}{3 \times 4} = \frac{1}{12}$$

Au kwa kutumia michoro ya mistatili:

$$\frac{1}{3} \times \frac{1}{4} =$$



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Hatua:

1. Chora mistatili mitatu ya ulalo na mistatili minne ya wima katika mstatili mmoja.

2. Weka kivuli $\frac{1}{4}$ kwa wima na $\frac{1}{3}$ kwa ulalo.

3. Hesabu idadi ya miraba iliyotiwa kivuli mara mbili: unapata mraba **mmoja** ambao ni **kiasi**.

4. Idadi ya miraba yote iliyo na kivuli na isiyo na kivuli ni 12 ambayo ni **asili**.

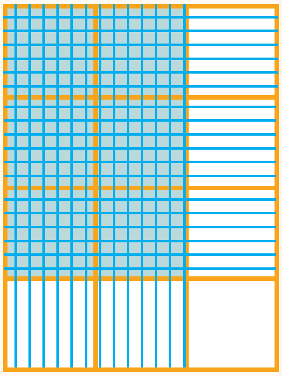
   Hivyo, $\frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$.

(b) $\frac{3}{4} \times \frac{2}{3} =$

Hatua:

1. Chora mistatili minne ya ulalo na mitatu ya wima katika mstatili mmoja.

2. Weka kivuli $\frac{3}{4}$ kwa ulalo na $\frac{2}{3}$ kwa wima.



3. Hesabu idadi ya miraba iliyotiwa kivuli mara mbili: unapata miraba **sita** ambayo ni **kiasi**.

4. Idadi ya miraba yote ni 12 ambayo ni **asili**.

   Hivyo, $\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$.

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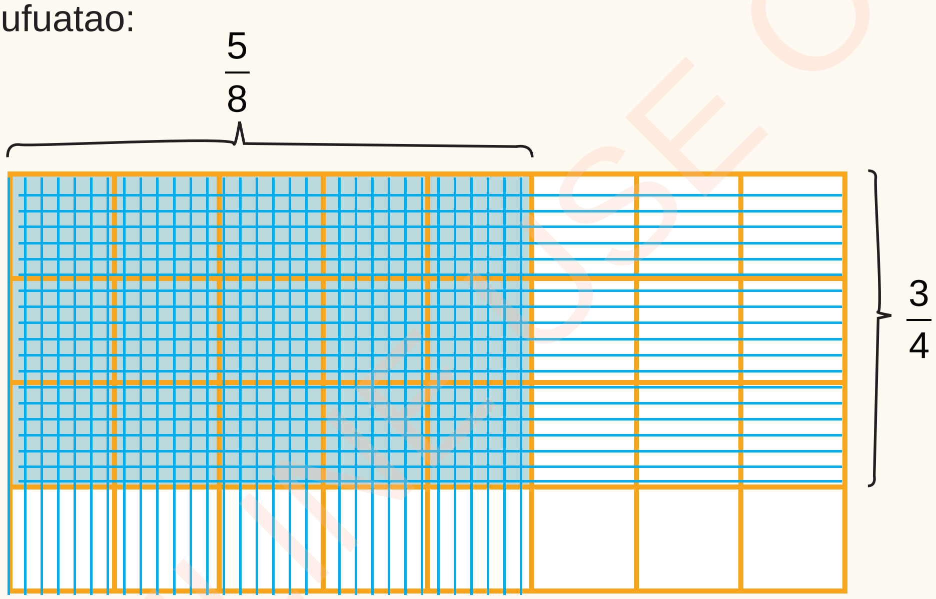
Mfano wa 2

$\frac{5}{8} \times \frac{3}{4} =$

Hatua:

1. Chora mstatili na ugawe sehemu zilizosawa 4 katika ulalo na 8 katika wima kama inavyoonekana katika mchoro ufuatao:



2. Weka kivuli $\frac{3}{4}$.
3. Weka kivuli tena sehemu $\frac{5}{8}$.
4. Miraba iliyowekwa kivuli mara mbili ndio zao la $\frac{5}{8} \times \frac{3}{4}$.
5. Hesabu miraba iliyopitiwa na kivuli kwa mara ya kwanza na mara ya pili, utapata miraba 15.
6. Idadi ya miraba yote iliyo na kivuli na isiyo na kivuli ni 32.

Kwa hiyo, $\frac{5}{8} \times \frac{3}{4} = \frac{15}{32}$.

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Zoezi la 7

Jibu maswali yafuatayo:

1. $\frac{2}{5} \times \frac{3}{7} =$
2. $\frac{6}{9} \times \frac{1}{7} =$
3. $\frac{2}{4} \times \frac{3}{5} =$
4. $\frac{3}{8} \times \frac{5}{10} =$
5. $\frac{13}{15} \times \frac{2}{4} =$
6. $\frac{7}{12} \times \frac{1}{6} =$
7. $\frac{4}{5} \times \frac{6}{11} =$
8. $\frac{1}{4} \times \frac{2}{7} =$
9. $\frac{2}{3} \times \frac{7}{10} =$
10. $\frac{8}{9} \times \frac{1}{3} =$
11. $\frac{2}{4} \times \frac{3}{4} =$
12. $\frac{11}{13} \times \frac{1}{5} =$
13. $\frac{3}{14} \times \frac{1}{2} =$
14. $\frac{5}{9} \times \frac{4}{6} =$
15. $\frac{7}{8} \times \frac{1}{5} =$
16. $\frac{2}{7} \times \frac{5}{7} =$
17. $\frac{3}{5} \times \frac{5}{9} =$
18. $\frac{3}{4} \times \frac{6}{10} =$
19. $\frac{1}{4} \times \frac{4}{5} =$
20. $\frac{17}{19} \times \frac{1}{2} =$

Kuzidisha sehemu kwa namba nzima

Mfano wa 1

$$4 \times \frac{1}{5} =$$

Njia

Unapozidisha namba nzima kwa sehemu, kwanza andika namba nzima kama sehemu:

$$4 = \frac{4}{1}$$

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Kisha zidisha kiasi kwa kiasi na asili kwa asili:

$$4 \times \frac{1}{5} = \frac{4}{1} \times \frac{1}{5}$$

$$= \frac{4}{5}.$$

Hivyo, $4 \times \frac{1}{5} = \frac{4}{5}$.

Mfano wa 2

$$\frac{2}{3} \times 12 =$$

Njia

$$\frac{2}{3} \times 12 = \frac{2}{3} \times \frac{12}{1} =$$

$$= \frac{24}{3}$$

$$= 8$$

Kwa hiyo, $\frac{2}{3} \times 12 = 8$.

Zoezi la 8

Jibu maswali yafuatayo:

1. $6 \times \frac{3}{4} =$
2. $\frac{2}{3} \times 9 =$
3. $\frac{5}{6} \times 30 =$
4. $\frac{1}{2} \times 24 =$
5. $27 \times \frac{1}{9} =$
6. $15 \times \frac{2}{5} =$

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7. $12 \times \frac{1}{6} =$

8. $\frac{2}{10} \times 4 =$

9. $\frac{5}{9} \times 18 =$

10. $21 \times \frac{1}{7} =$

11. $\frac{1}{3} \times 36 =$

12. $\frac{1}{8} \times 32 =$

13. $5 \times \frac{1}{6} =$

14. $20 \times \frac{1}{4} =$

15. $\frac{1}{10} \times 50 =$

16. $3 \times \frac{3}{11} =$

17. $13 \times \frac{1}{13} =$

18. $40 \times \frac{1}{20} =$

19. $\frac{7}{10} \times 10 =$

20. $\frac{2}{5} \times 25 =$

Mafumbo ya sehemu

Mfano wa 1

Nyumbani kulikuwa na mfuko mmoja wa sukari. Anna alitumia $\frac{5}{6}$ ya sukari katika mfuko huo na Magoma alitumia $\frac{1}{8}$ ya sukari katika mfuko huo. Jumla walitumia sehemu gani ya sukari?

Njia

Anna alitumia $\frac{5}{6}$ ya sukari

Magoma alitumia $\frac{1}{8}$ ya sukari

Jumlisha hizo sehemu: $\frac{5}{6} + \frac{1}{8} = \frac{20 + 3}{24}$

$$= \frac{23}{24}.$$

Kwa hiyo, walitumia $\frac{23}{24}$ ya sukari katika mfuko.

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Mfano wa 2

Ali alivuna $\frac{6}{7}$ ya vitunguu katika shamba na Zaituni alivuna $\frac{1}{9}$ ya vitunguu katika shamba hilo hilo. Nini tofauti ya sehemu ya vitunguu walivyovuna?

Njia

Ali alivuna $\frac{6}{7}$

Zaituni alivuna $\frac{1}{9}$

Toa hizo sehemu, $\frac{6}{7} - \frac{1}{9} = \frac{54 - 7}{63} = \frac{47}{63}$.

Kwa hiyo, tofauti ni $\frac{47}{63}$.

Mfano wa 3

Bibi hunywa $\frac{3}{4}$ ya lita 1 ya maziwa kwa siku moja, atakunywa lita ngapi kwa siku 6?

Njia

$$\frac{3}{4} \times 6 = \frac{3}{4} \times \frac{6}{1}$$

$$= \frac{3 \times 6}{4 \times 1} = \frac{18}{4}$$

$$= \frac{9}{2}$$

$$= 4\frac{1}{2}.$$

Kwa hiyo, bibi atakunywa lita $4\frac{1}{2}$.

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Zoezi la 9

Jibu maswali yafuatayo:

1. Mwalimu alitumia $\frac{1}{3}$ ya mshahara wake kulipa ada ya mtoto wake na $\frac{2}{5}$ kwa matumizi ya chakula. Je, mwalimu alitumia sehemu gani ya mshahara wake?
2. Nusu ya bustani ilipandwa bamia na $\frac{3}{8}$ ya bustani hiyo ilipandwa mchicha. Sehemu gani ya bustani ilipandwa mchicha na bamia?
3. John ana uwezo wa kula $\frac{3}{5}$ ya mkate na Elizabeti ana uwezo wa kula $\frac{2}{7}$ ya mkate huo. Sehemu gani ya mkate watakayokula wote wawili?
4. Mama alipika $\frac{1}{2}$ ya kilogramu ya mchele siku ya kwanza. Siku ya pili alipika $\frac{1}{3}$ ya kilogramu ya mchele. Je, mama alipika sehemu gani ya kilogramu ya mchele kwa siku zote mbili?
5. Wakati wa likizo, $\frac{1}{4}$ ya wanafunzi walisafiri kwa basi na $\frac{1}{3}$ ya wanafunzi walisafiri kwa treni. Sehemu gani ya wanafunzi walisafiri kwa basi na treni kwa pamoja?
6. Baraka alichukua $\frac{3}{5}$ ya magunia ya maharage. Asha alichukua $\frac{1}{10}$ ya magunia ya maharage. Je, ni sehemu gani ya magunia ya maharage haikuchukuliwa?
7. Shule ya Msingi Muungano ina ng'ombe 80. Shule iliamua kuuza $\frac{2}{5}$ ya ng'ombe hao. Je, shule ilibakiwa na ng'ombe wangapi?

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8. Amina alichukua $\frac{2}{5}$ ya kitambaa cha gauni. Anna alichukua $\frac{1}{10}$ ya kitambaa hichohicho. Wote wawili walichukua sehemu gani ya kitambaa hicho?

9. Juma alichora kipande cha mstari chenye urefu wa sentimeta 9. Baadaye alichora kipande kingine ambacho ni $\frac{1}{3}$ ya kipande cha kwanza. Nini urefu wa kipande cha pili cha mstari?

10. Siku moja kaka, dada na mjomba walimsaidia mama kulima bustani yake. Kaka alilima $\frac{1}{5}$ ya bustani, dada alilima $\frac{3}{10}$ ya bustani hiyo na mjomba alilima $\frac{2}{5}$. Jumla walilima sehemu gani ya bustani?

11. Eliudi alikuwa na magunia 20 ya ulezi. $\frac{1}{2}$ ya magunia hayo alimpa kaka yake. Je, kaka alipata magunia mangapi ya ulezi?

12. Nyumba ya kulala wageni ina vitanda 48. Iwapo $\frac{1}{12}$ ya vitanda hivyo ni vya chuma, je, vitanda vingapi ni vya chuma?

13. Kangaroo alikimbia $\frac{1}{3}$ ya umbali wa kilometa 15. Je, Kangaroo alikimbia umbali gani?

14. Shule ya msingi Mwembechai iliandikisha wanafunzi 30 wa darasa la awali. Iwapo $\frac{1}{6}$ ya wanafunzi hao hawakuhudhuria masomo, je, wanafunzi wangapi hawakuhudhuria masomo?

15. Chuo cha ufundi kina walimu 80. Iwapo $\frac{3}{4}$ ya walimu hao ni wa kike, je, walimu wa kiume ni wangapi?

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Zoezi la 10

Jibu maswali yafuatayo:

1. Sehemu ipi ni kubwa kati ya $\frac{7}{8}$ na $\frac{8}{9}$?

2. Nini tofauti kati ya $\frac{3}{5}$ na $\frac{1}{6}$?

3. $\frac{6}{10} + \frac{7}{9} =$

4. $10 \times \frac{3}{4} =$

5. $\frac{54}{60} \times \frac{3}{4} =$

6. Toa $\frac{3}{7}$ kutoka $\frac{11}{12}$

7. $\frac{13}{15} \times \frac{9}{10} =$

8. $\frac{5}{7} \times 28 =$

9. Tafuta $\frac{2}{5}$ ya watu 200.

10. Zidisha $\frac{1}{8}$ kwa 8

11. Zidisha 24 kwa $\frac{3}{12}$

12. $\frac{17}{34} - \frac{19}{68} =$

13. $\frac{1}{10} + \frac{2}{20} + \frac{15}{40} =$

14. $\frac{38}{40} - \frac{52}{80} =$

15. $\frac{2}{4} + \frac{2}{3} + \frac{2}{6} =$

16. $\frac{2}{5} + \frac{1}{3} + \frac{1}{5} =$

17. $\frac{4}{6} - \frac{5}{9} =$

18. Tafuta tofauti kati ya $\frac{8}{9}$ na $\frac{9}{27}$.

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19. Masalu alikuwa na maembe 88. Aliuza $\frac{1}{8}$ ya maembe hayo. Maembe mangapi yaliuzwa?

20. Furaha amelima $\frac{5}{7}$ ya shamba lake na amempa rafiki yake $\frac{1}{8}$ ya shamba hilo alime. Je, Furaha amelima sehemu gani ya shamba zaidi ya rafiki yake?

Jikumbushe

1. Katika kuzidisha sehemu kwa sehemu, zidisha kiasi kwa kiasi na asili kwa asili.
2. Unapozidisha namba nzima na sehemu, namba nzima huandikwa katika sehemu.
3. Sehemu guni ikirahisishwa tunapata namba mchanganyiko.

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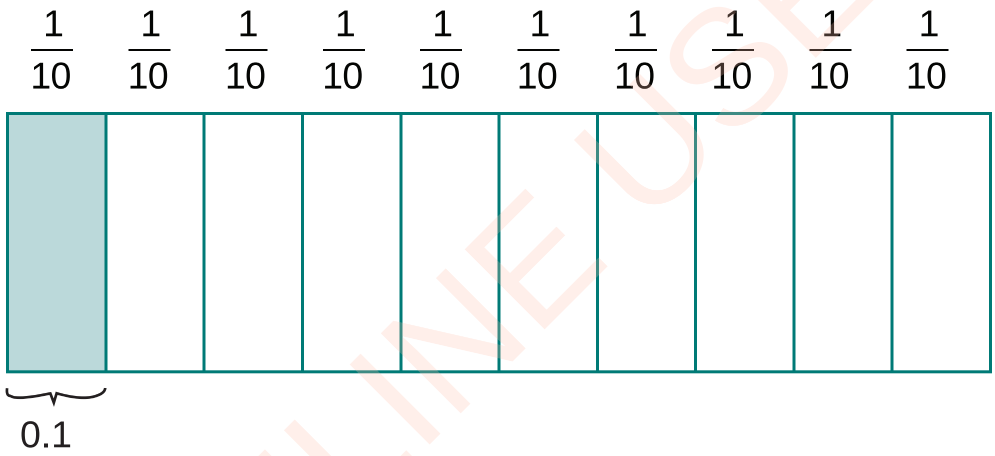
Sura ya Tisa

Desimali

Dhana ya desimali inahusiana na sehemu. Katika sura hii, utajifunza kusoma, kuandika, kujumlisha, kutoa na kuzidisha desimali.

Maana ya desimali

Tazama umbo lifuatalo:



Umbo hili limegawanywa katika sehemu kumi zilizosawa. Sehemu iliyotiwa kivuli ni $\frac{1}{10}$ ya umbo zima na huandikwa 0.1 katika desimali. Namba 0.1 hupatikana baada ya kugawanya 1 kwa 10.

Kuna desimali za aina nyingi. Desimali zenye asili ya kumi ni kama zifuatazo:

(a) $\frac{2}{10} = 0.2$ (b) $\frac{4}{10} = 0.4$ (c) $\frac{9}{10} = 0.9$

Katika desimali 0.2, 0.4 na 0.9; nukta inatenganisha namba nzima na namba ambayo ni sehemu ya kumi.

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Kusoma desimali

Kusoma desimali zenye nafasi moja

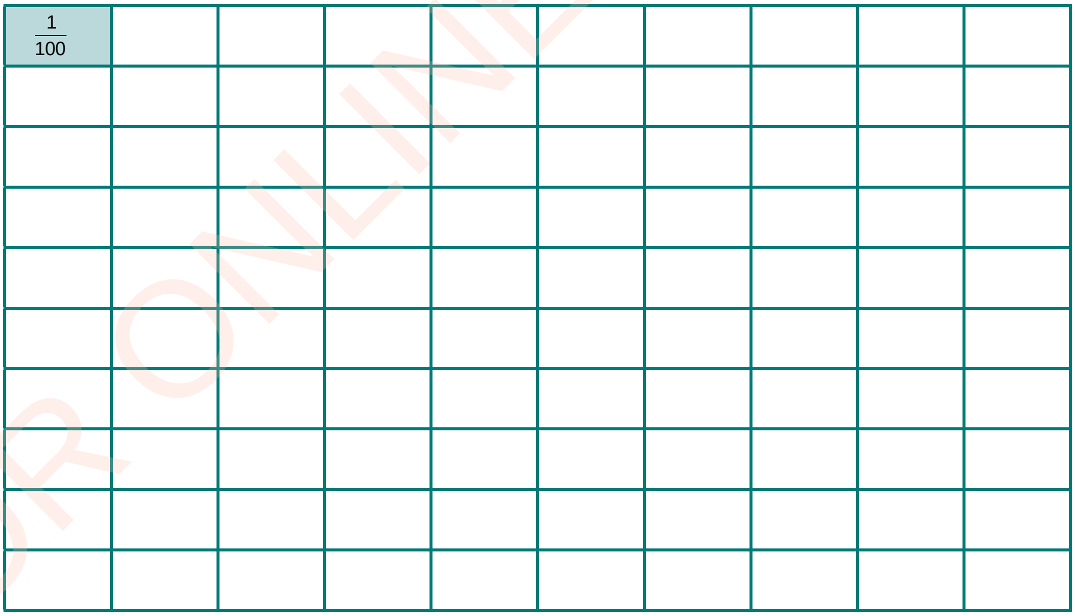
Desimali husomwa kutoka kushoto kuelekea kulia.

Mfano

Desimali	Namba inavyosomeka
0.7	Sifuri nukta saba
1.8	Moja nukta nane
25.6	Ishirini na tano nukta sita
250.1	Mia mbili hamsini nukta moja

Kusoma desimali zenye nafasi mbili

Tumia mchoro ufuatao kubaini desimali.



Sehemu iliyotiwa kivuli ni $\frac{1}{100}$ ya umbo zima na huandikwa 0.01.

Namba 0.01 inapatikana kwa kugawanya 1 kwa 100.

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Kwa kutumia mchoro huo unaweza kupata desimali mbalimbali, kwa mfano:

(a) $\frac{3}{100} = 0.03$ (b) $\frac{12}{100} = 0.12$ (c) $\frac{94}{100} = 0.94$

Namba zenye desimali mbili husomwa kuanzia kushoto kuelekea kulia. Tarakimu zilizopo kushoto mwa nukta ya desimali husomwa kama namba za kawaida. Tarakimu za kulia mwa nukta (desimali) husomwa mojamoja. Kwa mfano:

Desimali	**Namba inavyosomeka**
0.05	Sifuri nukta sifuri tano
0.13	Sifuri nukta moja tatu
15.34	Kumi na tano nukta tatu nne
525.25	Mia tano ishirini na tano nukta mbili tano

Zoezi la 1

Andika namba zifuatazo kwa maneno.

1.	(a)	0.4	(b)	1.7	(c)	18.9	(d)	28.2
2.	(a)	43.5	(b)	132.5	(c)	631.8	(d)	0.1
3.	(a)	0.01	(b)	1.23	(c)	2.07	(d)	0.25
4.	(a	18.15	(b)	84.72	(c)	24.99	(d)	72.75
5.	(a)	113.04	(b)	583.94	(c)	716.88	(d)	2.04

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Kuandika desimali kwa maneno na kwa tarakimu

Mfano wa 1

Andika namba za desimali zifuatazo kwa maneno.

	Namba za desimali kwa tarakimu	**Namba za desimali kwa maneno**
(a)	0.4	Sifuri nukta nne
(b)	2.1	Mbili nukta moja
(c)	0.08	Sifuri nukta sifuri nane
(d)	13.26	Kumi na tatu nukta mbili sita

Mfano wa 2

Andika namba za desimali zifuatazo kwa tarakimu.

	Namba za desimali kwa maneno	**Namba za desimali kwa tarakimu**
(a)	Sifuri nukta tano	0.5
(b)	Kumi na moja nukta sita	11.6
(c)	Sifuri nukta sifuri tisa	0.09
(d)	Ishirini na tatu nukta tatu saba	23.37

Zoezi la 2

Jibu maswali yafuatayo:

1. Andika namba za desimali zifuatazo kwa maneno.

(a) 0.6 (b) 0.1 (c) 0.3 (d) 2.4

(e) 6.7 (f) 12.8 (g) 0.02 (h) 0.29

(i) 48.65 (j) 93.07 (k) 68.31

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2. Andika namba za desimali zifuatazo kwa tarakimu.

(a) Sifuri nukta tano tatu.
(b) Nane nukta saba tano.
(c) Kumi nukta tisa.
(d) Sifuri nukta sifuri mbili.
(e) Kumi na moja nukta nane mbili.
(f) Kumi na tatu nukta sifuri moja.
(g) Hamsini na sita nukta mbili tano.
(h) Ishirini na nne nukta moja nane.

Kubadili sehemu kuwa desimali

Namba za desimali hupatikana kwa kugawanya kiasi kwa asili.

Mfano wa 1

Badili $\frac{6}{10}$ kuwa namba za desimali.

Hatua:

1. Gawanya kiasi kwa asili, 6 ÷ 10 haiwezekani. Weka 0 juu ya 6, katika nafasi ya jibu kisha weka nukta kama ilivyooneshwa katika hatua ya 2.

2. Ongeza sifuri mbele ya 6 katika kigawanye na kuwa 60, kisha gawanya kwa 10, unapata 6. Andika 6 baada ya nukta.

$$\begin{array}{r} 0.6 \\ 10\overline{)\;60} \\ -60 \\ \hline 0 \\ \hline \end{array}$$

Kwa hiyo, $\frac{6}{10} = 0.6$.

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Mfano wa 2

Badili $\frac{1}{2}$ kuwa namba ya desimali.

Hatua:

1. Gawanya 1 kwa 2 haiwezekani. Andika 0 juu ya 1 katika nafasi ya jibu kisha weka nukta.

$$2\overset{0.}{\overline{)1}}$$

2. Weka 0 mbele ya 1, kisha gawanya 10 kwa 2, unapata 5. Andika 5 mbele ya nukta, kisha zidisha 5 na 2, unapata 10. Toa, 10 – 10 = 0.

$$\begin{array}{r} 0.5 \\ 2\overline{)10} \\ -\ 10 \\ \hline 0 \\ \hline \end{array}$$

Hivyo, $\frac{1}{2} = 0.5$.

Mfano wa 3

Badili $\frac{1}{100}$ kuwa namba ya desimali.

Hatua:

1. Gawanya kiasi kwa asili kama ilivyooneshwa. $100\overline{)1}$

2. Gawanya 1 kwa 100 haiwezekani. Andika 0 na weka nukta juu ya 1, kisha ongeza 0 mbele ya 1 kuwa 10.

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3. Gawanya 10 kwa 100 haiwezekani. Andika 0 kulia kwa nukta, kisha weka 0 mbele ya 10 kuwa 100.

4. Gawanya 100 kwa 100 kupata 1. Andika 1 kulia kwa 0.0 katika nafasi ya hisa.

$$\begin{array}{r} 0.01 \\ 100\overline{)100} \\ -100 \\ \hline 0 \\ \hline \end{array}$$

Hivyo, $\frac{1}{100} = 0.01$, husomwa sifuri nukta sifuri moja.

Mfano wa 4

Badili $\frac{5}{2}$ kuwa namba ya desimali.

Njia

$$\begin{array}{r} 2.5 \\ 2\overline{)5} \\ -4 \\ \hline 10 \\ -10 \\ \hline 0 \\ \hline \end{array}$$

Zoezi la 3

Badili sehemu zifuatazo kuwa namba ya desimali:

1. (a) $\frac{3}{10}$ (b) $\frac{8}{10}$ (c) $\frac{7}{10}$ (d) $\frac{12}{10}$

2. (a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{3}{2}$ (d) $\frac{7}{5}$

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3. (a) $\frac{3}{100}$ (b) $\frac{15}{100}$ (c) $\frac{76}{100}$ (d) $\frac{83}{100}$

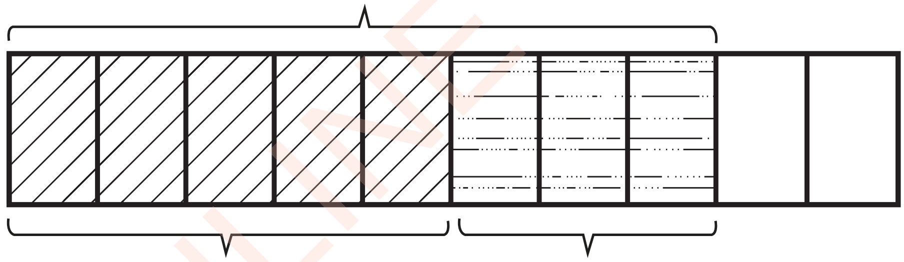
4. (a) $\frac{1}{25}$ (b) $\frac{1}{4}$ (c) $\frac{3}{4}$ (d) $\frac{5}{4}$

5. (a) $\frac{6}{100}$ (b) $\frac{108}{100}$ (c) $\frac{176}{100}$ (d) $\frac{27}{100}$

Kujumlisha desimali

Kujumlisha desimali zenye nafasi moja

Tumia mchoro ufuatao kujumlisha desimali.



Kwa kutumia mchoro huo; 0.5 + 0.3 = 0.8.

Mfano wa 1

0.5 + 0.2 =

Hatua:

1. Panga na kujumlisha kwanza namba zilizopo kulia kwa nukta yaani, 5 + 2 = 7. Andika 7 katika nafasi ya desimali.

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2. Jumlisha upande wa mamoja;
0 + 0 = 0. Andika 0 katika nafasi ya mamoja.

$$\begin{array}{r} 0.5 \\ +\ 0.2 \\ \hline 0.7 \\ \hline \end{array}$$

Kwa hiyo, 0.5 + 0.2 = 0.7.

Mfano wa 2

$$\begin{array}{r} 1.7 \\ +\ 2.6 \\ \hline \\ \hline \end{array}$$

Hatua:

1. Jumlisha namba zilizopo kulia kwa nukta: 7 + 6 = 13. Andika 3 katika nafasi ya desimali na jumlisha 1 katika mamoja.

2. Jumlisha mamoja 1 + 1 + 2 = 4. Andika 4 katika nafasi ya mamoja.

3. Kwa kujumlisha upande wa desimali na namba unapata 4.3.

$$\begin{array}{r} 1.7 \\ +\ 2.6 \\ \hline 4.3 \\ \hline \end{array}$$

Kwa hiyo, 1.7 + 2.6 = 4.3.

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Mfano wa 3

22.5 + 30.2 =

Kupata jibu panga namba kama ifuatavyo;

$$\begin{array}{r} 22.5 \\ +\ 30.2 \\ \hline 52.7 \\ \hline \end{array}$$

Kwa hiyo, 22.5 + 30.2 = 52.7.

Zoezi la 4

Jibu maswali yafuatayo:

1. 0.4 + 0.7 =

2. 0.6 + 0.3 =

3. 126.7 + 2.1=

4. 6.4 + 7.9 =

5. 23.4 + 5.2 =

6. 36.7 + 5.4 =

7. 34.9 + 98.5 =

8. 86.5 + 12.2 =

9. 137.1 + 28.7 =

10. 250.8 + 22.4 =

11. 325.4 + 86.8 =

12. 58 + 2.6 =

13. 224.2 + 4.5 =

14. 79.3 + 46.1 =

15. 188.3 + 15.9 =

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Kujumlisha desimali zenye nafasi mbili

Mfano wa 1

2.45 + 0.31 =

Hatua:

1. Panga mamoja kwa mamoja na desimali kwa desimali.

$$\begin{array}{r} 2.45 \\ +\ 0.31 \\ \hline \\ \hline \end{array}$$

2. Anza kujumlisha upande wa desimali: 45 + 31 = 76. Andika 76 chini ya desimali.

3. Jumlisha mamoja: 2 + 0 = 2. Andika 2 chini ya mamoja.

4. Kwa kujumlisha upande wa desimali na namba unapata 2.76.

$$\begin{array}{r} 2.45 \\ +\ 0.31 \\ \hline 2.76 \\ \hline \end{array}$$

Kwa hiyo, 2.45 + 0.31 = 2.76.

Mfano wa 2

2.98 + 2.65 =

Hatua:

1. Panga kwa wima mamoja kwa mamoja na desimali kwa desimali.

$$\begin{array}{r} 2.98 \\ +\ 2.65 \\ \hline \\ \hline \end{array}$$

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2. Anza kujumlisha upande wa desimali: 98 + 65 = 163. Andika 63 upande wa desimali, kisha hamisha 1 katika mamoja.

3. Jumlisha mamoja: 1+ 2 + 2 = 5. Andika 5 chini ya mamoja.

4. Kwa kujumlisha upande wa desimali na namba unapata 5.63.

$$\begin{array}{r} 2.98 \\ +\ 2.65 \\ \hline 5.63 \\ \hline \end{array}$$

Kwa hiyo, 2.98 + 2.65 = 5.63.

Mfano wa 3

32.25 + 14.27 =

Njia

$$\begin{array}{r} 32.25 \\ +\ 14.27 \\ \hline 46.52 \\ \hline \end{array}$$

Zoezi la 5

Jibu maswali yafuatayo

1. 0.35 + 0.24 =

2. 1.56 + 0.33 =

3. 2.36 + 1.22 =

4. 21.57 + 9.24 =

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5. 38.64 + 6.27 =	**6.** 26.72 + 3.18 =
7. 37.26 + 2.83 =	**8.** 4.85 + 43.37 =
9. 3.68 + 72.44 =	**10.** 95.25 + 6.76 =
11. 33.75 + 12.26 =	**12.** 94.18 + 24.32 =
13. 84.34 + 13.88 =	**14.** 76.09 + 21.05 =
15. 86.45 + 3.79 =	

Kutoa desimali

Kutoa desimali zenye nafasi moja

Kutoa desimali hufanyika kama kutoa namba za kawaida:

Mfano wa 1

5.3 – 3.2 =

Hatua:

1. Anza kutoa upande wa desimali kama namba za kawaida 3 – 2 = 1. Andika katika safu ya desimali. Andika nukta kushoto kwa 1.
2. Toa mamoja kwa mamoja: 5 – 3 = 2. Andika 2 kushoto kwa nukta.

Kwa hiyo, 5.3 – 3.2 = 2.1.

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Mfano wa 2

13.6 – 4.9 =

Hatua:

1. Anza kutoa desimali 6 – 9, haiwezekani. Chukua 1 kutoka kwenye mamoja, ambayo ni sawa na 10 ongeza 6 kupata 16. Toa 16 – 9 = 7. Andika 7 upande wa desimali.
2. Andika nukta kushoto kwa 7.
3. Toa namba nzima , 12 – 4 = 8. Andika 8 kushoto kwa nukta.
   Kwa hiyo, 13.6 – 4.9 = 8.7.

Mfano wa 3

26.5 – 18.6 =

Njia

$$\begin{array}{r} 26.5 \\ -\,18.6 \\ \hline 7.9 \\ \hline \end{array}$$

Zoezi la 6

Jibu maswali yafuatayo:

1. 0.8 – 0.2 =

2. 0.9 – 0.7 =

3. 2.4 – 0.8 =

4. 3.6 – 2.8 =

5. 4.7 – 0.9 =

6. 22.7 – 4 =

7. 35.6 – 24.2 =

8. 64.5 – 34.8 =

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9. 125.2 – 0.7=	**10.** 226.4 – 22.5 =
11. 27.4 – 13.3 =	**12.** 12.6 – 1.4 =
13. 17.8 – 9.7 =	**14.** 45.1 – 22.8 =
15. 125.2 – 94.8 =	**16.** 0.6 – 0.3 =
17. 30.8 – 15.3 =	**18.** 120.2 – 98.7 =
19. 55.1 – 54.9 =	**20.** 235.9 – 0.7 =

Kutoa desimali zenye nafasi mbili

Kutoa desimali zenye nafasi mbili, toa kama namba za kawaida na tenga nafasi mbili kwenye jibu kuanzia kulia.

Mfano wa 1

0.84 – 0.21 =

Hatua:

1. Panga namba kama ifuatavyo;

$$\begin{array}{r} 0.84 \\ -\,0.21 \\ \hline \\ \hline \end{array}$$

2. Anza kutoa upande wa desimali 84 – 21 = 63. Andika 63 katika nafasi za desimali.

3. Toa upande wa mamoja 0 – 0 = 0. Andika 0 katika nafasi ya mamoja.

$$\begin{array}{r} 0.84 \\ -\,0.21 \\ \hline 0.63 \\ \hline \end{array}$$

Kwa hiyo, 0.84 – 0.21 = 0.63.

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Mfano wa 2

2.45 – 1.64 =

Hatua:

1. Panga namba kwa wima.

$$\begin{array}{r} 2.45 \\ -\ 1.64 \\ \hline \\ \hline \end{array}$$

2. Anza kutoa upande wa desimali, 5 – 4 = 1. Andika 1 upande wa desimali. Fuatisha 4 – 6 haiwezekani. Chukua 1 kutoka katika mamoja ambayo ni sawa na 10 kisha jumlisha na 4 kupata 14. Hivyo, 14 – 6 = 8. Andika 8 katika nafasi ya desimali kushoto mwa 1 kupata 81.

3. Toa mamoja 1 – 1 = 0. Andika 0 katika nafasi ya mamoja.

$$\begin{array}{r} 2.45 \\ -\ 1.64 \\ \hline 0.81 \\ \hline \end{array}$$

Kwa hiyo, 2.45 – 1.64 = 0.81.

Mfano wa 3

12.46 – 8.64 =

Njia

Zipange namba hizo kwa wima kama ifuatavyo;

$$\begin{array}{r} 12.46 \\ -\ \ 8.64 \\ \hline 3.82 \\ \hline \end{array}$$

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Zoezi la 7

Jibu maswali yafuatayo

1.	0.62 – 0.21 =	**2.**	0.25 – 0.12 =
3.	0.86 – 0.34 =	**4.**	0.82 – 0.36 =
5.	0.67 – 0.48 =	**6.**	0.33 – 0.29 =
7.	2.45 – 0.26 =	**8.**	3.68 – 1.23 =
9.	5.27 – 4.25 =	**10.**	12.54 – 6.71 =
11.	47.76 – 34.25 =	**12.**	42.26 – 13.47 =
13.	126.57 – 52.36 =	**14.**	364.20 – 72.66 =
15.	96.31 – 28.29 =	**16.**	422.04 – 260.06 =
17.	10.14 – 3.05 =	**18.**	0.05 – 0.03 =
19.	3.05 – 2.45 =	**20.**	530.05 – 490.75 =

Kuzidisha desimali

Kuzidisha desimali zenye nafasi moja kwa namba nzima

Kuzidisha desimali zenye nafasi moja kwa namba nzima, zidisha kama namba za kawaida kisha tenga nafasi moja ya desimali katika jibu kutoka kulia.

Mfano wa 1

$$\begin{array}{r} 4.1 \\ \times \quad 2 \\ \hline \\ \hline \end{array}$$

Hatua:

1. Zidisha 41 × 2 = 82
2. Tenga nafasi moja ya desimali unapata 8.2. Kwa hiyo, 4.1 × 2 = 8.2.

Mfano wa 2

8.3 × 12 =

Njia

8.3 × 12 = 99.6

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Mfano wa 3

$$\begin{array}{r} 219.8 \\ \times \quad 23 \\ \hline \\ \hline \end{array}$$

Njia

$$\begin{array}{r} 219.8 \\ \times \quad 23 \\ \hline 6594 \\ +\ 4396 \\ \hline 5055.4 \\ \hline \end{array}$$

Zoezi la 8

Jibu maswali yafuatayo:

1. 0.6 × 4 =
2. 2.3 × 3 =
3. 3.1 × 4 =

4. $\begin{array}{r} 1.2 \\ \times \quad 6 \\ \hline \\ \hline \end{array}$
5. $\begin{array}{r} 6.8 \\ \times \quad 5 \\ \hline \\ \hline \end{array}$
6. $\begin{array}{r} 21.4 \\ \times \quad 8 \\ \hline \\ \hline \end{array}$

7. 4.7 × 21 =
8. 18.9 × 34 =
9. 112.6 × 11 =

10. $\begin{array}{r} 699.7 \\ \times \quad 2 \\ \hline \\ \hline \end{array}$
11. $\begin{array}{r} 324.2 \\ \times \quad 14 \\ \hline \\ \hline \end{array}$
12. $\begin{array}{r} 5.6 \\ \times \quad 6 \\ \hline \\ \hline \end{array}$

13. 64.5 × 72 =
14. 6.2 × 7 =
15. 136.2 × 34 =
16. 22.6 × 84 =
17. 0.2 × 92 =
18. 126.2 × 15 =
19. 98.7 × 29 =
20. 8.4 × 52 =

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Kuzidisha desimali zenye nafasi mbili kwa namba nzima

Kuzidisha desimali zenye nafasi mbili, zidisha kama namba za kawaida kisha tenga nafasi mbili za desimali kwenye jibu kutoka kulia.

Mfano wa 1

$$\begin{array}{r} 1.02 \\ \times \quad 3 \\ \hline \\ \hline \end{array}$$

Hatua:

1. Zidisha kama namba za kawaida kama ifuatavyo:
   102 × 3 = 306
2. Tenga nafasi mbili katika jibu kutoka kulia, yaani 3.06.
   Kwa hiyo, 1.02 × 3 = 3.06.

Mfano wa 2

$$\begin{array}{r} 31.25 \\ \times \quad 26 \\ \hline 18750 \\ +\ 6250 \\ \hline 812.50 \\ \hline \end{array}$$

Hatua:

1. Zidisha kama kawaida kama ifuatavyo:
   3 125 × 26 = 81 250.
2. Tenga nafasi mbili za desimali kutoka kulia kwenye jibu, unapata 812.50.
   Kwa hiyo, 31.25 × 26 = 812.50.

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Mfano wa 3

$$\begin{array}{r} 212.5 \\ \times \quad 27 \\ \hline 14875 \\ +\ 4250 \\ \hline 5737.5 \\ \hline \end{array}$$

Zoezi la 9

Jibu maswali yafuatayo

1. 0.02 × 3 =
2. 1.13 × 2 =
3. 4.15 × 6 =
4. 2.38 × 7 =
5. 216.45 × 8 =
6. 1.83 × 4 =
7. 531.03 × 11 =
8. 342.35 × 15 =
9. 418.62 × 13 =
10. 274.24 × 17 =
11. 135.71 × 32 =
12. 386.08 × 22 =

13. $\begin{array}{r} 506.35 \\ \times \quad 28 \\ \hline \\ \hline \end{array}$

14. $\begin{array}{r} 3.49 \\ \times \quad 38 \\ \hline \\ \hline \end{array}$

15 $\begin{array}{r} 180.57 \\ \times \quad 19 \\ \hline \\ \hline \end{array}$

16. 0.08 × 29 =
17. 25.02 × 16 =
18. 336.01 × 4 =
19. 442.07 × 12 =
20. 38.27 × 12 =

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Zoezi la 10

Jibu maswali yafuatayo:

1. Andika kwa tarakimu:

(a) Moja nukta mbili (b) Sifuri nukta nne

(c) Sifuri nukta saba (d) Tatu nukta sita nane

(e) Ishirini na tano nukta mbili nane

2. Andika kwa maneno:

(a) 4.6 (b) 33.5 (c) 51.8

(d) 0.08 (e) 91.66 (f) 16.49

3. Badili sehemu zifuatazo kuwa desimali:

(a) $\frac{6}{10}$ (b) $\frac{17}{10}$ (c) $\frac{2}{10}$ (d) $\frac{83}{100}$

(e) $\frac{5}{100}$ (f) $\frac{108}{100}$ (g) $\frac{365}{100}$

4. 23.2 + 0.8 = **5.** 0.5 + 3.6 = **6.** 0.23 + 8.52 =

7. $\begin{array}{r} 38.5 \\ \times \quad 8 \\ \hline \\ \hline \end{array}$ **8.** $\begin{array}{r} 12.9 \\ \times \quad 44 \\ \hline \\ \hline \end{array}$ **9.** $\begin{array}{r} 180.57 \\ \times \quad 19 \\ \hline \\ \hline \end{array}$

10. $\begin{array}{r} 99.15 \\ \times \quad 86 \\ \hline \\ \hline \end{array}$ **11.** 19.9 – 14.5 =

12. 0.8 – 0.3 = **13.** 12.1 – 9.8 =

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14. 13.07 – 5.04 =

15. 87.25 – 64.96 =

16. 35.34 – 26.45 =

17. 2.3 × 22 =

18. 0.4 × 15 =

19. 0.45 × 13 =

20. 6.08 × 11 =

21. 30.25 × 14 =

22. 1.16 × 9 =

23. 5.02 × 6 =

24. 85.18 × 8 =

25. 27.58 × 31 =

Jikumbushe

1. Desimali husomwa kuanzia kushoto kuelekea kulia. Tarakimu zilizo kushoto mwa nukta husomwa kama namba za kawaida, na tarakimu za kulia mwa nukta husomwa mojamoja.
2. Kujumlisha na kutoa desimali, zingatia nafasi ya tarakimu kabla na baada ya nukta.
3. Kuzidisha desimali kwa namba nzima hufanyika kama namba za kawaida, kisha kutenga nafasi kulingana na viwango vya desimali vya namba husika ukianzia kulia kuelekea kushoto mwa jibu.

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Sura ya Kumi

Vipeo na vipeuo

Katika sura hii, utajifunza kutafuta namba mraba isiyozidi 10 000 na kipeo cha pili cha namba hadi 100. Pia, utajifunza kutafuta kipeuo cha pili cha namba mraba zenye tarakimu hadi tatu na kufumbua mafumbo yanayohusu kipeo na kipeuo cha pili cha namba.

Namba mraba

Mfano wa 1

Kutafuta namba mraba kwa kutumia idadi ya nukta

Chunguza mpangilio wa nukta katika jedwali lifuatalo:

(a) Katika kila seti, andika idadi ya nukta.
(b) Zidisha idadi ya nukta za ulalo na wima.
(c) Andika zao la idadi ya nukta za ulalo na wima.

mpangilio	idadi za nukta za ulalo × wima	zao
•	1 × 1	1
• • • •	2 × 2	4
• • • • • • • • •	3 × 3	9
• •	5 × 5	25

Katika mfano huu, namba mraba ni **1**, **4**, **9** na **25**.

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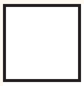
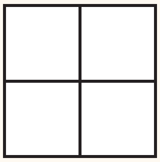
Kutafuta namba mraba kwa kutumia miraba

Mfano wa 2

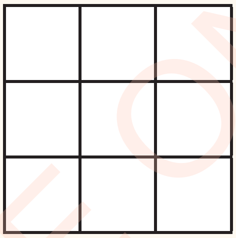
Chunguza idadi ya miraba midogo katika miraba mikubwa kisha angalia uhusiano kati ya miraba na namba mraba.



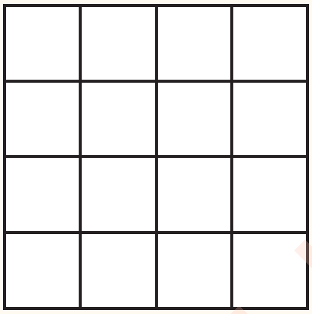
$1 \times 1 = 1$



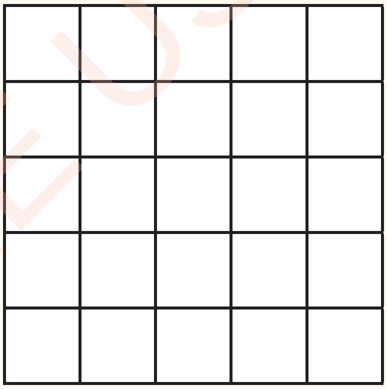
$2 \times 2 = 4$



$3 \times 3 = 9$



$4 \times 4 = 16$



$5 \times 5 = 25$

Idadi ya miraba midogo katika kila mraba mkubwa ndio namba mraba.

Kwa hiyo, namba mraba ni 1, 4, 9, 16 na 25.

Namba mraba ni namba inayopatikana kwa kuzidisha namba yenyewe kwa yenyewe.

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Mfano wa 3

Andika namba mraba ya namba zifuatazo:

(a) 7 (b) 10 (c) 11

Njia

(a) 7 × 7 = 49. Kwa hiyo, 49 ni namba mraba ya 7.

(b) 10 × 10 = 100. Kwa hiyo, 100 ni namba mraba ya 10.

(c) 11 × 11 = 121. Kwa hiyo, 121 ni namba mraba ya 11.

Zoezi la 1

Jibu maswali yafuatayo:

1. Tafuta zao la namba zifuatazo ili kupata namba mraba.

(a) 20 × 20 (b) 21 × 21 (c) 8 × 8
(d) 14 × 14 (e) 13 × 13

2. Andika namba mraba za namba zifuatazo:

(a) 6 (b) 15 (c) 73
(d) 9 (e) 31

3. Jaza nafasi zilizoachwa wazi.

(a) 81 = 9 × ____

(b) 144 = ___ × 12

(c) 625 = 25 × ___

(d) ____ = 16 × 16

(e) 961 = 31 × _____

4. Andika namba mraba mbili zinazokosekana katika mipangilio ifuatayo:

(a) 1, 4, 9, 16, 25, _____, _______

(b) 1, 9, 25, 49, _______, _______

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5. Zidisha kila moja ya namba hizi kwa yenyewe kisha tafsiri zao utakalopata.

(a) 53, 55, 57, 58 (b) 30, 33, 35 (c) 88, 89, 91

6. Orodhesha namba mraba zote zilizopo kati ya 70 na 150

7. Katika sentensi zifuatazo andika KWELI au SI KWELI.

(a) Namba mraba zote hugawanyika kwa 6.

(b) Ukizidisha namba kwa yenyewe unapata namba mraba.

Kipeo cha pili cha namba

Kuandika namba mraba katika kipeo cha pili

Namba mraba inaweza kuandikwa katika kipeo cha pili kama ifuatavyo:

(a) $9 = 3 \times 3 = 3^2$ ambayo husomwa tatu kipeo cha pili.

(b) $4 = 2 \times 2 = 2^2$ ambayo husomwa mbili kipeo cha pili.

(c) $16 = 4 \times 4 = 4^2$ ambayo husomwa nne kipeo cha pili.

(d) $49 = 7 \times 7 = 7^2$ ambayo husomwa saba kipeo cha pili.

Kwa hiyo, kipeo cha pili ni namba inayoonesha kuwa namba imezidishwa yenyewe kwa yenyewe.

Mfano

Andika namba zifuatazo katika kipeo cha pili.

(a) 144 (b) 81 (c) 121

Njia

(a) $144 = 12 \times 12$
$= 12^2$

(b) $81 = 9 \times 9$
$= 9^2$

(c) $121 = 11 \times 11$
$= 11^2$

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Zoezi la 2

Jibu maswali yafuatayo:

1. Andika namba zifuatazo katika kipeo cha pili.

(a) 6×6 (b) 9×9 (c) 15×15

2. Andika namba zifuatazo katika kipeo cha pili.

(a) 225 (b) 256 (c) 121 (d) 289

3. Tumia alama ya kuzidisha kuwakilisha namba zifuatazo. Kipengele (a) ni mfano.

(a) $14^2 = \underline{14} \times \underline{14}$ (d) $18^2 =$

(b) $10^2 =$ (e) $26^2 =$

(c) $37^2 =$

4. Andika namba zifuatazo kwa tarakimu bila kutafuta zao:

(a) Ishirini na tatu kipeo cha pili.

(b) Thelathini na tano kipeo cha pili.

(c) Kumi na saba kipeo cha pili.

(d) Arobaini na nne kipeo cha pili.

5. Jaza namba zinazokosekana.

(a) $2 \times 2 = ___ = 4$ (b) $___ \times ___ = ___ = 49$

(c) $___ \times ___ = 5^2 = ___$ (d) $___ \times ___ = 16^2 = ___$

6. Kamilisha jedwali lifuatalo:

Namba	6		9		1
Namba katika kipeo cha pili	6^2	11^2			
Namba mraba	36			169	

7. Tafuta zao la:

(a) 19^2 (b) 36^2 (c) 81^2

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Kipeuo cha pili cha namba

Namba ambayo ikizidishwa yenyewe kwa yenyewe na kupata namba mraba huitwa kipeuo cha pili cha hiyo namba mraba. Ili kutafuta kipeuo cha pili cha namba, alama $\sqrt{\ }$ hutumika. Kwa mfano $\sqrt{49}$ husomwa kipeuo cha pili cha 49.

$$\sqrt{49} = \sqrt{7 \times 7}$$
$$= 7$$

Kwa hiyo, $\sqrt{49} = 7$.

Mfano wa 1

Tafuta kipeuo cha pili cha:

(a) 25 (b) 9 (c) 100

Njia

(a) $\sqrt{25} = \sqrt{5 \times 5} = 5$

Kwa hiyo, 5 ni kipeuo cha pili cha 25 au 5^2.

(b) $\sqrt{9} = \sqrt{3 \times 3} = 3$

Kwa hiyo, 3 ni kipeuo cha pili cha 9 au 3^2.

(c) $\sqrt{100} = \sqrt{10 \times 10} = 10$

Kwa hiyo, 10 ni kipeuo cha pili cha 100 au 10^2.

Mfano wa 2

Tumia ngoe kutafuta kipeuo cha pili cha 64.

Njia

Kwa kutumia ngoe ya vigawo:

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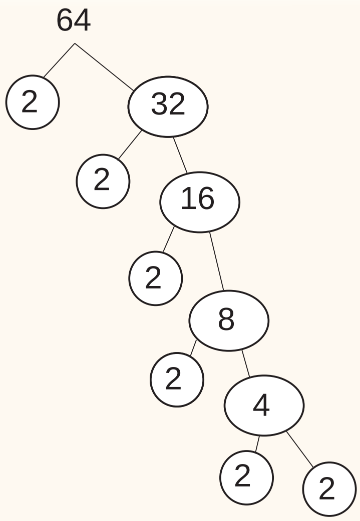

Hatua:

1. Andika kipeuo cha pili cha 64: $\sqrt{64}$
2. Zao la vigawo tasa vya 64 ni: $\sqrt{64} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2}$
3. Panga pamoja vigawo viwili viwili vinavyofanana: $\sqrt{64} = \sqrt{(2 \times 2) \times (2 \times 2) \times (2 \times 2)}$
4. Chukua kigawo kimoja katika kila jozi ya namba zinazofanana kisha zidisha $= 2 \times 2 \times 2$
$= 8.$

Kwa hiyo, $\sqrt{64} = 8$.

Mfano wa 3

Tafuta $\sqrt{676}$.

Hatua:

1. Gawanya kupata vigawo tasa vya 676.

2	676
2	338
13	169
13	13
	1

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2. Zao la vigawo tasa vya 676 ni; $\sqrt{676} = \sqrt{2 \times 2 \times 13 \times 13}$
3. Panga pamoja vigawo vinavyofanana; $= \sqrt{(2 \times 2) \times (13 \times 13)}$
4. Chukua kigawo kimoja katika kila jozi ya namba zinazofanana kisha zidisha.

$= 2 \times 13$

$= 26$

Kwa hiyo, $\sqrt{676} = 26$.

Zoezi la 3

Jibu maswali yafuatayo:

1. Tafuta kipeuo cha pili cha namba zifuatazo:

(a) 196 (c) 121
(b) 400 (d) 324

2. Tafuta kipeuo cha pili cha namba zifuatazo:

(a) 51× 51 (c) 73 × 73
(b) 15 × 15 (d) 99 × 99

3. Tafuta kipeuo cha pili cha namba zifuatazo kwa njia ya vigawo tasa:

(a) 729 (c) 625
(b) 529 (d) 784

4. Tumia njia ya ngoe ya vigawo kutafuta kipeuo cha pili cha namba zifuatazo:

(a) 81 (b) 676 (c) 961

5. Tafuta:

(a) $\sqrt{256}$ (b) $\sqrt{361}$

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Mafumbo ya vipeo na vipeuo

Mfano

Gari hubeba kreti 576 za soda. Kama kreti hizo zikipangwa katika idadi sawa ya mistari kwa urefu na upana, je, kila mstari utakuwa na kreti ngapi?

Njia

Mistari ina idadi sawa kwa urefu na upana.

Ili kupata idadi sawa ya mistari, tafuta $\sqrt{576}$

$$\sqrt{576} = \sqrt{2\times2\times2\times2\times2\times2\times3\times3}$$
$$= \sqrt{(2\times2)\times(2\times2)\times(2\times2)\times(3\times3)}$$
$$= 2 \times 2 \times 2 \times 3 = 24$$
$$= 24.$$

Kwa hiyo, kila mstari utakuwa na kreti 24.

Zoezi la 4

Jibu maswali yafuatayo:

1. Ikiwa mimi ni kipeo cha pili cha 13, mimi ni namba gani?
2. Kambi, Maria na Shelembi walitakiwa kuandika namba 25 kwa njia tofauti. Kambi aliandika 5^2, Maria aliandika 5×5 na Shelembi aliandika $\sqrt{625}$. Je, wote walikuwa sahihi? Toa sababu.
3. Umri wa John ni sawa na kipeuo cha pili cha 100. Je, umri wa John ni miaka mingapi?
4. Mwalimu Christina ana kuku ambao idadi yao ni sawa na kipeo cha pili cha 17. Je, mwalimu Christina ana kuku wangapi?

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5. Umri wa mtoto ukizidishwa wenyewe kwa wenyewe unapata umri wa baba yake. Ikiwa baba yake ana miaka 49, je, mtoto ana miaka mingapi?

Zoezi la 5

Jibu maswali yafuatayo:

1. Jaza namba mbili zinazokosekana.

(a) 25, 36, 49, 64 _____, _____.

(b) 121, 169, 225, 289, 361, ____, ____.

2. Nakili na kamilisha jedwali lifuatalo kisha jaza nafasi zilizoachwa wazi.

Namba	3			23		31
Namba katika kipeo cha pili	3^2	18^2		23^2		31^2
Namba mraba	9		441		625	

3. Zifuatazo ni namba mraba za namba gani?

(a) 1 (b) 49 (c) 225 (d) 400

4. Orodhesha namba zote mraba kati ya 2 na 98.

5. Jaza nafasi zilizoachwa wazi.

(a) 400 = 20 × ____

(b) ____ = 15 × 15

(c) 169 = _____ × 13

6. Jaza namba mbili zilizokosekana katika mfuatano.

(a) 16, 25, 36, 49, 64, ___, ____.

(b) 64, 100, 144, _____, _____.

(c) 25, 49, 81, _____, ____.

(d) 225, 289, 361, 441, 529, _____, _____.

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7. Tafuta kipeuo cha pili cha 841.

8. (a) Kokotoa $\sqrt{625}$, $\sqrt{576}$, $\sqrt{961}$ na $\sqrt{729}$

(b) Panga majibu ya kipengele (a) kuanzia ndogo hadi kubwa.

9. Tafuta kipeuo cha pili cha namba zifuatazo kwa kutumia ngoe:

(a) 196 (b) 225 (c) 441 (d) 841 (e) 900

10. Tafuta kipeuo cha pili cha namba zifuatazo kwa kutumia vigawo tasa:

(a) 81 (b) 169 (c) 289 (d) 256 (e) 576

11. Ni namba gani ambayo kipeo chake cha pili ni mia mbili themanini na tisa?

12. Umri wa Tumaini ni sawa na kipeuo cha pili cha mia moja arobaini na nne. Tumaini ana umri wa miaka mingapi?

Jikumbushe

1. Namba inayopatikana kwa kuzidisha yenyewe kwa yenyewe inaitwa namba mraba.
2. Kipeo cha pili cha namba ni namba inayoonesha kuwa namba imezidishwa yenyewe kwa yenyewe.
3. Kipeuo cha pili cha namba ni namba ambayo ikizidishwa kwa yenyewe huzaa namba mraba.
4. Alama $\sqrt{}$ hutumika badala ya neno kipeuo cha pili cha namba.

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Sura ya Kumi na Moja

Wakati

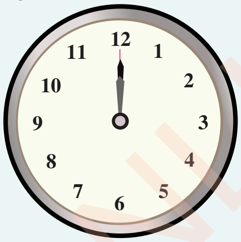
Ulipokuwa Darasa la Nne, ulijifunza kusoma, kuandika, kujumlisha na kutoa muda katika saa na dakika. Katika sura hii, utajifunza kubadili, kuzidisha na kugawanya vipimo vya wakati. Pia, utajifunza kutengeneza kalenda.

Zoezi la 1: Marudio

Jibu maswali yafuatayo:

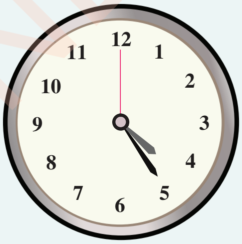
1. Soma nyuso za saa zifuatazo kisha andika muda kwa tarakimu na kwa maneno:

(a)



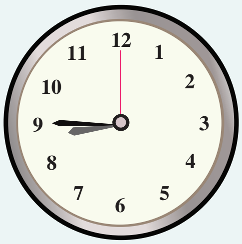
____

(b)



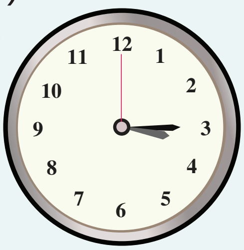
____

(c)



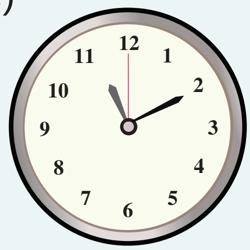
____

(d)



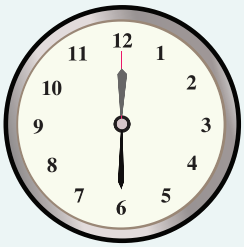
____

(e)



____

(f)



____

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2. Chora nyuso za saa kisha weka mishale kuonesha muda uliooneshwa.
(a) Saa sita na robo (6:15)
(b) Saa kumi kamili (10:00)
(c) Saa mbili na nusu (2:30)
(d) Saa tatu na dakika arobaini na tano (3:45)
(e) Saa tano na dakika tano (5:05)

3. Andika muda ufuatao kwa maneno.
(a) 8:15 __________ (b) 1:20 __________
(c) 11:30 __________ (d) 2: 45 __________

4.

	saa	dakika
	2	10
+	4	25

5.

	saa	dakika
	9	44
+	1	10

6.

	saa	dakika
	3	10
+	5	50

7.

	saa	dakika
	4	30
–	2	20

8.

	saa	dakika
	8	48
–	3	40

9.

	saa	dakika
	6	30
+	4	40

10.

	saa	dakika
	3	32
–	2	05

11.

	saa	dakika
	9	00
–	5	30

12.

	saa	dakika
	7	46
–	1	22

13.

	saa	dakika
	5	12
+	1	49

14. Wanafunzi walianza kufanya mtihani saa 3:15 asubuhi na kumaliza saa 4:45 asubuhi. Je, walitumia muda gani kufanya mtihani huo?

15. Mwanariadha alianza kukimbia mbio saa 2:55 asubuhi. Iwapo alitumia saa moja na dakika arobaini kumaliza mbio, alimaliza saa ngapi?

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Kutengeneza kalenda

Kalenda huonesha siku, wiki, mwezi na mwaka. Pia, tarehe za matukio muhimu ya kitaifa na kidini huoneshwa katika kalenda. Chunguza kalenda ifuatayo, kisha baini yaliyomo katika kalenda.

KALENDA YA MWAKA 2019

JANUARI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

FEBRUARI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

MACHI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

APRILI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

MEI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

JUNI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

JULAI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

AGOSTI

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

SEPTEMBA

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

OKTOBA

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

NOVEMBA

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

DESEMBA

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

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1. Kalenda ya mwaka huonesha miezi kumi na mbili.
2. Majina ya miezi hiyo ni Januari, Februari, Machi, Aprili, Mei, Juni, Julai, Agosti, Septemba, Oktoba, Novemba na Desemba.
3. Ipo miezi yenye siku 31, 30 na 28 au 29.

Mwezi Februari una siku 28 kwa mwaka mfupi au 29 kwa mwaka mrefu.
Mwaka mrefu ni ule unaogawanyika kwa 4. Mwaka mfupi ni ule usiogawanyika kwa 4. Kwa mfano, mwaka 2016 ulikuwa mwaka mrefu (2016 ÷ 4 = 504), lakini mwaka 2017 ulikuwa mwaka mfupi (2017 ÷ 4 = 504 baki 1).

Kusoma kalenda ya mwaka na kuandika tarehe

Kusoma kalenda

Mfano wa 1

Andika majina ya miezi yenye siku 30.
Jibu: Miezi yenye siku 30 ni Aprili, Juni, Septemba na Novemba.

Mfano wa 2

Andika majina ya siku katika wiki.
Jibu: Majina ya siku katika wiki ni Jumatatu, Jumanne, Jumatano, Alhamisi, Ijumaa, Jumamosi na Jumapili.

Kuandika tarehe

Unapoandika tarehe, anza kuandika siku, kisha mwezi, halafu mwaka.

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Tarehe huandikwa kwa kutumia maneno au kwa kutenganisha namba zinazowakilisha siku, mwezi na mwaka kwa kutumia alama ya nukta (.), mkwaju (/) au deshi (–).

Kuandika tarehe kwa maneno

Mfano

Andika tarehe 1/1/2018 kwa maneno.

Jibu:

Tarehe moja mwezi Januari mwaka elfu mbili na kumi na nane au tarehe moja mwezi wa kwanza mwaka elfu mbili na kumi na nane.

Kuandika tarehe kwa kutenga

Mfano wa 1

Andika tarehe 20 Februari, 2018 kwa kutenga siku, mwezi na mwaka kwa kutumia nukta.

Jibu: Tarehe 20.2.2018

Husomwa, tarehe ishirini mwezi Februari mwaka elfu mbili na kumi na nane au tarehe ishirini mwezi wa pili mwaka elfu mbili na kumi na nane.

Mfano wa 2

Andika tarehe 20.2.2018 kwa kutumia mkwaju.

Jibu: Tarehe 20/2/2018

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Mfano wa 3

Andika tarehe tatu mwezi Mei mwaka elfu mbili na kumi na tisa kwa kutumia alama ya deshi.

Jibu: 3 - 5 - 2019

Zoezi la 2

Jibu maswali yafuatayo:

1. Andika majina ya miezi yenye siku 31.
2. Kuna Jumapili ngapi katika mwezi Julai mwaka huu?
3. Andika tarehe ya Jumatatu ya kwanza ya mwezi Juni mwaka huu kwa maneno.
4. Andika tarehe ya Jumatano ya mwisho ya mwezi Januari mwaka huu kwa kutenga kwa kutumia nukta.
5. Tarehe 28/2 ya mwaka huu ni siku gani?

Kutengeneza na kusoma kalenda ya mwezi

Mwezi mmoja una wiki 4 na kila wiki ina siku 7.
Majina ya siku katika wiki ni Jumatatu, Jumanne, Jumatano, Alhamisi, Ijumaa, Jumamosi na Jumapili.
Tengeneza kalenda ya mwezi mmoja.

Hatua:

1. Chora umbo la mstatili.
2. Ndani ya mstatili huo chora mistari sita ya wima na mitano ya ulalo. Unapata mistatili midogo midogo.
3. Andika majina ya siku kuanzia Jumatatu, kutoka kushoto kuelekea kulia katika mistatili ya mwanzo ya ulalo.

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4. Angalia tarehe ya mwisho ya mwezi uliotangulia ilikuwa ni siku gani.
5. Anza kuandika namba 1 inayowakilisha siku ya kwanza ya mwezi unaofuata.
6. Endelea kuandika namba kwa mfululizo hadi siku ya mwisho ya mwezi huo.

Kalenda ya mwezi Oktoba 2019

Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi	Jumapili
	1	2	3	4	5	**6**
7	8	9	10	11	12	**13**
14	15	16	17	18	19	**20**
21	22	23	24	25	26	**27**
28	29	30	31			

Zoezi la 3

Jibu maswali yafuatayo:

1. Tengeneza kalenda ya mwezi Novemba mwaka huu kisha jibu maswali yafuatayo:
   (a) Tarehe 30 ni siku gani?
   (b) Jumapili ya kwanza ya mwezi huo ilikuwa ni tarehe ngapi?

2. Tengeneza kalenda ya mwezi Machi mwaka huu. Kisha jibu maswali yafuatayo:
   (a) Tarehe 28 ni siku gani?
   (b) Andika tarehe ya Ijumaa ya pili ya mwezi huo.

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3. Liliani ni muuguzi katika hospitali ya Mawenzi, alianza likizo tarehe 28/5/2018 na kurudi kazini tarehe 25/6/2018. Je, likizo yake ilikuwa ya siku ngapi?
4. Katika miaka ya 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003 na 2004:
   (a) Orodhesha miaka mirefu.
   (b) Orodhesha miaka mifupi.
5. Adamu alihudhuria mafunzo ya utunzaji wa mazingira kwa miezi sita. Iwapo mafunzo yalianza tarehe 1/2/2015, alihitimu mafunzo hayo tarehe gani?

Kubadili vipimo vya wakati

Unapobadili vipimo vya wakati, zingatia uhusiano uliopo kati ya kipimo kimoja na kingine.

Uhusiano wa vipimo vya wakati

Saa 1 = dakika 60

Siku 1 = saa 24

Wiki 1 = siku 7

Mwezi 1 = wiki 4

Mwaka 1 = wiki 52

Mwaka 1 = miezi 12

Mwaka mrefu = siku 366

Mwaka mfupi = siku 365

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Mfano

1. Kuna siku ngapi katika saa 72?

Njia

Siku moja ina saa 24

Saa 72 ni siku 72 ÷ 24 = siku 3

Saa 72 = siku 3

Kwa hiyo, kuna siku 3 katika saa 72.

2. Kuna wiki ngapi katika siku 91?

Njia

Wiki 1 ina siku 7

Siku 91 ni wiki 91 ÷ 7 = wiki 13

Kwa hiyo, kuna wiki 13 katika siku 91.

3. Kuna siku ngapi katika miaka mitatu mirefu?

Njia

Mwaka mrefu una siku 366

Miaka mitatu mirefu ina siku 366 x 3 = siku 1098

Kwa hiyo, kuna siku 1098 katika miaka mitatu mirefu.

4. Juma alitembea mita 1000 kwa dakika 15. Badili dakika hizo kuwa katika saa.

Njia

Gawanya dakika 15 kwa 60; 15 ÷ 60 = $\frac{15}{60}$

Rahisisha $\frac{15}{60} = \frac{1}{4}$

Hivyo, dakika 15 ni sawa na $\frac{1}{4}$ saa.

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Zoezi la 4

Jibu maswali yafuatayo:

1. Kuna wiki na siku ngapi katika siku zifuatazo:
   (a) 48 (b) 60 (c) 19
   (d) 112 (e) 705
2. Badili muda ufuatao kuwa siku.
   (a) Wiki 12 siku 1 (b) Wiki 36 siku 6
   (c) Wiki 72 siku 4 (d) Wiki 80
3. Daraja lilijengwa kwa siku 34. Je, muda huo ni sawa na wiki na siku ngapi?
4. Basi lilisafiri kwa muda wa saa 72. Je, basi hilo lilisafiri kwa muda wa siku ngapi?
5. Mchicha katika bustani ya mboga ulichukua siku 30 hadi kukomaa. Muda huu ni sawa na wiki na siku ngapi?
6. Badili dakika 360 kuwa saa.
7. Siku moja ina dakika ngapi?
8. Badili saa 28 kuwa siku.
9. Badili saa 70 kuwa dakika.
10. Kuna saa ngapi katika siku 10?

Kuzidisha vipimo vya wakati

Unapozidisha vipimo vya wakati, zidisha muda uliopewa kwa namba. Anza kuzidisha kipimo kidogo kisha kipimo kikubwa.

Kuzidisha: Saa na dakika

Kuzidisha ni sawa na kujumlisha kwa kujirudiarudia.

Saa 1= dakika 60

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Mfano wa 1

saa	dakika
2	10
×	3

Hatua:

1. Dakika 10 × 3 = dakika 30. Andika 30 katika nafasi ya dakika.

saa	dakika
2	10
×	3
	30

2. Saa 2 × 3 = saa 6. Andika 6 katika nafasi ya saa.

saa	dakika
2	10
×	3
6	30

Kwa hiyo, jibu ni saa 6 na dakika 30.

Mfano wa 2

saa	dakika
7	21
×	4

Hatua:

1. Dakika 21 × 4 = dakika 84.
   Saa 1 = dakika 60. Hivyo dakika 84 = saa 1 na dakika 24. Andika 24 katika nafasi ya dakika, kisha jumlisha saa 1 na zao la saa.

saa	dakika
7	21
×	4
	24

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2. Saa 7 × 4 = saa 28.
Jumlisha: Saa 1 + saa 28 = saa 29.
Andika 29 katika nafasi ya saa.

	saa	dakika
	7	21
×		4
	29	24

Kwa hiyo, jibu ni saa 29 na dakika 24.

Mfano wa 3

	saa	dakika
	5	16
×		6
	31	36

Zoezi la 5

Jibu maswali yafuatayo:

1.

	saa	dakika
	4	10
×		2

2.

	saa	dakika
	3	15
×		3

3.

	saa	dakika
	6	13
×		5

4.

	saa	dakika
	7	23
×		4

5.

	saa	dakika
	4	16
×		6

6.

	saa	dakika
	1	05
×		8

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7.	saa	dakika
	6	20
×		3

8.	saa	dakika
	2	12
×		9

9.	saa	dakika
	7	05
×		3

10.	saa	dakika
	10	00
×		2

Kuzidisha: Siku na saa

Siku 1 = saa 24

Mfano wa 1

	siku	saa
	4	3
×		7

Hatua:

1. Saa 3 × 7 = saa 21. Andika 21 katika nafasi ya saa.

	siku	saa
	4	3
×		7
		21

2. Siku 4 × 7 = siku 28. Andika 28 katika nafasi ya siku.

	siku	saa
	4	3
×		7
	28	21

Kwa hiyo, jibu ni siku 28 na saa 21.

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Mfano wa 2

	siku	saa
	6	12
×		4

Hatua:

1. Saa 12 × 4 = saa 48.

   Siku 1 = saa 24. Hivyo, saa 48 = siku 2.
   Andika 0 katika nafasi ya saa, kisha jumlisha siku 2 na zao la siku.

	siku	saa
	6	12
×		4
		0

2. Siku 6 × 4 = siku 24.

   Jumlisha: Siku 2 + siku 24 = siku 26.
   Andika 26 katika nafasi ya siku.

	siku	saa
	6	12
×		4
	26	0

Kwa hiyo, jibu ni siku 26.

Mfano wa 3

	siku	saa
	8	20
×		2
	17	16

Zoezi la 6

Jibu maswali yafuatayo:

1.

	siku	saa
	5	10
×		2

2.

	siku	saa
	11	9
×		3

3.

	siku	saa
	8	11
×		5

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4.

	siku	saa
	24	5
×		4

5.

	siku	saa
	15	15
×		3

6.

	siku	saa
	10	10
×		6

7.

	siku	saa
	8	22
×		10

8.

	siku	saa
	7	7
×		7

9.

	siku	saa
	11	1
×		15

10.

	siku	saa
	20	4
×		9

Kuzidisha: Wiki na siku

Wiki 1 = siku 7

Mfano wa 1

	wiki	siku
	2	2
×		3

Hatua:

1. Siku 2 × 3 = siku 6. Andika 6 katika nafasi ya siku.

	wiki	siku
	2	2
×		3
		6

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2. Wiki 2 × 3 = wiki 6. Andika 6 katika nafasi ya wiki.

	wiki	siku
	2	2
×		3
	6	6

Kwa hiyo, jibu ni wiki 6 na siku 6.

Mfano wa 2

	wiki	siku
	5	3
×		4

Hatua:

1. Siku 3 × 4 = siku 12.
   Wiki 1 = siku 7. Hivyo, siku 12 = wiki 1 na siku 5. Andika 5 katika nafasi ya siku, kisha jumlisha wiki 1 na zao la wiki.

	wiki	siku
	5	3
×		4
		5

2. Wiki 5 × 4 = wiki 20.
   Jumlisha: Wiki 1 + wiki 20 = wiki 21, kisha andika 21 katika nafasi ya wiki.

	wiki	siku
	5	3
×		4
	21	5

Kwa hiyo, jibu ni wiki 21 na siku 5.

Mfano wa 3

	wiki	siku
	10	6
×		6
	65	1

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Zoezi la 7

Jibu maswali yafuatayo:

1.

wiki	siku
7	1
×	6

2.

wiki	siku
3	3
×	3

3.

wiki	siku
5	4
×	7

4.

wiki	siku
11	6
×	2

5.

wiki	siku
17	2
×	3

6.

wiki	siku
10	5
×	4

7.

wiki	siku
7	4
×	6

8.

wiki	siku
12	4
×	5

9.

wiki	siku
2	2
×	9

10.

wiki	siku
1	5
×	5

Kuzidisha: Miaka na wiki

Mwaka 1 = wiki 52

Mfano wa 1

miaka	wiki
8	6
×	5

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Hatua:

1. Wiki 6 × 5 = wiki 30. Andika 30 katika nafasi ya wiki.

miaka	wiki
8	6
×	5
	30

2. Miaka 8 × 5 = miaka 40. Andika 40 katika nafasi ya miaka.

miaka	wiki
8	6
×	5
40	30

Kwa hiyo, jibu ni miaka 40 na wiki 30.

Mfano wa 2

miaka	wiki
5	21
×	4

Hatua:

1. Wiki 21 × 4 = wiki 84.
Mwaka 1 = wiki 52. Hivyo, wiki 84 = mwaka 1 na wiki 32. Andika 32 katika nafasi ya wiki, kisha jumlisha mwaka 1 na zao la mwaka.

miaka	wiki
5	21
×	4
	32

2. Miaka 5 × 4 = miaka 20.
Jumlisha miaka: 1 + 20 = 21.
Andika 21 katika nafasi ya miaka.
Kwa hiyo, jibu ni miaka 21 na wiki 32.

miaka	wiki
5	21
×	4
21	32

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Mfano wa 3

	miaka	wiki
	3	25
×		4
	13	48

Zoezi la 8

Jibu maswali yafuatayo:

1.

	miaka	wiki
	10	10
×		5

2.

	miaka	wiki
	14	7
×		8

3.

	miaka	wiki
	34	5
×		5

4.

	miaka	wiki
	25	30
×		6

5.

	miaka	wiki
	35	4
×		8

6.

	miaka	wiki
	24	15
×		6

7.

	miaka	wiki
	15	15
×		5

8.

	miaka	wiki
	175	11
×		4

9.

	miaka	wiki
	50	0
×		4

10.

	miaka	wiki
	20	6
×		9

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Kuzidisha: Miaka na miezi

Mwaka 1 = miezi 12

Mfano wa 1

miaka	miezi
1	4
×	2

Hatua:

1. Miezi 4 × 2 = miezi 8. Andika 8 katika nafasi ya miezi.

miaka	miezi
1	4
×	2
	8

2. Miaka 1 × 2 = miaka 2. Andika 2 katika nafasi ya miaka.

miaka	miezi
1	4
×	2
2	8

Kwa hiyo, jibu ni miaka 2 na miezi 8.

Mfano wa 2

miaka	miezi
3	2
×	8

Hatua:

1. Miezi 2 × 8 = miezi 16.
Mwaka 1 = miezi 12. Hivyo, miezi 16 = mwaka 1 na miezi 4. Andika 4 katika nafasi ya miezi, kisha jumlisha mwaka 1 na zao la mwaka.

miaka	miezi
3	2
×	8
	4

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2. Miaka 3 × 8 = miaka 24.
Jumlisha miaka: 1 + 24 = 25.
Andika 25 katika nafasi ya miaka.

miaka	miezi
3	2
×	8
25	4

Kwa hiyo, jibu ni miaka 25 na miezi 4.

Mfano wa 3

miaka	miezi
6	5
×	6
38	6

Zoezi la 9

Jibu maswali yafuatayo:

1.

miaka	miezi
5	2
×	4

2.

miaka	miezi
11	8
×	2

3.

miaka	miezi
9	3
×	7

4.

miaka	miezi
15	10
×	6

5.

miaka	miezi
22	11
×	3

6.

miaka	miezi
18	8
×	8

7.

miaka	miezi
20	7
×	5

8.

miaka	miezi
16	4
×	4

9.

miaka	miezi
12	10
×	2

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10. miaka miezi

	miaka	miezi
	30	1
×		6

Kugawanya vipimo vya wakati

Kugawanya: Saa na dakika

Unapogawanya muda katika saa na dakika, zingatia kuwa dakika 60 = saa 1. Unapogawanya wakati anza na kipimo kikubwa kwenda kipimo kidogo.

Mfano wa 1

	saa	dakika
3)	12	45

Hatua:

1. Gawanya saa 12 kwa 3, unapata saa 4. Andika 4 katika nafasi ya saa.

	saa	dakika
3)	12	45
	4	

2. Gawanya dakika 45 kwa 3, unapata dakika 15. Andika 15 katika nafasi ya dakika.

	saa	dakika
3)	12	45
	4	15

Kwa hiyo, jibu ni saa 4 na dakika 15.

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Mfano wa 2

	saa	dakika
3)	22	24

Hatua:

1. Gawanya saa 22 kwa 3, unapata saa 7 baki saa 1. Andika 7 katika nafasi ya saa, kisha badili saa 1 kuwa dakika. Saa 1 = dakika 60. Jumlisha dakika 60 na dakika 24, unapata dakika 84.

	saa	dakika
3)	22	24
	7	

2. Gawanya dakika 84 kwa 3, unapata dakika 28. Andika 28 katika nafasi ya dakika.

	saa	dakika
3)	22	24
	7	28

Kwa hiyo, jibu ni saa 7 na dakika 28.

Mfano wa 3

	saa	dakika
7)	30	20
	4	20

Zoezi la 10

Jibu maswali yafuatayo:

1.

	saa	dakika
5)	15	20

2.

	saa	dakika
3)	14	15

3.

	saa	dakika
12)	125	24

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4. saa dakika

$5\overline{)10 \quad 40}$

5. saa dakika

$4\overline{)30 \quad 20}$

6. saa dakika

$5\overline{)44 \quad 15}$

7. saa dakika

$7\overline{)47 \quad 50}$

8. saa dakika

$5\overline{)24 \quad 40}$

Kugawanya: Siku na saa

Unapogawanya muda katika siku na saa, zingatia uhusiano uliopo kati ya siku na saa kwamba, siku 1 = saa 24.

Mfano wa 1

siku saa

$5\overline{)15 \quad 20}$

Hatua:

1. Gawanya siku 15 kwa 5, unapata siku 3. Andika 3 katika nafasi ya siku.

siku saa

$5\overline{)15 \quad 20}$

3

2. Gawanya saa 20 kwa 5, unapata saa 4. Andika 4 katika nafasi ya saa.

siku saa

$5\overline{)15 \quad 20}$

3 4

Kwa hiyo, jibu ni siku 3 na saa 4.

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Mfano wa 2

	siku	saa
4)	38	4

Hatua:

1. Gawanya siku 38 kwa 4, unapata siku 9 baki siku 2. Andika 9 katika nafasi ya siku, kisha badili siku 2 kuwa saa. Siku 2 = saa 48. Jumlisha saa 48 na saa 4, unapata saa 52.

	siku	saa
4)	38	4
	9	

2. Gawanya saa 52 kwa 4, unapata saa 13. Andika 13 katika nafasi ya saa.

	siku	saa
4)	38	4
	9	13

Kwa hiyo, jibu ni siku 9 na saa 13.

Mfano wa 3

	siku	saa
5)	85	15
	17	3

Zoezi la 11

Jibu maswali yafuatayo:

1.

	siku	saa
4)	8	12

2.

	siku	saa
5)	10	5

3.

	siku	saa
8)	15	16

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4. siku saa

5) 14 9

5. siku saa

7) 15 18

6. siku saa

13) 18 10

7. siku saa

6) 15 0

8. siku saa

10) 24 4

9. siku saa

8) 32 8

10. siku saa

7) 18 9

Kugawanya: Wiki na siku

Unapogawanya muda katika wiki na siku zingatia kuwa wiki 1 ni sawa na siku 7.

Mfano wa 1

wiki siku

4) 48 4

Hatua:

1. Gawanya wiki 48 kwa 4, unapata wiki 12. Andika 12 katika nafasi ya wiki.

wiki siku

4) 48 4

12

2. Gawanya siku 4 kwa 4, unapata siku 1. Andika 1 katika nafasi ya siku.

wiki siku

4) 48 4

12 1

Kwa hiyo, jibu ni wiki 12 na siku 1.

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Mfano wa 2

	wiki	siku
10)	51	3

Hatua:

1. Gawanya wiki 51 kwa 10, unapata wiki 5 baki wiki 1. Andika 5 katika nafasi ya wiki. Badili wiki 1 kuwa siku, unapata siku 7. Jumlisha siku 7 na siku 3, unapata siku 10.

	wiki	siku
10)	51	3
	5	

2. Gawanya siku 10 kwa 10, unapata siku 1. Andika 1 katika nafasi ya siku.

	wiki	siku
10)	51	3
	5	1

Kwa hiyo, jibu ni wiki 5 na siku 1.

Mfano wa 3

	wiki	siku
5)	16	13
	3	4

Zoezi la 12

Jibu maswali yafuatayo:

1.

	wiki	siku
3)	33	3

2.

	wiki	siku
5)	45	5

3.

	wiki	siku
17)	72	6

4.

	wiki	siku
9)	16	5

5.

	wiki	siku
8)	35	3

6.

	wiki	siku
6)	13	5

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7. wiki siku

$$9\overline{)\,28 \quad 2}$$

8. wiki siku

$$4\overline{)\,30 \quad 6}$$

9. wiki siku

$$15\overline{)\,240 \quad 0}$$

10. wiki siku

$$20\overline{)\,142 \quad 6}$$

Kugawanya: Miaka na wiki

Unapogawanya muda katika miaka na wiki, zingatia kuwa mwaka 1 ni sawa na wiki 52.

Mfano wa 1

miaka wiki

$$6\overline{)\,24 \quad 12}$$

Hatua:

1. Gawanya miaka 24 kwa 6, unapata miaka 4. Andika 4 katika nafasi ya miaka.

miaka wiki

$$\begin{array}{r|rr} & 24 & 12 \\ 6 & & \\ \hline & 4 & \end{array}$$

2. Gawanya wiki 12 kwa 6, unapata wiki 2. Andika 2 katika nafasi ya wiki.

miaka wiki

$$\begin{array}{r|rr} & 24 & 12 \\ 6 & & \\ \hline & 4 & 2 \end{array}$$

Kwa hiyo, jibu ni miaka 4 na wiki 2.

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Mfano wa 2

	miaka	wiki
6)	99	12

Hatua:

1. Gawanya miaka 99 kwa 6, unapata miaka 16 baki miaka 3. Andika 16 katika nafasi ya miaka, kisha badili miaka 3 kuwa wiki.
   Miaka 3 = wiki 52 × 3 = wiki 156.
   Jumlisha wiki 156 na wiki 12, unapata wiki 168.

	miaka	wiki
6)	99	12
	16	

2. Gawanya wiki 168 kwa 6, unapata wiki 28. Andika 28 katika nafasi ya wiki.

	miaka	wiki
6)	99	12
	16	28

Kwa hiyo, jibu ni miaka 16 na wiki 28.

Mfano wa 3

	miaka	wiki
5)	44	12
	8	44

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Zoezi la 13

Jibu maswali yafuatayo:

1. miaka wiki
   2) 74 42

2. miaka wiki
   6) 480 18

3. miaka wiki
   4) 17 8

4. miaka wiki
   52) 104 0

5. miaka wiki
   47) 124 38

6. miaka wiki
   8) 60 0

7. miaka wiki
   5) 54 12

8. miaka wiki
   11) 670 30

9. miaka wiki
   12) 125 4

10. miaka wiki
    17) 365 9

Kugawanya: Miaka na miezi

Unapogawanya wakati katika miaka na miezi, zingatia kuwa mwaka 1 ni sawa na miezi 12.

Mfano wa 1

miaka miezi
2) 6 8

Hatua:

1. Gawanya miaka 6 kwa 2, unapata miaka 3. Andika 3 katika nafasi ya miaka.

miaka miezi
2) 6 8
3

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2. Gawanya miezi 8 kwa 2, unapata miezi 4. Andika 4 katika nafasi ya miezi.

	miaka	miezi
2)	6	8
	3	4

Kwa hiyo, jibu ni miaka 3 na miezi 4.

Mfano wa 2

	miaka	miezi
5)	98	4

Hatua:

1. Gawanya miaka 98 kwa 5, unapata miaka 19 baki miaka 3. Andika 19 katika nafasi ya miaka, kisha badili miaka 3 kuwa miezi.
   Miaka 3 x 12 = miezi 36. Jumlisha miezi 36 na miezi 4, unapata miezi 40.

	miaka	miezi
5)	98	4
	19	

2. Gawanya miezi 40 kwa 5, unapata miezi 8. Andika 8 katika nafasi ya miezi.

	miaka	miezi
5)	98	4
	19	8

Kwa hiyo, jibu ni miaka 19 na miezi 8.

Mfano wa 3

	miaka	miezi
9)	98	3
	10	11

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Zoezi la 14

Jibu maswali yafuatayo:

1. miaka miezi

7) 98 7

2. miaka miezi

8) 87 4

3. miaka miezi

5) 98 9

4. miaka miezi

10) 105 10

5. miaka miezi

15) 51 3

6. miaka miezi

11) 115 6

7. miaka miezi

18) 216 0

8. miaka miezi

21) 127 9

9. miaka miezi

8) 1866 8

10. miaka miezi

11) 440 0

Zoezi la 15

Jibu maswali yafuatayo:

1.

siku	saa
4	2
×	4

2.

siku	saa
10	15
×	2

3.

wiki	siku
2	5
×	6

4.

wiki	siku
12	14
×	5

5.

miaka	wiki
17	19
×	13

6.

miaka	wiki
20	40
×	10

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7. Badili muda ufuatao kuwa dakika.

(a) Saa 7 (b) Saa $4\frac{1}{2}$ (c) Saa $2\frac{1}{2}$

8. Upi ni mwaka mrefu kati ya miaka 2008, 2009, 2010 na 2011?

9. Badili saa 48 kuwa siku.

10.

$$\begin{array}{r|ll} & \text{siku} & \text{saa} \\ 5 & 16 & 11 \end{array}$$

11. Badili saa 124 kupata siku na saa.

12. Lusia alimtembelea dada yake Fausta. Alikaa naye kwa muda wa saa 144. Je, hizo ni sawa na siku ngapi?

13. Andika jumla ya siku katika miezi ya Juni, Julai na Agosti.

14. Kuna miaka na miezi mingapi katika miezi 65?

15. Mwanafunzi alitakiwa kusoma somo la Hisabati kwa mwaka mzima wa 2017 shuleni. Iwapo alipumzika mwezi Juni na Desemba, je, alisoma kwa siku ngapi kwa mwaka huo?

16. Mwaka ambao mwezi Februari una siku 29 hujulikana kama mwaka ___________ .

17. Katika mzunguko wa mwaka, andika miezi ambayo inafuatana na kila mmoja una siku 31.

18. Mwezi Aprili una wiki na siku ngapi?

19. Katika miaka 2000 na 2006, upi ulikuwa una siku chache zaidi?

20. Treni iliondoka Dar es Salaam kwenda Mwanza siku ya Alhamisi saa 8 mchana na kusafiri kwa muda wa saa 58 hadi Mwanza. Je, treni ilifika siku gani?

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Jikumbushe

1. Unapozidisha vipimo vya wakati kwa namba, anza kuzidisha kipimo kidogo. Zao linapozidi au kufikia kipimo kikubwa badili kipimo hicho.
2. Unapogawanya vipimo vya wakati, zingatia uhusiano uliopo kati ya vipimo hivyo. Unapogawanya vipimo vya wakati, anza kugawanya kipimo kikubwa.
3. Mwaka unaogawanyika kwa 4 ni mwaka mrefu na huwa na siku 29 kwa mwezi Februari.
4. Mwaka usiogawanyika kwa 4 ni mwaka mfupi na huwa na siku 28 kwa mwezi Februari.

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Sura ya Kumi na Mbili

Vipimo vya metriki

Ulipokuwa Darasa la Nne, ulijifunza kubadili vipimo vya metriki vya urefu, uzani na ujazo. Katika sura hii, utajifunza kubadili, kujumlisha na kutoa vipimo vya urefu, uzani na ujazo.

Zoezi la 1 Marudio

Jibu maswali yafuatayo:

1. Oanisha maneno yanayofaa zaidi kutoka kifungu A na yale yaliyo kifungu B ili kuleta maana:

	Kifungu A	**Kifungu B**
(a)	Kipimo cha mchele	Vipimo vya metriki
(b)	Kipimo cha urefu wa penseli	Mililita
(c)	Meta, kilogramu, lita	Sentimeta
(d)	Kipimo cha maziwa	Kilometa
(e)	Kipimo kikubwa cha urefu	Uzani

2. Badili kuwa gramu.

   (a) kg 2 (b) kg 45 (c) kg 8

3. Eliza hutembea km 3 m 500 asubuhi na km 2 m 500 jioni. Eliza hutembea umbali gani kwa siku?

4. Badili kuwa kilogramu.

   (a) g 1 000 (b) g 40 (c) g 3 500

5. Chupa yenye ujazo wa ml 1 000 ina maziwa yenye ujazo wa ml 750. Kiasi gani zaidi cha maziwa kinahitajika ili kujaza chupa hiyo?

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Vipimo vya Urefu

Uhusiano wa vipimo vya urefu

Uhusiano wa vipimo vya urefu unaanzia na kipimo cha milimeta (mm) ambacho ni kidogo na kuishia na kipimo kikubwa zaidi ambacho ni kilometa (km).

Chunguza jedwali lifuatalo linaloonesha uhusiano wa vipimo vya urefu.

milimeta (mm)	sentimeta (sm)	desimeta (dm)	meta (m)	dekameta (dam)	hektometa (hm)	kilometa (km)
1						
10	1					
100	10	1				
1 000	100	10	1			
10 000	1 000	100	10	1		
100 000	10 000	1 000	100	10	1	
1 000 000	100 000	10 000	1 000	100	10	1

Kwa kutumia jedwali la vipimo vya urefu, unaweza kubaini uhusiano wa kipimo kimoja na kingine.

Mfano

(a) m 1 = mm 1 000 (b) dm 1 = sm 10 (c) dam 1 = m 10

Kubadili vipimo vya urefu

Kubadili vipimo vikubwa vya urefu kuwa vidogo, tendo la kuzidisha hutumika. Kubadili vipimo vidogo kuwa vikubwa tendo kugawanya hutumika kwa kuzingatia uhusiano wa vipimo hivyo.

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Mfano wa 1

(a) Badili kilometa 13 kuwa meta.

Njia

km 1 = m 1 000

km 13 = ?

Hivyo, km 13 = $\frac{\text{m } 1\,000 \times \cancel{\text{km}}\ 13}{\cancel{\text{km}}\ 1}$

= m 13 000.

Kwa hiyo, kilometa 13 ni sawa na meta 13 000.

(b) Badili m 7 kuwa dm.

Njia

m 1 = dm 10

m 7 = ?

Hivyo, m 7 = $\frac{\text{dm } 10 \times \cancel{\text{m}}\ 7}{\cancel{\text{m}}\ 1}$

= dm 70.

Kwa hiyo, m 7 ni sawa na dm 70.

Mfano wa 2

(a) Badili sm 300 kuwa m.

Njia

m 1 = sm 100

? = sm 300

Hivyo, sm 300 = $\frac{\cancel{\text{sm}}\ 300 \times \text{m } 1}{\cancel{\text{sm}}\ 100}$

= m 3.

Kwa hiyo, sm 300 ni sawa na m 3.

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(b) Badili mm 500 kuwa sm.

Njia

Sm 1 = mm 10

? = mm 500

Hivyo, mm 500 $= \frac{\not{mm}\,500 \times sm\,1}{\not{mm}\,10}$

$= sm\ 50.$

Kwa hiyo, mm 500 ni sawa na sm 50.

(c) Badili meta 3 250 kuwa kilometa.

Njia

km 1 = m 1 000

? = m 3 250

Hivyo, m 3 250 $= \frac{\not{m}\,3\,250 \times km\,1}{\not{m}\,1\,000}$

$= km\ 3\frac{1}{4}.$

Kwa hiyo, meta 3 250 ni sawa na kilometa $3\frac{1}{4}$.

Zoezi la 2

Jibu maswali yafuatayo:

1. Badili kuwa meta.
(a) km 3 (b) hm 9 (c) dam 7 (d) km 4 (e) hm 3

2. Badili kuwa sentimeta.
(a) m 8 (b) dm 7 (c) dam 6 (d) m 4 (e) hm 5

3. Badili kuwa kilometa.
(a) m 7 000 (b) dm 12 000 (c) hm 9 000 (d) dam 40

4. Badili kuwa meta.
(a) mm 6 000 (b) dm 4 000 (c) sm 7 000 (d) dm 4 120
(e) dam 6 (f) hm 5

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5. Badili vipimo kwa kufuata maelekezo yaliyotolewa.

(a) mm 10 kuwa dm

(b) sm 85 kuwa dm na sm

(c) km $1\frac{1}{2}$ kuwa m

(d) hm $4\frac{1}{2}$ kuwa m

(e) dam $4\frac{1}{2}$ kuwa dm

(f) m 5 000 kuwa km.

Kujumlisha vipimo vya urefu

Vipimo vinavyofanana vinaweza kujumlishwa. Vipimo mchanganyiko hujumlishwa baada ya kuvibadili kwa kuzingatia uhusiano uliopo kati ya kipimo kimoja na kingine.

Mfano wa 1

(a) km 10 + km 3 = km 13

(b) km 8 hm 3 + km 6 hm 5 =

Njia

	km	hm
	8	3
+	6	5
	14	8

Mfano wa 2

(a) km 7 hm 5 + km 4 hm 8 =

Hatua:

1. hm 5 + hm 8 = hm 13 ni sawa na km 1 na hm 3. Andika 3 katika safu ya hm. Jumlisha km 1 katika safu ya km.

	km	hm
	7	5
+	4	8
		3

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2. Jumlisha, km 1 + km 7 + km 4 = km12.
Andika 12 kwenye safu ya km.

	km	hm
	7	5
+	4	8
	12	3

Kwa hiyo, jibu ni km 12 hm 3.

(b)

	km	hm	dam
	7	4	9
+	6	6	3

Njia

	km	hm	dam
	7	4	9
+	6	6	3
	14	1	2

Zoezi la 3

Jibu maswali yafuatayo:

1.

	sm	mm
	13	3
+	5	4

2.

	sm	mm
	3	4
+	1	8

3.

	sm	mm
	1	9
+	3	2

4.

	m	dm	mm
	3	6	7
+	7	5	9

5.

	m	dm	sm
	9	5	1
+	4	7	9

6.

	dm	sm	mm
	3	4	6
+	8	2	5

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7.

	m	dm	mm
	4	7	9
+	3	8	4

8.

	m	sm	mm
	4	25	4
+	6	80	8

9.

	km	m
	9	56
+	6	48

10.

	km	m	sm
	4	40	26
	3	22	68
+	5	71	23

11.

	dm	sm	mm
	61	3	5
	8	3	8
+	11	3	4

12.

	km	hm
	5	6
+	2	8

13.

	km	m	sm
	5	70	81
	7	47	40
+	2	860	60

14.

	dm	sm	mm
	13	4	6
	35	8	4
+	30	0	3

15.

	dm	sm	mm
	14	0	3
	40	8	6
+	12	3	1

16.

	m	sm	mm
	4	45	2
+	8	45	6

17.

	km	dam	sm
	7	40	4
	3	54	2
+	11	30	4

18.

	m	sm	mm
	6	81	4
	3	40	2
+	0	25	3

19.

	m	sm	mm
	1	65	3
	4	60	4
+	5	14	1

20.

	m	sm
	4	45
+	8	45

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Kutoa vipimo vya urefu

Tendo la kutoa linaweza kufanyika kwa vipimo vinavyofanana. Vipimo mchanganyiko vinaweza kupunguzwa au kutolewa baada ya kuvibadili kwa kuzingatia uhusiano uliopo kati ya kipimo kimoja na kingine.

Mfano wa 1

	m	sm
	4	45
–	2	20

Hatua:

1. Toa vipimo vya safu ya sentimeta: sm 45 – sm 20 = sm 25. Andika 25 katika safu ya sm.

	m	sm
	4	45
–	2	20
		25

2. Toa vipimo vya safu ya meta: m 4 – m 2 = m 2. Andika 2 katika safu ya m.

   Kwa hiyo, jibu ni m 2 sm 25.

	m	sm
	4	45
–	2	20
	2	25

Mfano wa 2

	km	m	sm
	10	160	55
–	4	580	76

Hatua:

1. sm 55 – sm 76, haiwezekani. Chukua m1 kutoka m 160 sawa na sm 100, ongeza na sm 55 unapata sm 155. Toa, sm155 – sm76 = sm 79. Andika 79 katika safu ya sm.

	km	m	sm
	10	160	55
–	4	580	76
			79

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2. Katika safu ya m zilibaki m 159.
Toa, m 159 – m 580 haiwezekani.
Chukua km 1 kutoka km 10 sawa na m 1000 kisha jumlisha na m 159; unapata m 1 159.
Hivyo, m 1 159 – m 580= m 579.
Andika 579 katika safu ya m.

	km	m	sm
	10	160	55
–	4	580	76
		579	79

3. Katika safu ya km zilibaki km 9.
Toa, km 9 – km 4 = km 5.
Andika 5 katika safu ya km.

	km	m	sm
	10	160	55
–	4	580	76
	5	579	79

Kwa hiyo, jibu ni km 5 m 579 sm 79.

Zoezi la 4

Jibu maswali yafuatayo:

1.

	km	m
	26	580
–	12	870

2.

	km	m	sm
	27	240	64
–	14	860	95

3.

	m	sm
	12	30
–	4	35

4.

	km	m	dm
	125	120	8
–	85	260	3

5.

	km	m	sm
	19	122	71
–	13	410	90

6.

	dm	sm
	10	5
–	3	7

7.

	dm	sm	mm
	9	4	5
–	3	7	6

8.

	sm	mm
	9	9
–	2	3

9.

	km	m
	9	400
–	5	700

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10.

	km	m
	9	500
–	4	700

11.

	km	m
	9	390
–	6	800

12.

	km	m
	105	200
–	5	105

13.

	dm	mm
	75	2
–	4	5

14.

	km	dam	sm
	17	6	6
–	10	3	5

15.

	m	sm
	8	4
–	1	6

Vipimo vya uzani

Vitu vyenye uzito (uzani) hupimwa kwa kutumia vipimo vya tani, kilogramu (kg), hektogramu (hg), dekagramu (dag), gramu (g), desigramu (dg), sentigramu (sg) na miligramu (mg).

Uhusiano wa vipimo vya uzani

miligramu (mg)	sentigramu (sg)	desigramu (dg)	gramu (g)	dekagramu (dag)	hektogramu (hg)	kilogramu (kg)
1						
10	1					
100	10	1				
1000	100	10	1			
10 000	1 000	100	10	1		
100 000	10 000	1 000	100	10	1	
1 000 000	100 000	10 000	1 000	100	10	1

tani 1 = kilogramu 1 000.

Kwa kutumia jedwali, uhusiano wa vipimo unaweza kubainishwa.

Mfano

(a) g 1 = mg 1 000 (b) sg 1 = mg 10

(c) g 1 = sg 100 (d) kg 1 = g 1 000

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Kubadili vipimo vya uzani

Kubadili vipimo vikubwa vya uzani kuwa vidogo, tendo la kuzidisha hutumika. Kubadili vipimo vidogo kuwa vikubwa, tendo la kugawanya hutumika kwa kuzingatia uhusiano wa vipimo.

Mfano wa 1

(a) Badili kilogramu 5 kuwa gramu:

Njia

kg 1 = g 1 000

kg 5 = ?

Hivyo, kg 5 = $\frac{\text{g } 1\,000 \times \cancel{\text{kg}}\ 5}{\cancel{\text{kg}}\ 1}$

= g 5 000.

Kwa hiyo, kilogramu 5 ni sawa na gramu 5 000.

(b) Badili tani $8\frac{1}{2}$ kuwa kilogramu.

Njia

tani 1 = kg 1 000

tani $8\frac{1}{2}$ = ?

Hivyo, tani 8 = $\frac{\text{kg } 1\,000 \times \cancel{\text{tani}}\ 8}{\cancel{\text{tani}}\ 1}$

= kg 8 000.

Pia, badili tani $\frac{1}{2}$ kuwa kg.

tani $\frac{1}{2}$ = $\frac{\text{kg } 1\,000 \times \cancel{\text{tani}}\ 0.5}{\cancel{\text{tani}}\ 1}$

= kg 500.

Jumlisha vipimo vilivyopatikana.

tani $8\frac{1}{2}$ = kg 8 000 + kg 500 = kg 8 500.

Kwa hiyo, tani $8\frac{1}{2}$ ni sawa na kilogramu 8 500.

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Mfano wa 2

(a) Badili g 6 000 kuwa kg

Njia

kg 1 = g 1 000

? = g 6 000

Hivyo, g 6 000 = $\frac{\not{g}\,6\,000 \times kg\,1}{\not{g}\,1\,000}$

= kg 6.

Kwa hiyo, g 6 000 = kg 6.

(b) Miligramu 600 000 ni sawa kilogramu ngapi?

Njia

kg 1 = mg 1 000 000

? = mg 600 000

mg 600000 = $\frac{kg\,1 \times \not{mg}\,600\,000}{\not{mg}\,1\,000\,000}$

= kg 0.6.

Kwa hiyo, miligramu 600 000 ni sawa na kilogramu 0.6.

Zoezi la 5

Jibu maswali yafuatayo:

1. Kuna tani ngapi katika kilogramu zifuatazo?
   (a) kg 1 200 (b) kg 40 000 (c) kg 6 500
2. Badili tani zifuatazo kuwa kg.
   (a) tani 6 (b) tani 15 (c) tani $4\frac{1}{2}$
3. Miligramu zifuatazo ni sawa na gramu ngapi?
   (a) mg 4 250 (b) mg 500 000 (c) mg 200 000

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4. Kuna kilogramu ngapi katika gramu zifuatazo?
(a) g 180 (b) g 3 500 (c) g 7 500

5. Gramu zifuatazo ni sawa na milligramu ngapi?
(a) g 6 (b) g 10 (c) g $1\frac{1}{2}$

Kujumlisha vipimo vya uzani

Katika kujumlisha vipimo vya uzani, anza na vipimo vya kulia kuelekea kushoto kwa kuzingatia uhusiano wa vipimo.

Mfano

(a)

	g	mg
	4	225
+	4	370

Hatua:

1. Jumlisha kwanza safu ya mg:
mg 225 + mg 370 = mg 595. Andika 595 katika safu ya mg.

	g	mg
	4	225
+	4	370
		595

2. Kisha jumlisha safu ya g:
g 4 + g 4 = g 8. Andika 8 katika safu ya g.

Kwa hiyo, jibu ni g 8 mg 595.

	g	mg
	4	225
+	4	370
	8	595

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(b)

	tani	kg
	4	450
+	3	350

Hatua:

1. Jumlisha kwanza safu ya kg:
   kg 450 + kg 350 = kg 800.
   Andika 800 katika safu ya kg.

	tani	kg
	4	450
+	3	350
		800

2. Kisha jumlisha safu ya tani:
   tani 4 + tani 3 = tani 7.
   Andika 7 katika safu ya tani.

	tani	kg
	4	450
+	3	350
	7	800

Kwa hiyo, jibu ni tani 7 kg 800.

(c)

	tani	kg
	10	470
+	17	475
	27	945

Zoezi la 6

Jibu maswali yafuatayo:

1.

	tani	kg
	6	750
+	5	250

2.

	g	mg
	6	523
+	9	874

3.

	tani	kg
	6	345
+	6	820

4.

	kg	dag
	4	75
+	8	25

5.

	g	mg
	2	175
+	3	945

6.

	hg	dg
	19	375
+	14	765

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7.

	tani	dag
	4	500
+	7	660

8.

	kg	g
	3	800
+	3	434

9.

	kg	dg
	3	460
+	1	630

10.

	g	mg
	6	200
+	3	450

11.

	g	sg
	112	1
+	36	27

12.

	kg	hg
	3	4
+	3	1

13.

	tani	sg	mg
	12	216	9
+	5	801	6

14.

	tani	hg	g
	50	90	10
	25	70	30
+	20	55	30

15.

	hg	g	sg
	40	80	30
	71	14	40
+	20	22	70

16.

	kg	g
	14	365
	9	475
+	3	300

Kutoa vipimo vya uzani

Katika kutoa vipimo vya uzani anza na vipimo vya kulia kuelekea kushoto kwa kuzingatia uhusiano wa vipimo.

Mfano wa 1

	tani	kg
	12	740
–	6	420

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Hatua:

1. Toa kwanza safu ya kg:
kg740 – kg 420 = kg 320.
Andika 320 katika safu ya kg.

	tani	kg
	12	740
–	6	420
		320

2. Toa pia safu ya tani:
tani 12 – tani 6 = tani 6. Andika 6 katika safu ya tani.

	tani	kg
	12	740
–	6	420
	6	320

Kwa hiyo, jibu ni tani 6 kg 320.

Mfano wa 2

	tani	kg	g
	6	200	550
–	2	300	750

Hatua:

1. Toa kwanza safu ya g: g 550 – g 750, haiwezekani. Chukua kg1 katika kg 200 kisha badili kuwa g 1 000.
Jumlisha, g 1 000 + g 550 = g 1 550.
Toa, g 1 550 – g 750 = g 800.
Andika 800 katika safu ya g.

	tani	kg	g
	6	200	550
–	2	300	750
			800

2. Katika safu ya kg zimebaki kg 199.
Hivyo, kg 199 – kg 300, haiwezekani.
Chukua tani 1 katika tani 6 kisha badili kuwa kg 1 000. Hivyo,
kg 1 000 + kg 199 = kg 1 199.
Kwa hiyo, kg 1 199 – kg 300 = kg 899.
Andika 899 katika safu ya kg.

	tani	kg	g
	6	200	550
–	2	300	750
		899	800

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3. Katika safu ya tani zimebaki tani 5.
Toa tani 5 – tani 2 = tani 3.
Andika tani 3 kwenye safu ya tani.

	tani	kg	g
	6	200	550
–	2	300	750
	3	899	800

Kwa hiyo, jibu ni tani 3 kg 899 g 800.

Zoezi la 7

Jibu maswali yafuatayo:

1.

	tani	kg
	6	220
–	4	114

2.

	tani	kg
	26	370
–	13	250

3.

	tani	kg
	15	620
–	13	220

4.

	kg	g
	14	190
–	8	650

5.

	kg	g
	14	239
–	12	910

6.

	tani	hg
	4	54
–	2	340

7.

	kg	dag
	20	600
–	6	560

8.

	g	mg
	17	910
–	12	440

9.

	kg	g
	16	860
–	13	900

10.

	tani	hg	g
	10	43	64
–		37	27

11.

	g	mg
	40	720
–	15	570

12.

	hg	g
	15	85
–	12	90

13.

	tani	g	sg
	70	40	60
–	15	12	38

14.

	tani	g	mg
	6	800	660
–	3	280	830

15.

	hg	g	sg
	4	31	12
–	1	81	04

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Vipimo vya ujazo

Kipimo cha msingi cha ujazo ni lita (l)
Lita (l) 1 = mililita (ml) 1 000

Kubadili vipimo vya ujazo

Kubadili vipimo vikubwa vya ujazo kuwa vidogo, tendo la kuzidisha hutumika. Pia, kubadili vipimo vidogo kuwa vikubwa tendo la kugawanya hutumika kwa kuzingatia uhusiano wa vipimo.

Mfano wa 1

(a) Kuna mililita ngapi katika lita 9?

Njia

l 1 = ml 1 000

l 9 = ?

Hivyo, l 9 = $\frac{\text{ml } 1\,000 \times \cancel{l}\,9}{\cancel{l}\,1}$

= ml 9 000.

Kwa hiyo, kuna mililita 9 000 katika lita 9.

(b) Je lita $6\frac{1}{2}$ ni sawa na ml ngapi?

Njia

l 1 = ml 1 000

l $6\frac{1}{2}$ = ?

Hivyo, l 6 = $\frac{\text{ml } 1\,000 \times \cancel{l}\,6}{\cancel{l}\,1}$

= ml 6 000.

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Pia, badili l $\frac{1}{2}$ kuwa ml.

l $\frac{1}{2}$ = $\frac{\text{ml } 1\,000 \times \not{l}\, 0.5}{\not{l}\, 1}$ = ml 500.

Jumlisha vipimo vilivyopatikana:

l $6\frac{1}{2}$ = ml 6 000 + ml 500

= ml 6 500.

Kwa hiyo, lita $6\frac{1}{2}$ ni sawa na ml 6 500.

Mfano wa 2

(a) Kuna lita ngapi katika mililita 18 000?

Njia

l 1 = ml 1 000

? = ml 18 000

Hivyo, ml 18 000 = $\frac{\not{ml}\, 18\,000 \times \text{l } 1}{\not{ml}\, 1\,000}$ = l 18

Kwa hiyo, kuna lita 18 katika mililita 18 000.

(b) Badili ml 8 500 kuwa l.

Njia

l 1 = ml 1 000

? = ml 8 000

Hivyo, ml 8 000 = $\frac{\not{ml}\, 8\,000 \times \text{l } 1}{\not{ml}\, 1\,000}$

= l 8.

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Pia badili ml 500 kuwa lita.

$$\text{ml } 500 = \frac{\cancel{\text{ml}}\ 500 \times l\ 1}{\cancel{\text{ml}}\ 1\ 000} = l\ \frac{1}{2}.$$

Jumlisha vipimo vilivyopatikana.

$$\text{ml } 8500 = l\ 8 + l\frac{1}{2} = l\ 8\frac{1}{2}.$$

Kwa hiyo, ml 8 500 = $l\ 8\frac{1}{2}$.

Zoezi la 8

Jibu maswali yafuatayo:

1. Kuna mililita ngapi katika lita zifuatazo?

(a) lita 9 (b) lita $4\frac{1}{2}$

(c) lita $3\frac{1}{4}$ (d) lita 5

2. Kuna lita ngapi katika vipimo vifuatavyo?

(a) ml 14 000 (b) ml 6 000

(c) ml 2 000 (d) ml 8 500

3. Salome alibeba ndoo yenye ujazo wa lita 20. Je, ujazo huo ni sawa na mililita ngapi?

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Kujumlisha vipimo vya ujazo

Mfano wa 1

	l	ml
	3	600
+	4	450

Hatua:

1. Jumlisha kwanza safu ya mililita:
   ml 600 + ml 450 = ml 1 050.
   Badili ml 1 050 kuwa l 1 ml 50.
   Andika 50 katika safu ya mililita.

	l	ml
	3	600
+	4	450
		50

2. Jumlisha safu ya lita:
   l 1 + l 3 + l 4 = l 8. Andika l 8 katika safu ya lita.

   Kwa hiyo, jibu ni l 8 ml 50.

	l	ml
	3	600
+	4	450
	8	50

Mfano wa 2

	l	ml
	6	550
+	3	160
	9	710

Zoezi la 9

Jibu maswali yafuatayo:

1.

	l	ml
	415	205
+	27	8

2.

	l	ml
	360	350
+	124	230

3.

	l	ml
	600	40
+	350	250

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4.

	l	ml
	475	75
+	126	520

5.

	l	ml
	78	426
+	55	542

6.

	l	ml
	14	760
+	14	138

7.

	l	ml
	4	750
	316	250
+	15	101

8.

	l	ml
	17	800
+	3	366

9.

	l	ml
	3	400
+	4	360

10.

	l	ml
	20	920
	14	112
+	13	126

Kutoa vipimo vya ujazo

Mfano wa 1

l 80 ml 370 – l 45 ml 160 =

Hatua:

1. Toa kwanza safu ya mililita:
   ml 370 – ml 160 = ml 210.
   Andika 210 katika safu ya mililita.

	l	ml
	80	370
–	45	160
		210

1. Toa pia safu ya lita:
   l 80 – l 45 = l 35.
   Andika 35 katika safu ya lita.

	l	ml
	80	370
–	45	160
	35	210

Kwa hiyo, jibu ni l 35 ml 210.

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Mfano wa 2

	l	ml
	15	350
–	10	370
	4	980

Zoezi la 10

Jibu maswali yafuatayo:

1.

	l	ml
	30	75
–	16	87

2.

	l	ml
	500	50
–	300	250

3.

	l	ml
	68	423
–	41	544

4.

	l	ml
	45	513
–	16	701

5.

	l	ml
	46	48
–	33	35

6.

	l	ml
	72	490
–	37	541

7.

	l	ml
	100	100
–	15	900

8.

	l	ml
	330	800
–	130	600

9.

	l	ml
	75	426
–	53	532

10.

	l	ml
	11	41
–	8	74

11.

	l	ml
	20	93
–	16	37

12.

	l	ml
	90	180
–	45	382

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13.

	l	ml
	31	510
–	16	600

14.

	l	ml
	48	17
–	33	35

15.

	l	ml
	62	281
–	37	541

16.

	l	ml
	100	700
–	15	900

17.

	l	ml
	330	600
–	130	800

18.

	l	ml
	75	378
–	53	532

19.

	l	ml
	25	61
–	8	75

20.

	l	ml
	66	89
–	52	48

Zoezi la 11

Jibu maswali yafuatayo:

1.

	dm	sm	mm
	6	25	6
+	3	12	2

2.

	tani	kg	g
	11	500	174
+	7	751	937

3.

	l	ml
	50	25
–	45	675

4.

	km	m	sm
	5	400	80
+	10	200	40

5.

	kg	g
	474	572
–	340	281

6.

	l	ml
	315	950
+	16	250

7. Pipa la maji lenye lita 45 lilianguka, na sehemu ya maji hayo yalimwagika. Ikiwa zilibaki lita 23, lita ngapi za maji zilimwagika?

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8. Mvuvi aliuza samaki tani 3 kg 680 mwezi Januari na tani 4 kg 250 mwezi Februari. Je, uzani wa Februari ulizidi ule wa Januari kwa kiasi gani?

9. Vipande vitatu vya mistari vyenye urefu wa sm 14, sm 9 na sm 21 vilichorwa kwa kuunganishwa. Kipande cha mstari kilichopatikana baada ya kuunganishwa kilikuwa na urefu gani?

10. Mzee Mapesa alikuwa na mapipa mawili ya mafuta ya taa. Pipa la kwanza lilijaa mafuta kiasi cha lita 216. Pipa la pili lilikuwa na mafuta $\frac{3}{4}$ ya pipa la kwanza. Je, pipa la pili lilikuwa na lita ngapi?

11. Muuza duka alinunua kg 76 000 za unga, kg 61 000 za mchele na kg 7 200 za chumvi kwa mwaka mzima. Je, jumla alinunua kilogramu ngapi?

12. Fundi seremala aliunganisha mbao mbili akapata ubao mmoja wenye urefu wa meta 10. Ikiwa ubao wa kwanza ulikuwa na urefu wa meta 3.5, ubao wa pili ulikuwa na urefu gani?

Jikumbushe

1. Uhusiano wa mita na sentimeta ni, m 1 = sm 100.
2. Uhusiano wa kilogramu na gramu ni, kg 1 = g 1 000.
3. Uhusiano wa lita 1 na mililita ni, l 1 = ml 1 000.
4. Katika kujumlisha na kutoa vipimo mchanganyiko zingatia uhusiano wa vipimo husika.

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Sura ya Kumi na Tatu

Fedha ya Tanzania

Ulipokuwa Darasa la Nne ulijifunza kujumlisha, kutoa na kuzidisha fedha ya Tanzania. Pia, ulijifunza jinsi ya kufumbua mafumbo yanayohusu manunuzi na mauzo. Katika sura hii, utajifunza kuandika fedha katika shilingi na senti, kujumlisha, kutoa, kuzidisha na kugawanya fedha hadi shilingi milioni moja. Vilevile, utaendelea kujifunza kufumbua mafumbo yanayohusu fedha.

Zoezi la 1: Marudio

Jibu maswali yafuatayo:

1. sh 11 500 + sh 80 150 =
2. sh 66 000 + sh 3 500 =
3. sh 52 670 + sh 17 380 =
4. sh 56 280 + sh 38 270
5. sh 78 850 + sh 5 850
6. sh 99 999 – sh 86 700 =
7. sh 462 × 10
8. sh 5 670 – sh 3 980
9. sh 44 450 – sh 3 750
10. sh 84 500 – sh 53 950
11. sh 560 × 12
12. sh 635 × 16 =
13. sh 960 × 36 =

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14. Juhudi alikuwa na shilingi 350 mfukoni mwake. Mwalimu wake alimpa zawadi ya shilingi 1 000 baada ya kufaulu mtihani wa Hisabati na pia mama yake alimpatia shilingi 1 700. Je, Juhudi alikuwa na jumla ya kiasi gani cha fedha?

15. Mwalimu mkuu alinunua kitabu kwa shilingi 6 500. Pia, alinunua daftari 10 kila moja kwa shilingi 250. Alimpatia muuzaji noti ya shilingi 10 000. Je, alirudishiwa shilingi ngapi?

16. Basi lina abiria 32. Iwapo nauli ya abiria mmoja ni shilingi 450, kiasi gani cha fedha kitakusanywa kutoka kwa abiria wote?

17. sh 1 390 + sh 575 + sh 6 750 =

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Fedha katika shilingi na senti

Fedha ya Tanzania ipo katika shilingi na senti. Thamani ya senti moja ni ndogo kuliko thamani ya shilingi moja. Fedha ya Tanzania pia ipo katika sarafu na noti zenye thamani mbalimbali.

Chunguza sarafu na noti zifuatazo kisha soma thamani ya kila moja.

(a) Sarafu za senti

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(b) Sarafu za shilingi

(c) Noti za shilingi

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Uhusiano uliopo kati ya shilingi na senti ni kuwa shilingi 1 ni sawa na senti 100. Unapoandika fedha katika shilingi na senti, anza kuandika neno shilingi, kisha thamani, halafu andika senti na thamani yake. Shilingi kwa kifupi huandikwa **sh** na senti huandikwa **st**. Thamani ya shilingi na senti hutenganishwa kwa nukta inapoandikwa kwa tarakimu.

Mifano wa 1

(a) Je, shilingi 1 ni sawa na senti 50 ngapi?

Njia

sh 1 = st 100.

st 50 ukiongeza tena nyingine st 50 unapata st 100.
Kwa hiyo, shilingi 1 ni sawa na senti 50 mbili.

(b) Andika shilingi 500 na senti 50 kwa kifupi.
Jibu: Kwa kifupi ni sh 500 st 50 au sh 500.50.

Mfano wa 2

(a) Andika sh 700.00 kwa maneno.
Jibu: Kwa maneno ni shilingi mia saba au shilingi mia saba bila senti.

(b) Andika shilingi 1 200 na senti 70 kwa kifupi.
Jibu: Kwa kifupi ni sh 1 200.70 au sh 1 200 st 70.

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Zoezi la 2

Jibu maswali yafuatayo:

1. Soma na andika fedha kwa maneno katika jedwali linalofuata. Kipengele (a) ni mfano.

	Fedha kwa kifupi	Fedha kwa maneno
(a)	sh 1 100.20	Shilingi elfu moja mia moja na senti ishirini
(b)	sh 5 800.35	
(c)	sh 75 400 st 10	
(d)	sh 230 000 st 70	
(e)	sh 1 000 000.00	
(f)	sh 632 st 37	
(g)	sh 48 350.05	
(h)	sh 80 495 st 95	
(i)	sh 1 750 st 50	
(j)	sh 3 600.00	

2. Soma na andika fedha kwa kifupi katika jedwali linalofuata. Kipengele (a) ni mfano.

	Fedha kwa maneno	Fedha kwa kifupi
(a)	Shilingi mia mbili na senti ishirini na tano	sh 200 st 25
(b)	Shilingi mia tatu	
(c)	Shilingi 2 250 na senti 50	
(d)	Shilingi laki moja arobaini na tano elfu na senti thelathini	
(e)	Shilingi 70 na senti 10	

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3. Soma na andika fedha kwa kifupi katika jedwali linalofuata. Kipengele (a) ni mfano.

	Fedha kwa maneno	**Fedha kwa kifupi**
(a)	Shilingi hamsini na tano elfu na senti themanini na tano	sh 55 000.85
(b)	Shilingi mia sita arobaini na senti tano	
(c)	Shilingi 1 na senti 50	
(d)	Shilingi laki tisa tisini na tisa elfu mia nane na senti tisini	
(e)	Shilingi hamsini na senti sitini	

4. Shilingi 5 ni sawa na senti 10 ngapi?

5. Senti 10 zikiwa 30 ni sawa na shilingi ngapi?

6. Mshahara wa Rozi ni shilingi 315 000 na senti 80. Andika mshahara huo kwa kifupi.

Kujumlisha fedha

Unapojumlisha fedha zinazohusisha shilingi na senti zingatia kuwa shilingi 1 ni sawa na senti 100.

Mfano wa 1

sh	st
625	45
+ 364	20

Hatua:

1. Jumlisha kwanza senti kama ifutavyo: st 45 + st 20 = st 65. Andika 65 katika nafasi ya senti.

sh	st
625	45
+ 364	20
	65

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2. Kisha jumlisha sh 625 + sh 364 = sh 989.
   Andika 989 katika nafasi ya shilingi.

sh	st
625	45
+ 364	20
989	65

Kwa hiyo, jibu ni sh 989 st 65.

Mfano wa 2

sh	st
4 596	65
+ 3 987	75

Hatua:

1. Jumlisha kwanza st 65 + st 75 = st 140. Badili st 140 kuwa sh 1 na st 40, kisha andika st 40 katika nafasi ya senti na jumlisha sh 1 katika shilingi.

sh	st
4 596	65
+ 3 987	75
	40

2. Fuatisha kujumlisha shilingi:
   sh 1 + sh 4 596 + sh 3 987 = sh 8 584.
   Andika sh 8 584 katika nafasi ya shilingi.

sh	st
4 596	65
+ 3 987	75
8 584	40

Kwa hiyo, jibu ni sh 8 584 st 40.

Mfano wa 3

sh	st
105 001	80
+ 794 999	45
900 001	25

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Zoezi la 3

Jibu maswali yafuatayo:

1.

	sh	st
	1 060	05
+	2 175	15

2.

	sh	st
	650	45
+	679	40

3.

	sh	st
	5 075	05
+	3 350	50

4.

	sh	st
	3 009	65
+	4 087	55

5.

	sh	st
	5 707	35
	2 983	90
+	1 225	30

6.

	sh	st
	714 370	80
+	3 056	35

7.

	sh	st
	385 534	05
+	453 057	45

8.

	sh	st
	433 270	55
+	433 865	45

9.

	sh	st
	454 265	40
+	287 939	95

10.

	sh	st
	356 005	45
+	130 436	95

11. sh 863 435.10 + sh 28 375.65 =

12. sh 645 489.15 + sh 351 432.45 =

13. sh 432 456.10 + sh 463 367.65 =

14.

	sh	st
	456 354	50
+	130 218	95

15. sh 625 445.50 + sh 357 223.85 =

16. sh 423 293.45 + sh 549 315.25 =

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17.

	sh	st
	135 436	95
+	749 115	85

18.

	sh 193 432.45
	sh 367 563.65
+	sh 432 210.15

19. sh 14 955.50 + sh 4 955.55 =

20. sh 181.65 + sh 6 564.95 + sh 1 192.25 =

Kutoa fedha

Mfano wa 1

	sh	st
	420 561	65
–	110 340	40

Hatua:

1. Toa kwanza st 65 – st 40 = st 25.
   Andika st 25 katika nafasi ya senti.

	sh	st
	420 561	65
–	110 340	40
		25

2. Fuatisha kutoa shilingi:
   sh 420 561 – sh 110 340 = sh 310 221.
   Andika sh 310 221 katika nafasi ya shilingi.

	sh	st
	420 561	65
–	110 340	40
	310 221	25

Kwa hiyo, jibu ni sh 310 221 st 25.

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Mfano wa 2

sh	st
964 868	25
– 599 853	75

Hatua:

1. Toa kwanza senti: st 25 – st 75 haiwezekani. Chukua kutoka katika shilingi kisha badili sh 1 kuwa senti. sh 1 = st 100. Jumlisha st 100 + st 25 = st 125. Toa, st 125 – st 75 = st 50. Andika 50 katika nafasi ya senti.

sh	st
964 868	25
– 599 853	75
	50

2. Zimebaki sh 964 867, toa sh 964 867 – sh 599 853 = sh 365 014. Andika sh 365 014 katika nafasi ya shilingi.

sh	st
964 868	25
– 599 853	75
365 014	50

Kwa hiyo, jibu ni sh 365 014 na st 50.

Mfano wa 3

sh	st
953 964	45
– 599 868	65
354 095	80

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Zoezi la 4

Jibu maswali yafuatayo:

1.

	sh	st
	367 662	10
–	153 221	10

2.

	sh	st
	444 330	30
–	367 220	10

3.

	sh	st
	21 201	10
–	11 102	60

4.

	sh	st
	445 540	35
–	53 102	75

5.

	sh	st
	268 654	14
–	18 129	14

6.

sh 571 171.00
– sh 215 101.50

7.

	sh	st
	511	20
–	270	05

8.

	sh	st
	770 621	50
–	330 423	30

9.

	sh	st
	67 501	70
–	35 322	35

10.

	sh	st
	3 121	85
–	1 111	35

11.

	sh	st
	612 365	35
–	81 155	25

12.

	sh	st
	410 220	55
–	301 101	35

13.

	sh	st
	4 505	80
–	2 321	25

14.

	sh	st
	844 250	50
–	451 120	50

15.

	sh	st
	568 660	45
–	34 330	15

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16.

	sh	st
	611 180	50
–	211 070	70

17.

	sh	st
	212 157	60
–	141 220	80

18.

	sh	st
	774 450	00
–	274 110	00

19.

	sh 890 527.85
–	sh 30 210.80

20.

	sh	st
	1 000 000	00
–	850 000	20

Kuzidisha fedha

Mfano wa 1

	sh	st
	50	5
×		6

Hatua:

1. Anza kuzidisha senti 5 kwa 6:
   st 5 × 6 = st 30. Andika st 30 katika nafasi ya senti.

	sh	st
	50	5
×		6
		30

2. Zidisha shilingi 50 kwa 6:
   sh 50 × 6 = sh 300. Andika sh 300 katika nafasi ya shilingi.

	sh	st
	50	5
×		6
	300	30

Kwa hiyo, jibu ni sh 300 st 30 au sh 300.30.

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Mfano wa 2

sh	st
250	75
×	10

Hatua:

1. Zidisha st 75 kwa 10:

   st 75 × 10 = st 750. Badili st 750 kuwa sh 7 na st 50. Andika 50 katika nafasi ya senti na jumlisha sh 7 katika shilingi baada ya kuzidisha shilingi.

sh	st
250	75
×	10
	50

2. Zidisha sh 250 kwa 10:
   sh 250 × 10 = sh 2 500.
   Chukua sh 7 + sh 2 500 = sh 2 507.
   Andika sh 2 507 katika nafasi ya shilingi.

sh	st
250	75
×	10
2 507	50

Kwa hiyo, jibu ni sh 2 507 st 50 au sh 2 507.50.

Mfano wa 3

sh	st
5 230	90
×	29
151 696	10

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Zoezi la 5

Jibu maswali yafuatayo:

1.

	sh	st
	500	20
×		4

2.

	sh	st
	3 115	30
×		5

3.

	sh	st
	601	30
×		30

4.

	sh	st
	10 000	00
×		28

5.

	sh	st
	4 010	90
×		2

6.

	sh	st
	65	40
×		8

7.

	sh	st
	21 720	60
×		20

8.

	sh	st
	700	55
×		9

9.

	sh	st
	180	15
×		15

10.

	sh	st
	35 320	70
×		12

Kugawanya fedha

Unapogawanya fedha anzia upande wa shilingi kuelekea upande wa senti.

Mfano wa 1

	sh	st
5)	10	50

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Hatua:

1. Kwanza gawanya, sh 10 ÷ 5 = sh 2.
   Andika sh 2 katika nafasi ya shilingi.

	sh	st
5)	10	50
	2	

2. Kisha gawanya, st 50 ÷ 5 = st 10.
   Andika st 10 katika nafasi ya senti.

	sh	st
5)	10	50
	2	10

Kwa hiyo, jibu ni sh 2 st 10.

Mfano wa 2

	sh	st
45)	205 312	50

Hatua:

1. sh 205 312 ÷ 45 = sh 4 562 baki sh 22. Andika 4 562 katika sehemu ya shilingi, kisha badili sh 22 kuwa st 2 200. Jumlisha, st 2 200 + st 50 = st 2 250.

	sh	st
45)	205 312	50
	4 562	

2. Gawanya, st 2 250 ÷ 45 = st 50.
   Andika 50 katika nafasi ya senti.

	sh	st
45)	205 312	50
	4 562	50

Kwa hiyo, jibu ni sh 4 562 st 50.

Mfano wa 3

	sh	st
9)	19 000	80
	2 111	20

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Zoezi la 6

Jibu maswali yafuatayo:

1. sh st
15)46 740 60

2. sh st
3)45 363 00

3. sh st
12)24 289 20

4. sh st
15)45 442 50

5. sh st
8)3 200 40

6. sh st
7)91 000 70

7. sh st
5)136 005 40

8. sh st
13)391 560 00

9. sh st
4)465 600 60

10. sh st
10)364 500 00

11. sh 645 000.00 ÷ 8 =

12. sh st
116)8 526 00

13. sh st
24)100 000 80

14. sh st
12)1 740 60

15. sh st
24)133 248 00

16. sh st
16)144 962 40

17. sh st
25)75 510 00

18. sh st
12)133 248 60

19. sh st
25)1 000 000 00

20. sh 111.20 ÷ 20 =

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Mafumbo ya mauzo na manunuzi

Mfano wa 1

Jozi moja ya viatu inauzwa kwa shilingi 23 500.50. Je, jozi 11 za aina hiyo ya viatu zitauzwa kwa shilingi ngapi?

Njia

Jozi 1 inauzwa sh 23 500.50.

Jozi 11 zitauzwa sh 23 500.50 × 11 = sh 258 505.50.

Kwa hiyo, jozi 11 za viatu zitauzwa kwa sh 258 505.50.

Mfano wa 2

Joseph alikuwa na shilingi 350 000. Alitumia shilingi 127 500. Alibakiwa na shilingi ngapi?

Njia

Joseph alikuwa na sh 350 000.

Alitumia sh 127 500.

Baki sh 350 000 – sh 127 500 = sh 222 500.

Kwa hiyo, Joseph alibakiwa na shilingi 222 500.

Mfano wa 3

Bahati alinunua shuka 3 @ shilingi 5 000, mashati 2 @ shilingi 3 000, sahani 4 @ shilingi 1 000 na bakuli 5 @ shilingi 500.

Alilipa jumla ya shilingi ngapi?

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Njia

Alama @ inamaanisha kila moja.

Bidhaa	sh	st
1. Shuka 3 @ sh 5 000	15 000	00
2. Mashati 2 @ sh 3 000	6 000	00
3. Sahani 4 @ sh 1 000	4 000	00
4. Bakuli 5 @ sh 500	2 500	00
Jumla	**27 500**	**00**

Kwa hiyo, alilipa jumla ya shilingi 27 500.00.

Zoezi la 7

Jibu maswali yafuatayo:

1. Kalista alinunua vitu vifuatavyo: Viatu jozi 3@ shilingi 13 500, kanga doti 2 @ 9 000, betri za simu 2 @ shilingi 10 000 na saa 4 @ shilingi 15 000. Je, alilipa jumla ya shilingi ngapi?
2. Mfanyabiashara aliuza maembe 285 na kupata jumla ya shilingi 119 913 na senti 75. Je, aliuza kila embe kwa bei gani?
3. Wanachama 72 waligawana sawa shilingi 174 499 na senti 20. Je, kila mwanachama alipata shilingi ngapi?
4. Fundi alinunua runinga kwa shilingi 420 000. Baadaye akaiuza kwa shilingi 580 000. Alipata kiasi gani cha fedha zaidi ya bei aliyonunulia?
5. Mwanafunzi alinunua vitu vifuatavyo: Madaftari 15 @ shilingi 600, Kalamu 8 @ shilingi 500, bahasha 5 @ shilingi 200 na vifutio 3 @ shilingi 200. Je alilipa fedha kiasi gani?

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6. Maringo alikuwa na shilingi 775 000 akatumia shilingi 131 650. Alibakiwa na shilingi ngapi?
7. Mkulima alipata sh 101 755 st 50 kwa kuuza mpunga na sh 207 800 st 50 kwa kuuza mahindi. Kwa mauzo hayo mawili alipata jumla ya fedha kiasi gani?
8. Mtu mmoja alikuwa na deni la shilingi 100 000. Alifanikiwa kulipa shilingi 80 750.60. Alibakiza deni kiasi gani?
9. Juma huweka shilingi 35 000 katika benki kila mwezi. Ataweka kiasi gani kwa mwaka mmoja?
10. Neema alikuwa na shilingi 335 500. Aliwagawia watoto wake 11 kiasi sawa cha fedha kwa ajili ya mahitaji ya shule. Je, kila mmoja alipata shilingi ngapi?
11. Mishahara ya wafanyakazi watatu wa shule moja ya msingi kwa mwezi ni kama ifuatavyo: Mfanyakazi wa kwanza hupata sh 296 364.40, wa pili hupata sh 350 220.35, na watatu hupata sh 349 416.90. Tafuta jumla ya mishahara yao kwa mwezi.
12. Makabati matatu yalinunuliwa kwa gharama zifuatazo: Kabati la kwanza lilinunuliwa kwa sh 295 000.50, la pili kwa sh 240 000.35 na la tatu kwa sh 360 000.30. Je, jumla yalinunuliwa kwa kiasi cha shilingi ngapi?

Zoezi la 8

Jibu maswali yafuatayo:

1. st 90 + st 45 =
2. sh 14 955.60 – sh 12 950.05 =
3. sh 70 300 st 40 + sh 113 200 st 25 =

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4.

	sh	st
	417	55
×		7

5.

	sh	st
	4 500	80
–	180	45

6.

	sh	st
	100	10
–	90	20

7.

	sh	st
	200 500	55
–	500	60

8.

	sh	st
	2 040	05
×		10

9.

	sh	st
8)	496	00

10.

	sh	st
25)	55 575	50

11.

	sh	st
	475	30
×		18

12.

	sh	st
50)	8 400	00

13. Andika kwa maneno shilingi na senti zifuatazo:

(a) sh 4 700 st 50
(b) sh 260. 25
(c) sh 17 840. 65
(d) sh 935 st 40
(e) sh 812 530 st 05

14. Andika kwa tarakimu shilingi na senti zifuatazo:

(a) Shilingi mia nane themanini na tano na senti ishirini
(b) Shilingi laki moja na senti tisini na tano
(c) Shilingi mia tatu na kumi elfu mia moja hamsini na senti sitini
(d) Shilingi elfu kumi na hamsini
(e) Shilingi mia tano na senti kumi na tano

15. Senti ishirini zikiwa 50 thamani yake ni sawa na shilingi ngapi?

16. Ukibadilisha shilingi 10 kuwa senti utapata senti hamsini ngapi?

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17. Mwanahamisi alipata shilingi laki tatu kumi na saba elfu na senti sabini na tano kwa kuuza pamba, na shilingi laki tatu ishirini elfu na senti ishirini na tano kwa kuuza samaki. Jumla alipata fedha kiasi gani?

18. Mfanyabiashara alikuwa na deni la sh 178 500 st 35 katika benki ya biashara. Iwapo alilipa sh 54 900 st 20, alibakiza deni kiasi gani?

19. Wanachama 24 waligawana sawa shilingi 193 200. Je, kila mwanachama alipata kiasi gani cha fedha?

20. Doti moja ya kanga iliuzwa kwa sh 12 500. Iwapo ziliuzwa doti 44 za kanga kwa bei hiyo kila moja, je, zilipatikana shilingi ngapi?

Jikumbushe

1. Kujumlisha, kutoa na kuzidisha fedha, anza na senti kisha shilingi.
2. Unapogawanya fedha, anza na shilingi kisha senti.
3. Katika manunuzi na mauzo, alama @ inamaanisha kila moja.
4. Fedha ya Tanzania ipo katika sarafu na noti zenye thamani mbalimbali.
5. Unapotenga shilingi na senti katika tarakimu, senti huandikwa kwa tarakimu mbili.

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Sura ya Kumi na Nne

Jiometri

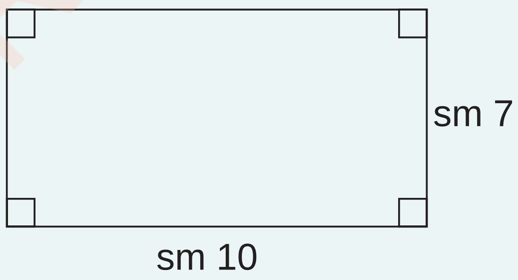
Ulipokuwa darasa la nne ulijifunza kuchora mstari, kipande cha mstari na mwale. Pia, ulijifunza kutafuta mzingo wa mstatili, mraba na pembetatu. Katika sura hii, utajifunza aina za pembe, kuchora pembe kwa kukadiria, kuchora mistari pacha na kubaini aina za pembetatu na sifa zake. Pia, utajifunza namna ya kutafuta eneo la mstatili, mraba na pembetatu na kufumbua mafumbo.

Zoezi la 1: Marudio

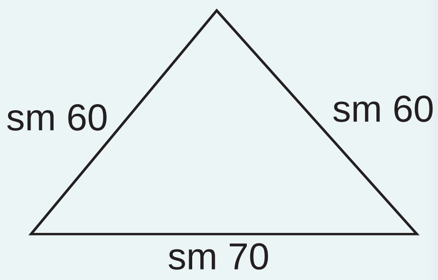
Jibu maswali yafuatayo:

1. Chora mwale AB na mwale BA.
2. Tafuta mzingo wa mstatili wenye urefu wa sm 12 na upana wa sm 8.
3. Tafuta mzingo wa umbo la mraba wenye upande wa sm 5.
4. Kuna tofauti gani kati ya umbo la mraba na umbo la pembetatu?
5. Chora kipande cha mstari XY.
6. Tafuta mzingo wa maumbo yafuatayo:

(a)



(b)



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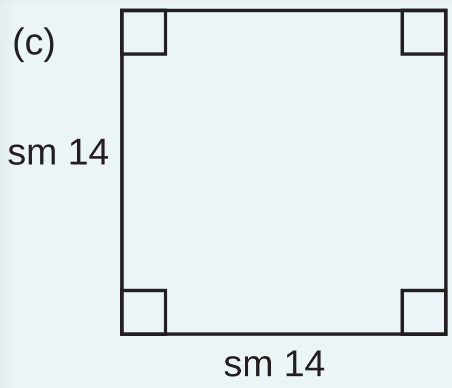
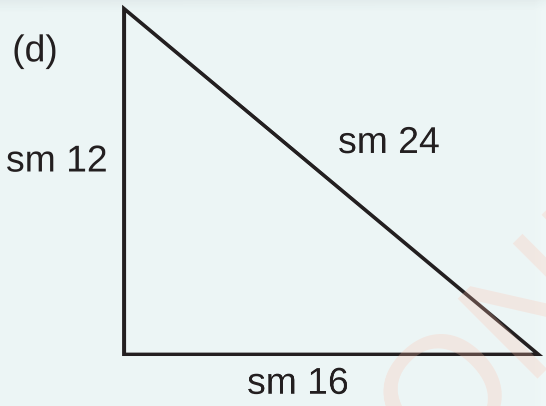
(c)



(d)



7. Tafuta mzingo wa mstatili wenye urefu wa sm 5 na upana wa sm 3.

8. Mzingo wa mraba ni sm 40, nini urefu wa upande mmoja?

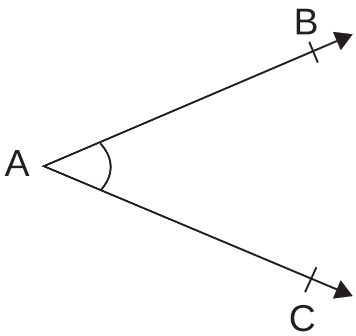
Pembe

Miale miwili inapokutana huunda pembe. Fuatilia mwale AB na mwale AC katika michoro ifuatayo:

Mwale **AB**

Mwale **AC**

Mwale AB na mwale AC ikikutana inaunda pembe kama inavyoonekana katika mchoro ufuatao.



Jina la pembe iliyoundwa ni pembe *BAC* na jina lingine la pembe hiyo ni pembe *CAB*.

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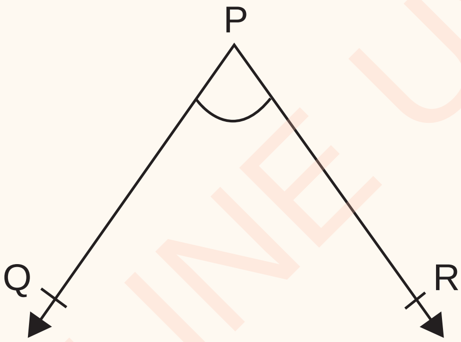
Pembe BAC inaweza kuandikwa pia kama $\angle BAC$ au $B\hat{A}C$. Alama "$\angle$" au "^" hutumika badala ya neno "pembe". Peo ya pembe hii ni A. Peo ni nukta ambapo miale miwili inakutana. Unapoandika au kusoma jina la pembe, herufi ya peo huwa katikati na uelekeo wa pembe huweza kuwa upande wowote.

Kubaini pembe

Mfano wa 1

Andika jina la pembe na peo inayopatikana katika mchoro ufuatao kwa namna tatu.



Pembe inaandikwa kwa namna tatu tofauti kama ifuatavyo:

1. Pembe QPR au pembe RPQ
2. $Q\hat{P}R$ au $R\hat{P}Q$
3. $\angle QPR$ au $\angle RPQ$

Peo ya pembe QPR ni P.

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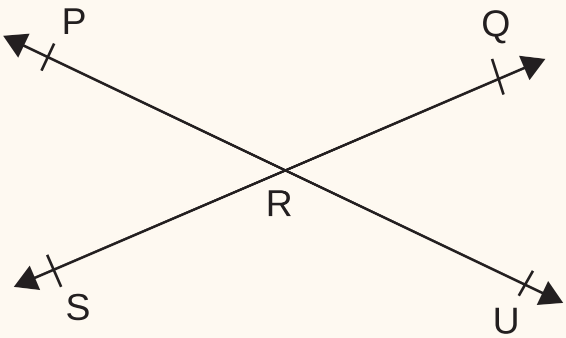
Mfano wa 2

Andika majina ya pembe zinazopatikana katika mchoro ufuatao:



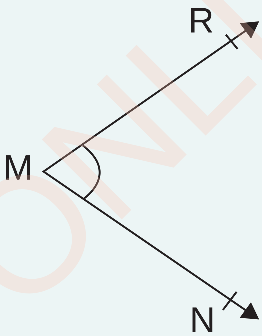
Pembe zinazopatikana ni; $\angle PRS$ au $\angle SRP$, $\angle SRU$ au $\angle URS$, $\angle QRU$ au $\angle URQ$ na $\angle PRQ$ au $\angle QRP$.

Zoezi la 2

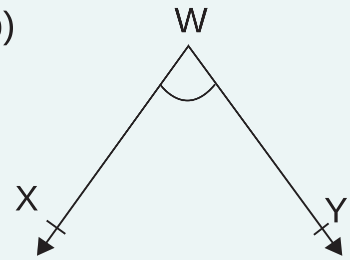
Jibu maswali yafuatayo:

1. Andika majina ya kila pembe katika michoro ifuatayo:

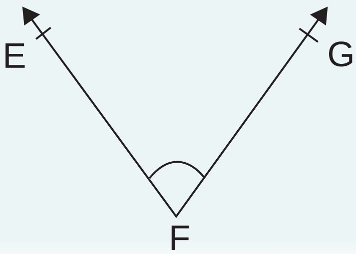
(a)



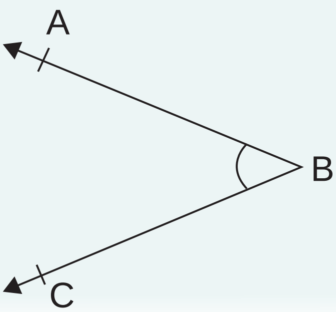
(b)



(c)



(d)



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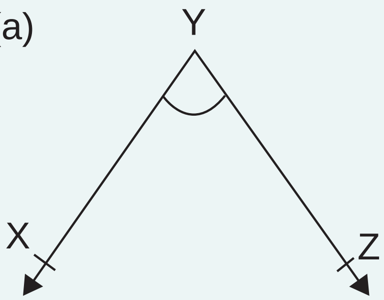
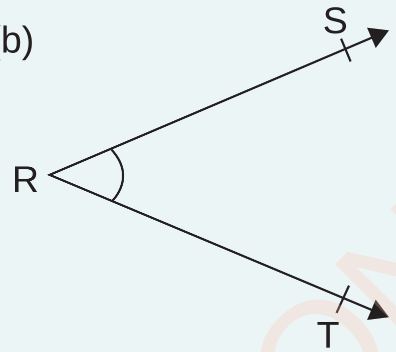
2. Taja peo ya kila pembe katika michoro ifuatayo:

(a)

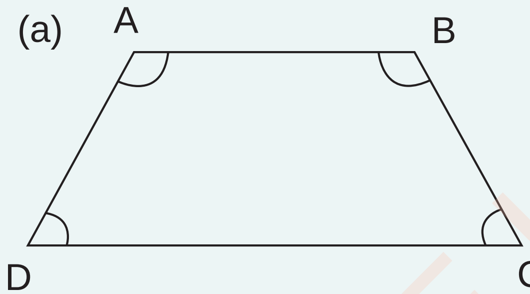


(b)

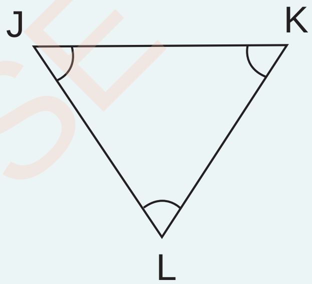


3. Andika pembe zote za maumbo yafuatayo:

(a)



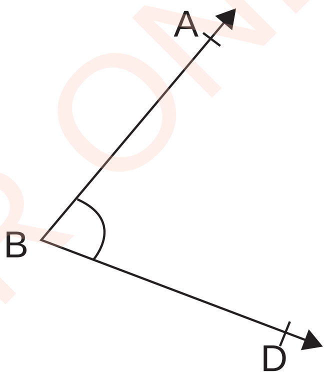
(b)



4. Taja idadi ya pembe katika umbo la:
(a) pembetatu (b) mraba

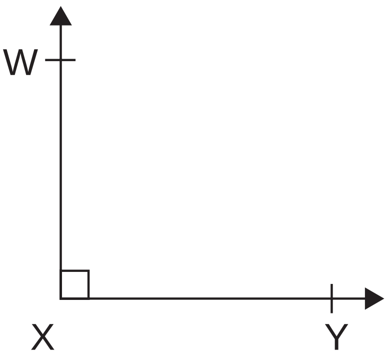
Aina za pembe

1.



Hii ni pembekali *ABD* au *DBA*. Pembekali ni ndogo kuliko pembemraba.

2.



Hii ni pembemraba *WXY* au *YXW*. Pembemraba ni ndogo kuliko pembebutu lakini ni kubwa kuliko pembekali.

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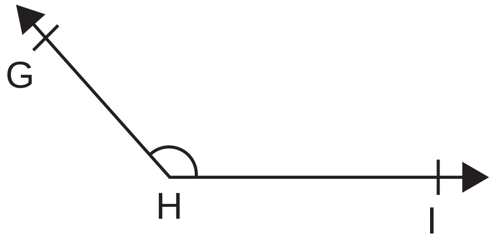
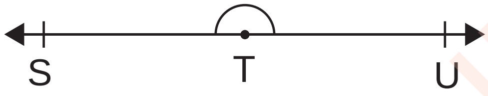
3.



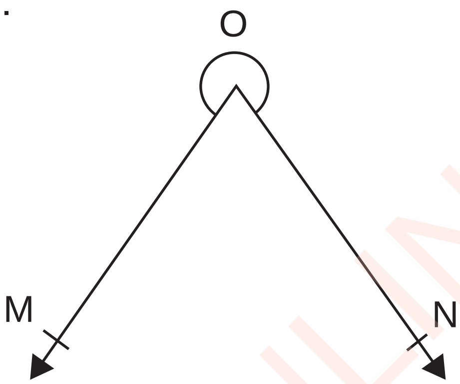
Pembe *GHI* au *IHG* ni pembebutu. Pembebutu ni ndogo kuliko pembenyoofu lakini ni kubwa kuliko pembemraba.

4.



Pembe *STU* au *UTS* ni pembenyoofu. Pembenyoofu ni ndogo kuliko pembekuu lakini ni kubwa kuliko pembebutu.

5.



Pembe *MON* au *NOM ni* pembekuu. Pembekuu ni ndogo kuliko pembeduara lakini ni kubwa kuliko pembenyoofu.

6.

Hii ni pembeduara. Pembeduara ni kubwa kuliko pembe zote.

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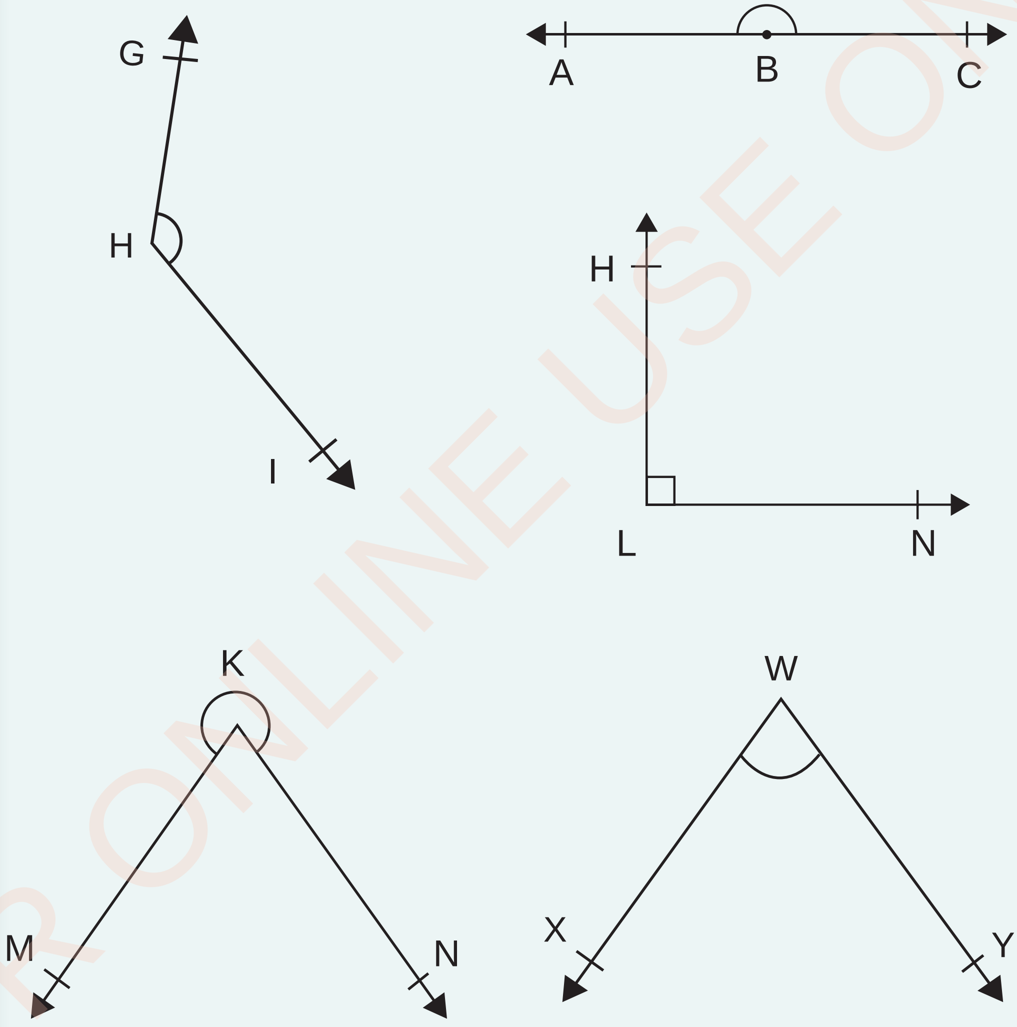
Zoezi la 3

Jibu maswali yafuatayo:

1. Chunguza pembe zifuatazo kisha jibu maswali yanayofuata.



(a) Ipi ni pembekali?

(b) Ipi ni pembemraba?

(c) Ipi ni pembebutu?

(d) Ipi ni pembenyoofu?

(e) Ipi ni pembekuu?

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2. Katika umbo lifuatalo, andika majina ya pembemraba zote.

3. Andika “KWELI” au “SI KWELI” kwa kila sentensi zifuatazo:

(a) Pembekali ni ndogo kuliko pembemraba.

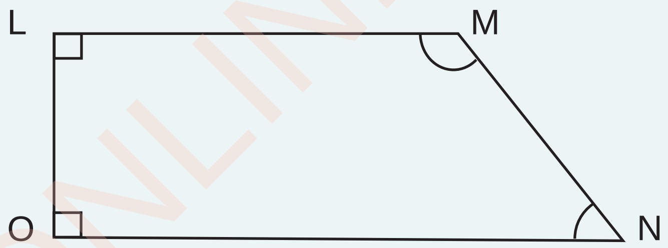
(b) Pembebutu ni ndogo kuliko pembekali.

(c) Kila pembenyoofu ina pembemraba mbili.

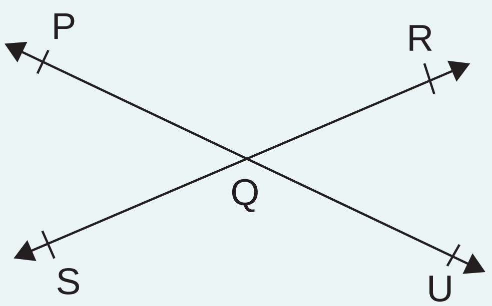
(d) Pembekuu ni ndogo kuliko pembebutu.

(e) Pembenyoofu ni ndogo kuliko pembekuu.

4. Andika majina ya pembemraba zinazopatikana katika umbo lifuatalo:



5. Andika majina na aina za pembe zinazopatikana katika mchoro ufuatao:



6. Taja maumbo ambayo pembe zake zote ni pembemraba.

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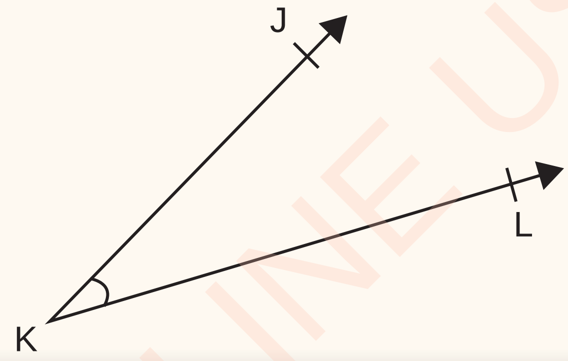
Kuchora pembe kwa kukadiria

Mfano wa 1

Chora pembekali *JKL.*

Hatua:

1. Chora mwale KL .
2. Chora mwale *KJ* kuanzia kwenye *K* kuunda pembekali kwa kukadiria.
3. Unapata pembe *JKL* yenye peo *K*, kama inavyoonekana kwenye mchoro unaofuata:



Mfano wa 2

Chora pembemraba *ABC*.

Hatua:

1. Chora mwale wa ulalo *BC*.
2. Chora mwale wa wima kuanzia kwenye *B* na uite *BA* kuunda pembemraba *ABC* .
3. Weka alama ya mraba □ mahali inapokutana miale. Unapata pembemraba *ABC* yenye peo *B* kama inavyoonekana katika mchoro.

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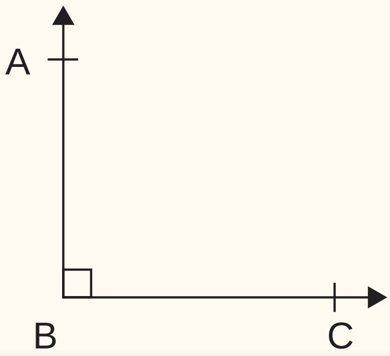


Zoezi la 4

Jibu maswali yafuatayo:

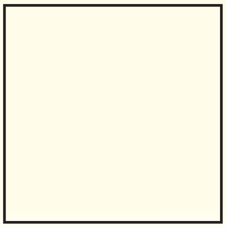
1. Chora pembe mbili ambapo pembe *ABC* ni ndogo kuliko pembe *DEF*.
2. Chora pembemraba *LMN.*
3. Chora pembebutu *WXY.*
4. Chora pembenyoofu *ABC*.
5. Chora pembekali *DEF*.

Mistari pacha

Shughuli ya 1: Kubaini idadi ya mistari pacha katika umbo la mraba

Hatua:

1. Chukua karatasi yenye umbo la mraba.



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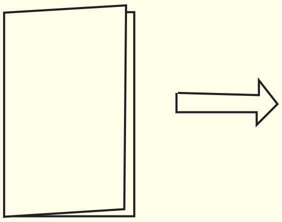
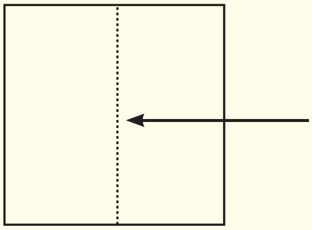
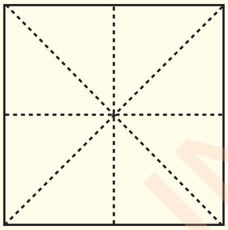
2. Kunja karatasi hiyo katika sehemu mbili zilizosawa.



3. Kunjua karatasi, utaona kuna mkunjo (mstari) katikati.



4. Endelea kukunja pande zilizobaki, utapata mistari pacha kama inavyoonekana katika mchoro ufuatao:

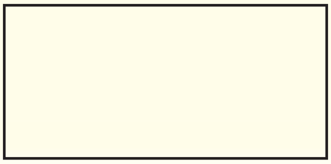


Kwa hiyo, umbo la mraba lina mistari pacha minne.

Shughuli ya 2: Kubaini idadi ya mistari pacha katika umbo la mstatili

Hatua:

1. Chukua karatasi yenye umbo la mstatili kama inavyoonekana katika mchoro ufuatao:



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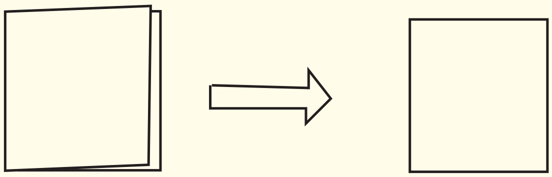
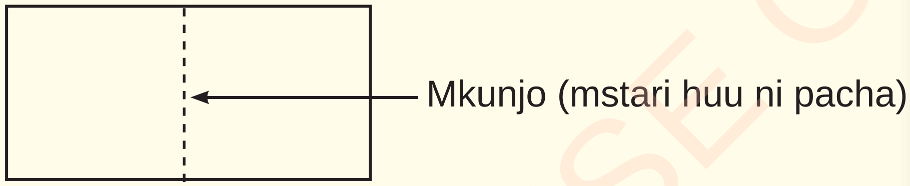
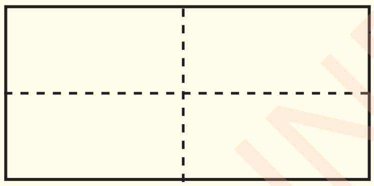
2. Kunja karatasi kwa urefu kupata sehemu mbili zilizosawa, kisha kipande kimoja kilale sawa juu ya kingine kama inavyoonekana katika mchoro ufuatao:



3. Kunjua karatasi, utaona mkunjo (mstari) katikati.



4. Kunja karatasi hiyo tena upande uliobaki utapata mistari pacha kama inavyoonekana katika mchoro ufuatao:



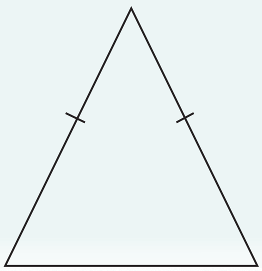
Kwa hiyo, umbo la mstatili lina mistari pacha miwili.

Zoezi la 5

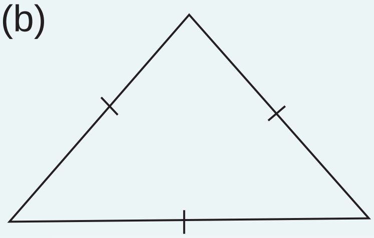
Jibu maswali yanayofuata:

1. Tafuta idadi ya mistari pacha katika kila umbo.

(a)



(b)



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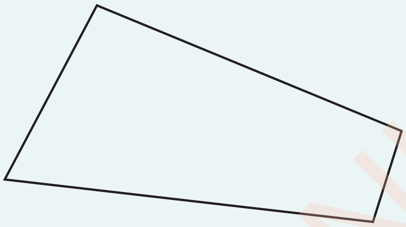
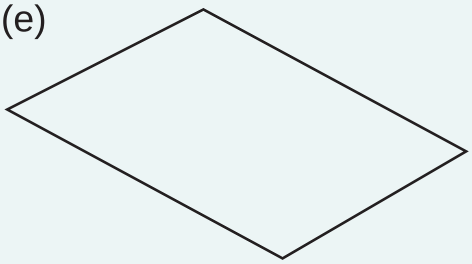
(c)

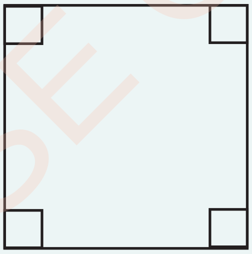
(d)



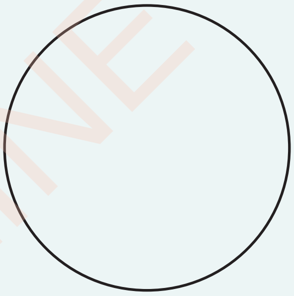
(e)



(f)

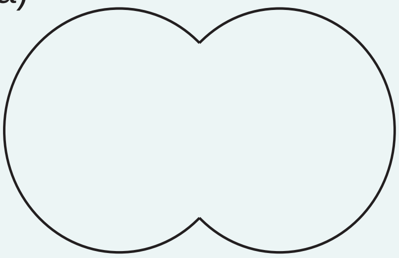


(g)



2. Maumbo yanayofuata yana mistari pacha mingapi kwa kukunja?

(a)



(b)

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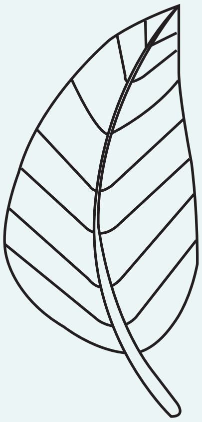
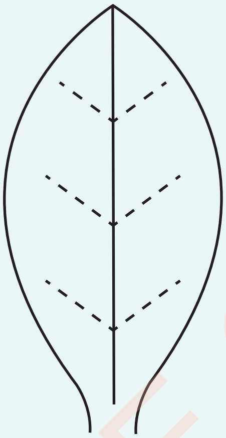
3. Tafuta idadi ya mistari pacha katika michoro ifuatayo:

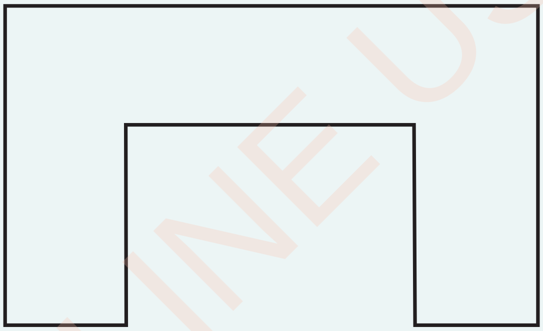
(a)



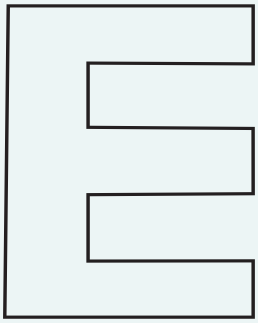
(b)



4. Umbo lifuatalo lina mistari pacha mingapi?



5. Umbo lifuatalo lina mistari pacha mingapi?



6. Namba 8 ina mistari pacha mingapi? Ionyeshe kwa kuchora.

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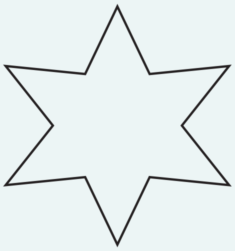
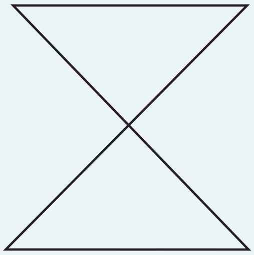
7. Nakili maumbo yafuatayo na chora mistari pacha yote ya kila umbo.

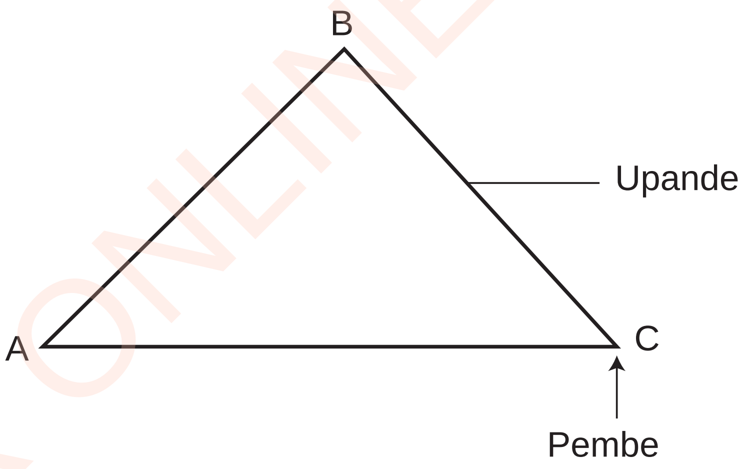
(a) 

(b) 

(c)

Pembetatu

Pembetatu ni umbo lenye pembe tatu na pande tatu. Mfano, umbo lifuatalo ni pembetatu.



Aina za pembetatu

Kuna aina nne za pembetatu ambazo ni :

(a) Pembetatu mraba
(b) Pembetatu pacha
(c) Pembetatu sawa
(d) Pembetatu guni

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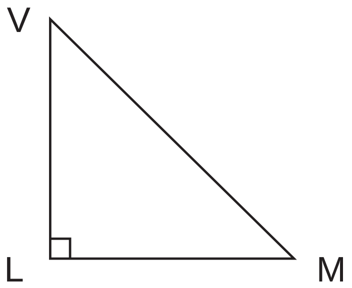
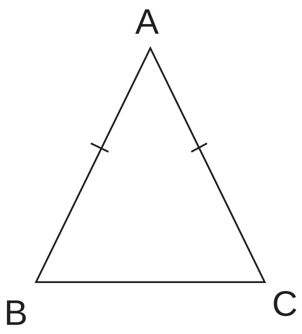
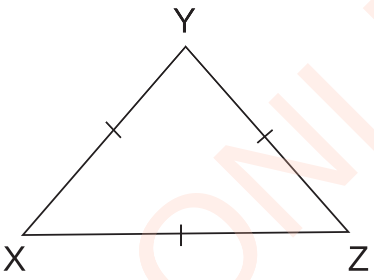
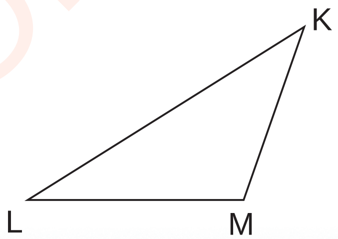
Aina za pembetatu na sifa zake:

Umbo	Jina	Sifa
	Pembetatu mraba	(a) Ina pembe tatu (b) Ina pembemraba moja (c) Ina pembekali mbili (d) Ina pande tatu
	Pembetatu pacha	(a) Ina pembe tatu (b) Ina pande mbili zinazolingana, upande AB = upande AC (c) Ina mstari pacha mmoja (d) Ina pembe mbili zinazolingana $\angle ABC = \angle ACB$
	Pembetatu sawa	(a) Ina pembe tatu zinazolingana $\angle YXZ = \angle XZY = \angle ZYX$ (b) Ina pande tatu zinazolingana $\overline{XY} = \overline{YZ} = \overline{ZX}$ (c) Ina mistari pacha mitatu
	Pembetatu guni	(a) Ina pande tatu zisizolingana (b) Ina pembe tatu ambazo hazilingani (c) Haina mistari pacha

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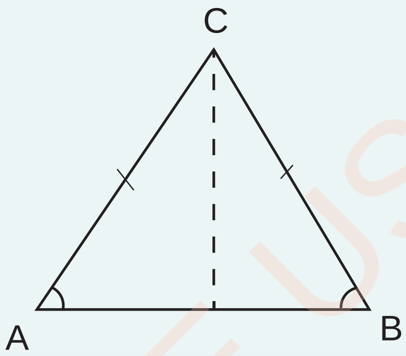
Zoezi la 6

1. Andika sifa za pembetatu mraba.
2. Nini tofauti ya pembetatu sawa na pembetatu pacha?
3. Taja aina za pembetatu.
4. Pembetatu sawa ina peo ngapi?
5. Kwa nini umbo lifuatalo linaitwa pembetatu pacha?



Eneo la mstatili, mraba na pembetatu

Eneo la umbo ni sehemu yote ya umbo husika. Eneo hilo linaweza kupatikana kwa kuligawa umbo katika miraba midogomidogo inayolingana na kuihesabu au kwa kutumia vipimo vya umbo hilo na kanuni.

Eneo la Mstatili

Shughuli ya 3: Kutafuta eneo la mstatili kwa kuhesabu miraba

Hatua:

1. Chora mstatili *ABCD* wenye urefu wa miraba 8 na upana wa miraba 6 kwenye karatasi ya miraba (karatasi ya grafu).

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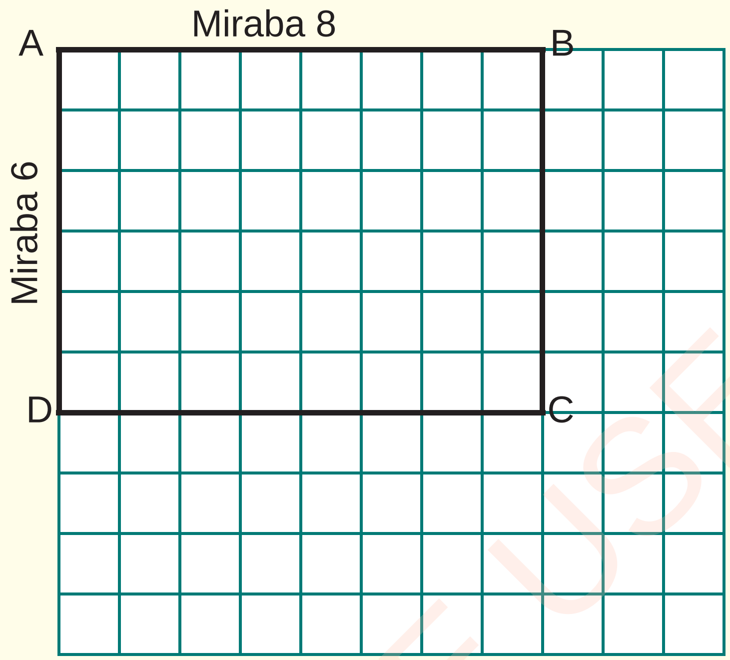
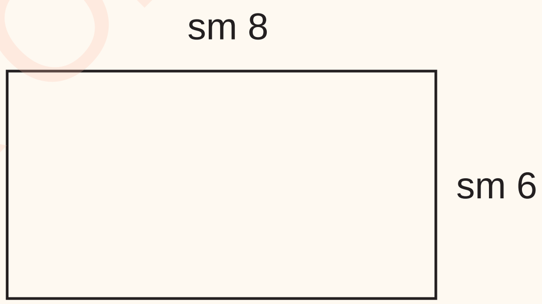
2. Hesabu miraba midogo katika mstatili ABCD.
3. Idadi ya miraba ndio eneo la mstatili ABCD.



Katika mstatili *ABCD,* kuna miraba 48. Eneo la mstatili huo ni miraba 48.

Mfano wa 1

Kutafuta eneo la mstatili kwa kutumia kanuni na vipimo.



Njia

Kanuni ya kutafuta eneo la mstatili ni urefu kuzidisha na upana.

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Urefu ni sm 8 na upana ni sm 6.

Eneo la mstatili = urefu x upana

= sm 8 × sm 6

= sentimeta za eneo 48 au sm^2 48.

Kwa hiyo, eneo ni sm^2 48.

Mfano wa 2

(a) Eneo la mstatili ni sm^2 800. Ikiwa urefu wake ni sm 40, tafuta upana wake.

Njia:

Eneo = sm^2 800.

Urefu = sm 40.

Upana = ?

Eneo la mstatili = urefu × upana.

$sm^2 800$ = sm 40 × upana.

Ili kupata upana,

$$\text{upana} = \frac{sm^2 800}{sm\ 40}$$

$$= \frac{\cancel{sm} \times sm\ 800}{\cancel{sm}\ 40}$$

$$= sm\ 20.$$

Kwa hiyo, upana wa mstatili huo ni sm 20.

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(b) Urefu wa uso wa kitabu ni sm 30 na upana wake ni sm 20. Tafuta eneo lake.

Njia

Uso wa kitabu una umbo la mstatili.

Eneo la mstatili = urefu × upana.

urefu = sm 30.

upana = sm 20.

Eneo = sm 30 × sm 20

= sm^2 600.

Kwa hiyo, eneo la uso wa kitabu ni sm^2 600.

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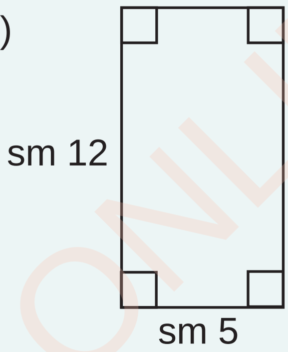
Zoezi la 7

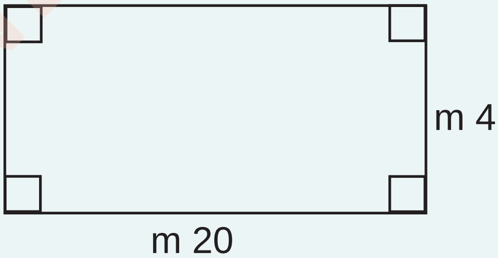
Jibu maswali yanayofuata.

1. Tafuta eneo la kila umbo lifuatalo:

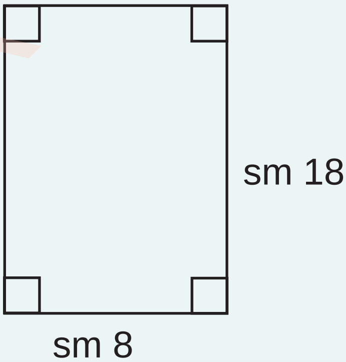
(a)



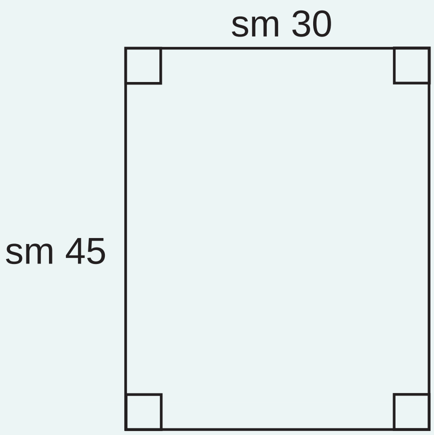
(b)



(c)



(d)



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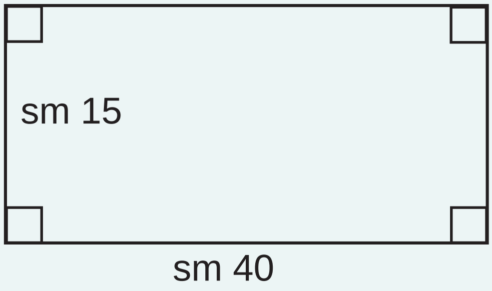
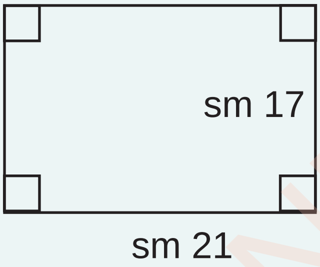
(e)



(f)



2. Mstatili una urefu wa sm 10 na upana sm 9. Tafuta eneo lake.
3. Eneo la mstatili ni $m^2$100 na upana m 4. Tafuta urefu wake.
4. Uso wa meza ya mwalimu una urefu wa sm 80 na upana wa sm 60. Tafuta eneo la uso wa meza hiyo.
5. Eneo la shamba la shule ni meta za eneo 820. Ikiwa urefu wake ni meta 41, nini upana wake?
6. Chumba cha darasa kina urefu wa meta 7 na upana wa meta 6. Tafuta eneo la sakafu ya darasa hilo.
7. Mstatili una urefu wa sm 35 na upana sm 26. Tafuta eneo lake.
8. Barabara ina urefu wa meta 8 800 na upana wa meta 9. Tafuta eneo lake.
9. Nini eneo la bustani ya mstatili yenye vipimo vya meta 15 kwa meta 330?
10. Tafuta eneo la karatasi yenye urefu wa sentimeta 32 na upana wa sentimeta 20.
11. Urefu wa mstatili ni meta 215. Eneo lake ni meta za eneo 19 780. Tafuta upana wa mstatili huo katika sentimeta.

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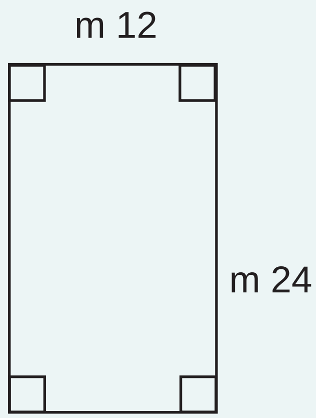
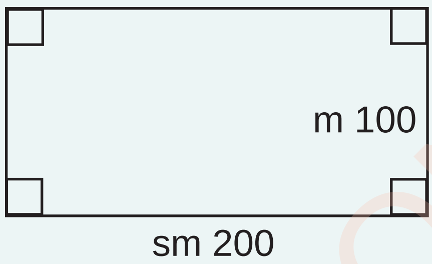
12. Tafuta eneo la kila umbo katika maumbo yafuatayo:

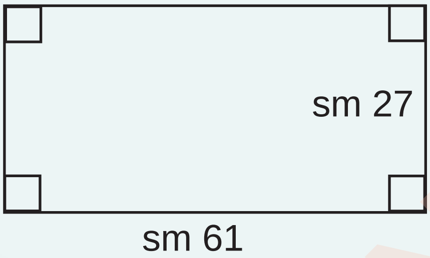
(a)



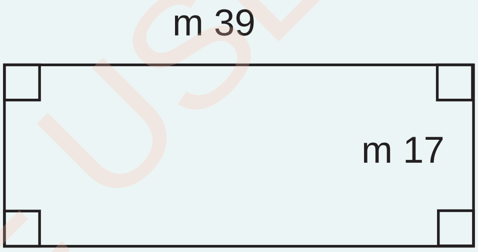
(b)



(c)



(d)



Eneo la mraba

Shughuli ya 4: Kutafuta eneo la mraba kwa kuhesabu miraba

Kutafuta eneo la mraba kwa kuhesabu miraba.

Hatua:

1. Chora mraba *EFGH* wenye miraba 7 katika ulalo na 7 katika wima kwenye karatasi ya miraba (karatasi ya grafu).
2. Hesabu miraba yote katika mraba *EFGH.*

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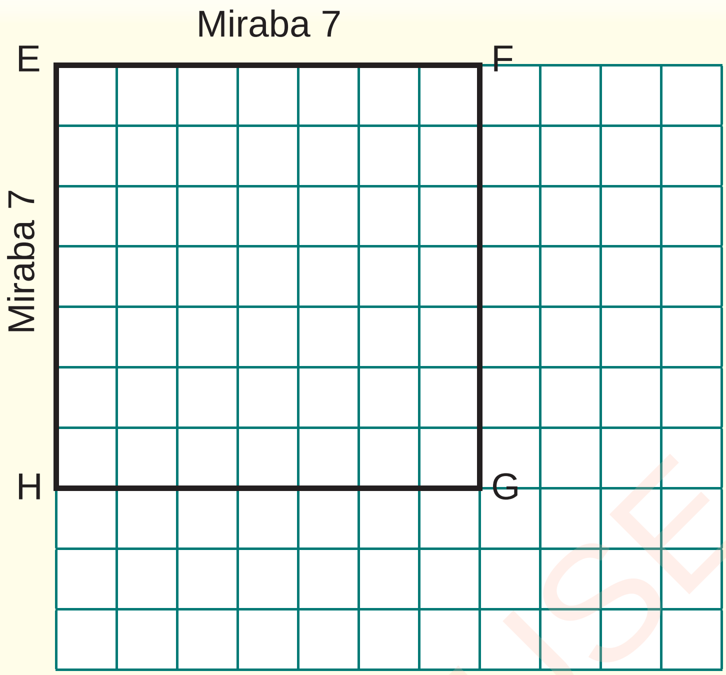
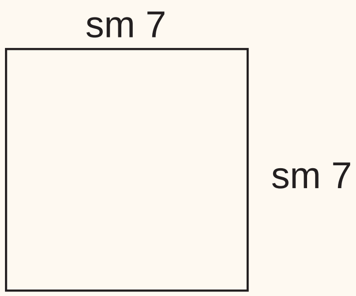


3. Idadi ya miraba ni sawa na eneo la mraba.
4. Katika mraba *EFGH* idadi ya miraba yote ni 49.

   Kwa hiyo, eneo la mraba ni miraba 49.

Mfano wa 1

Kutafuta eneo la mraba kwa kutumia kanuni na vipimo.



Njia

Kanuni ya kutafuta eneo la mraba ni upande kuzidisha na upande.

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Eneo la mraba = upande × upande.

Upande = sm 7.

Eneo = sm 7 × sm 7

= sm^2 49.

Kwa hiyo, eneo la mraba ni sm^2 49.

Mfano wa 2

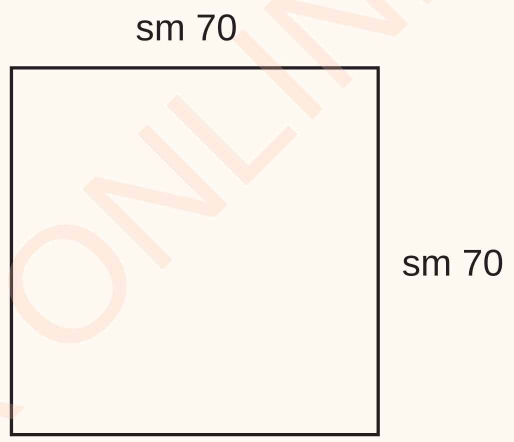
Umbo la dirisha lina urefu wa sm 70 na upana wa sm 70. Tafuta eneo la dirisha hilo.

Njia

Uso wa dirisha hili ni mraba.

Upande wa kwanza (urefu) = sm 70.

Upande wa pili (upana) = sm 70.



Eneo la mraba = upande × upande

= sm 70 × sm 70

= sm za eneo 4 900.

Kwa hiyo, dirisha lina sm^2 4 900.

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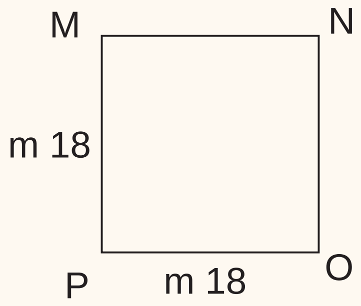
Mfano wa 3

Tafuta eneo la mraba ufuatao.



Njia

Upande wa mraba *MNOP* ni m 18.

Eneo la mraba = upande × upande

= m 18 × m 18

= m^2 324.

Kwa hiyo, eneo la mraba ni m^2 324.

Mfano wa 4

Eneo la mraba ni sm^2 576. Tafuta urefu wa upande wake.

Njia

Eneo = sm^2 576.

Upande = ?

upande × upande = eneo la mraba

= sm^2 576.

$$\sqrt{upande \times upande} = \sqrt{sm^2 576}$$

$$upande = \sqrt{sm\ 24 \times sm\ 24}$$

= sm 24.

Kwa hiyo, upande = sm 24.

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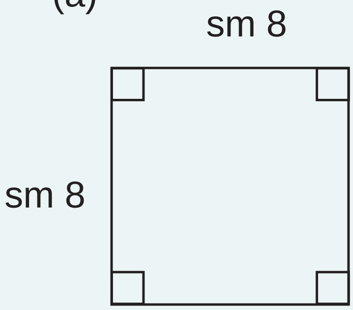
Zoezi la 8

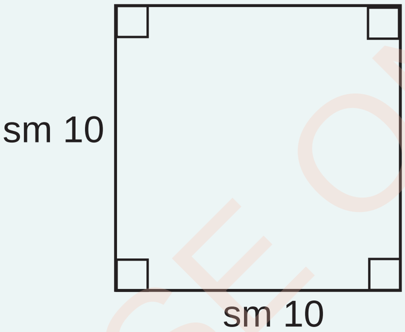
Jibu maswali yafuatayo:

1. Tafuta eneo la kila umbo:

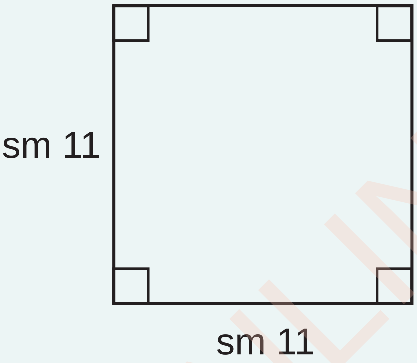
(a)



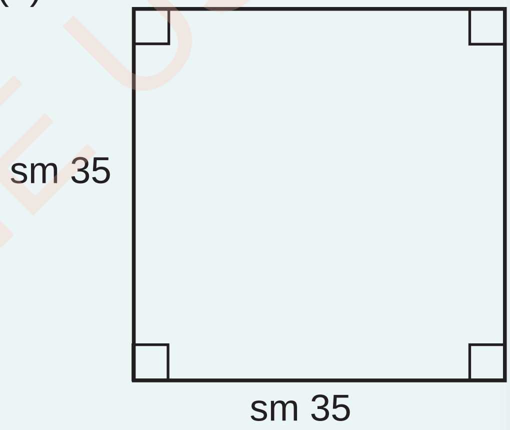
(b)



(c)



(d)



2. Mraba una upande wa sentimeta 40. Nini eneo lake?

3. Eneo la bustani iliyo mraba ni meta za eneo 441. Upande mmoja wa bustani hiyo una urefu gani?

4. Tafuta eneo la mraba wenye urefu wa sentimeta 50.

5. Mraba una sentimeta za eneo 784. Nini urefu wa upande wake?

6. Sakafu ya darasa yenye umbo la mraba ina upande wa meta 9. Nini eneo la sakafu hiyo?

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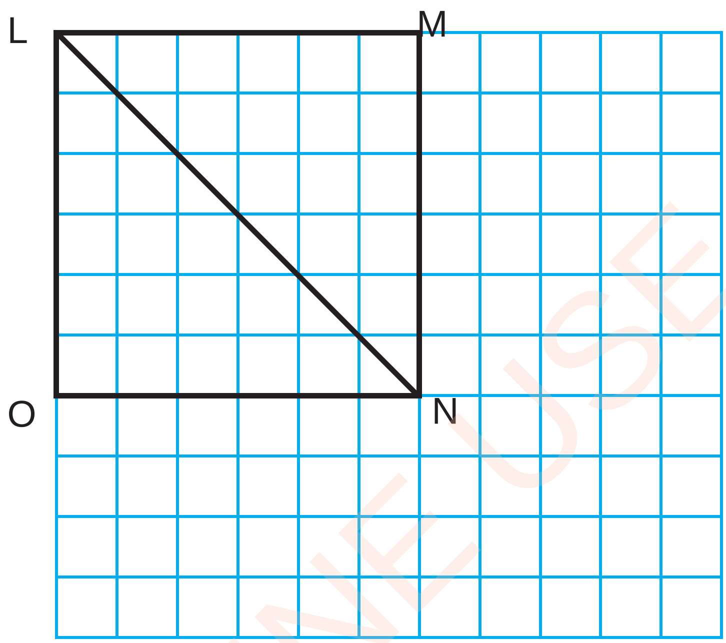
Eneo la pembetatu

Shughuli ya 5: Kutafuta eneo la pembetatu kwa kuhesabu miraba



Hatua:

1. Chora mraba LMNO wenye miraba 6 kwa 6 katika karatasi ya grafu.
2. Chora mstari kuunganisha LN ili kupata pembetatu mbili LMN na LON.
3. Hesabu miraba kamili na miraba ambayo ni nusu katika pembetatu LON.

   Miraba iliyo kamili = 15.

   Miraba iliyo nusu = 6.

   Nusu miraba miwili hufanya mraba kamili mmoja.

   Nusu miraba ipo 6 ambayo ni sawa na miraba $\frac{1}{2} \times 6 = 3$.

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Kwahiyo, nusu miraba 6 ni sawa na miraba kamili 3.

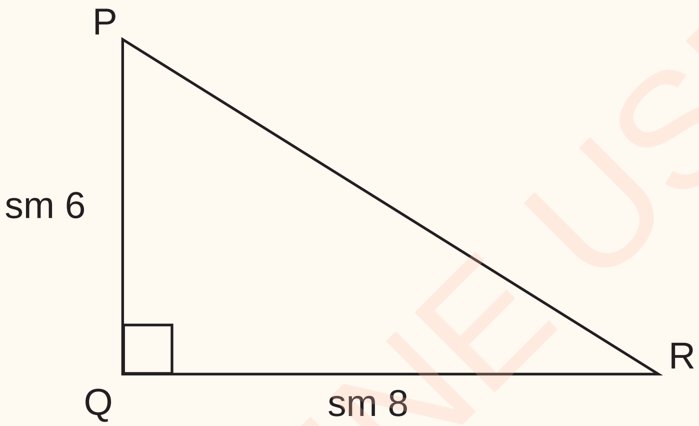
Jumla ya miraba = 15 + 3 = 18.

Kwa hiyo, eneo la pembetatu LON ni sawa na miraba 18.

Eneo hilo ni sawa na eneo la pembetatu LMN.

Mfano wa 1

Tafuta eneo la pembetatu PQR kwa kutumia kanuni.



Njia

Kitako = sm 8.

Kimo = sm 6.

Eneo la pembetatu $= \frac{1}{2} \times \text{kitako} \times \text{kimo}$

$= \frac{1}{2} \times \text{sm } 8 \times \text{sm } 6$

$= \text{sm}^2 \frac{48}{2}$

$= \text{sm}^2\ 24.$

Kwa hiyo, eneo la pembetatu PQR = sm^2 24.

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Mfano wa 2

Tafuta eneo la pembetatu yenye kimo cha m10 na kitako cha m 15.

Njia

Kimo = m 10.

Kitako = m 15.

Eneo la pembetatu $= \frac{1}{2} \times$ kitako $\times$ kimo

$= \frac{1}{2} \times$ m 15 $\times$ m 10

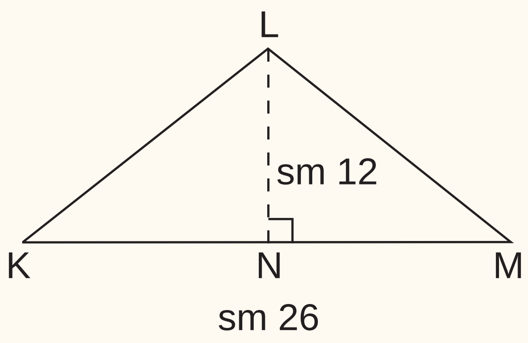
$=$ sm^2 $\frac{150}{2}$

$=$ m^2 75.

Kwa hiyo, eneo la pembetatu ni m^2 75.

Mfano wa 3

(a) Tafuta eneo la pembetatu KLM.



Njia

Kitako ni $\overline{KM}$ = sm 26.

Kimo ni $\overline{LN}$ = sm 12.

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Eneo la pembetatu $= \frac{1}{2} \times$ kitako $\times$ kimo.

Eneo la pembetatu KLM $= \frac{1}{2} \times$ kitako $\times$ kimo

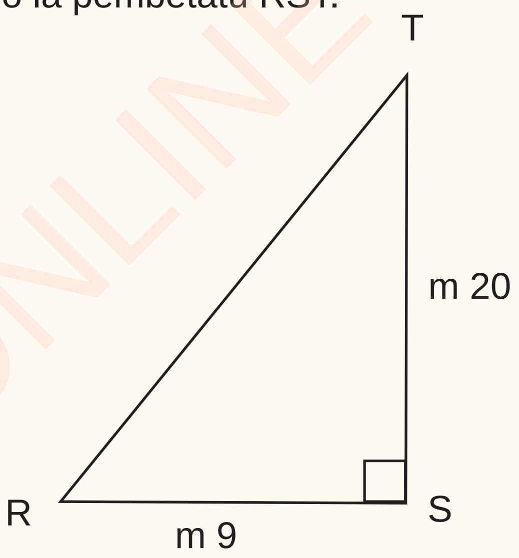
$$= \frac{1}{2} \times \text{sm } 26 \times \text{sm } 12$$

$$= \text{sm}^2 \frac{26 \times 12}{2}$$

$$= \text{sm}^2 \frac{312}{2} = \text{sm}^2 156.$$

Kwa hiyo, eneo la pembetatu KLM ni sm^{2}156.

(b) Tafuta eneo la pembetatu RST.



Njia

Eneo la pembetatu $= \frac{1}{2} \times$ kitako $\times$ kimo.

Kitako ni $\overline{RS}$ = m 9.

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Kimo ni $\overline{ST}$ = m 20.

$$\text{Eneo} = \frac{1}{2} \times \text{m } 9 \times \text{m } 20$$

$$= \text{m}^2 \frac{180}{2}$$

$$= \text{m}^2\ 90.$$

Kwa hiyo, eneo la pembetatu RST ni m^2 90.

(c) Eneo la pembetatu ni m^2 225. Ikiwa kitako kina urefu wa m 30, tafuta urefu wa kimo.

Njia

$$\text{Eneo} = \frac{1}{2} \times \text{kitako} \times \text{kimo.}$$

Eneo = m^2 225.

Kitako = m 30.

Kimo = ?

$$\text{m}^2\ 225 = \frac{1}{2} \times \text{m } 30 \times \text{kimo}$$

$$= \frac{\text{m } 30}{2} \times \text{kimo}$$

$$= \text{m}15 \times \text{kimo.}$$

Ili kupata kimo,

$$= \frac{\cancel{\text{m}} \times \text{m } 225}{\cancel{\text{m}}15}$$

$$= \text{m } 15.$$

Kwa hiyo, kimo ni m 15.

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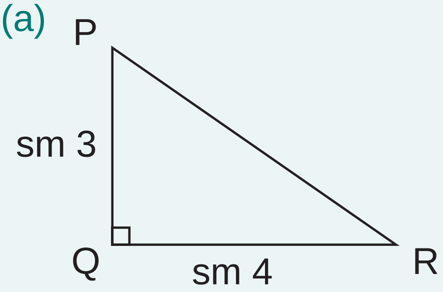
Zoezi la 9

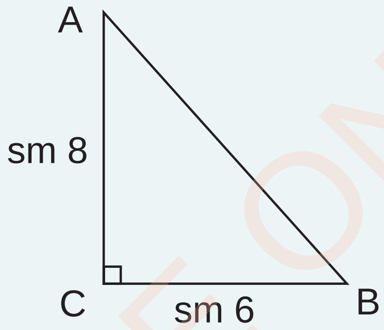
Jibu maswali yafuatayo:

1. Tafuta eneo la kila umbo.

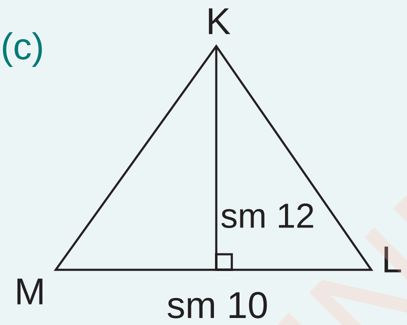
(a)



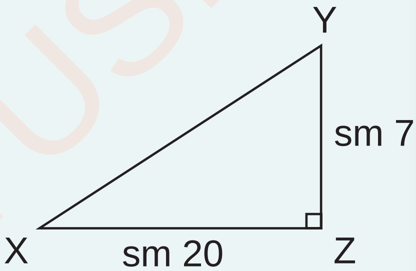
(b)



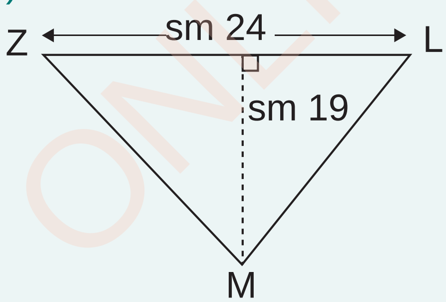
(c)



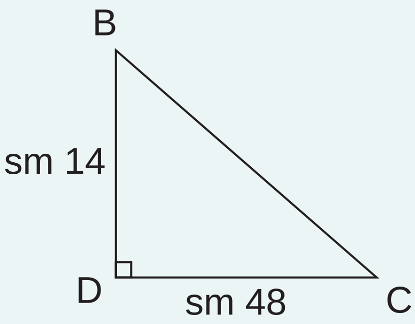
(d)



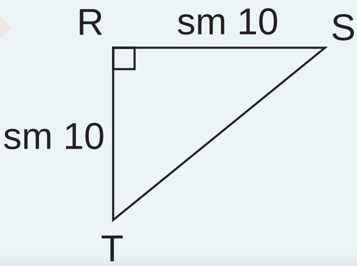
(e)



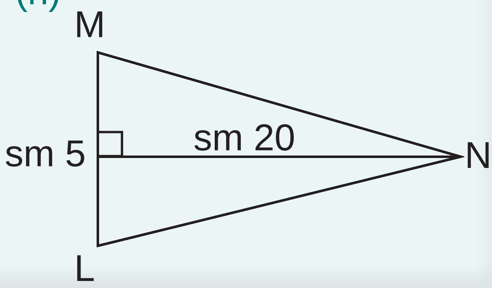
(f)



(g)



(h)



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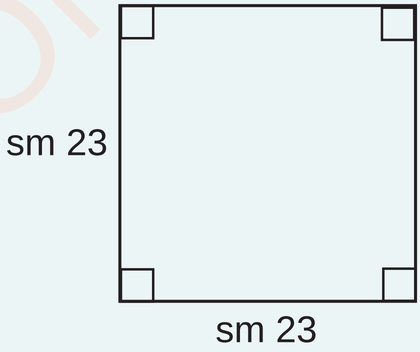
2. Tafuta eneo la pembetatu yenye kimo cha meta 16 na kitako cha meta 19.
3. Eneo la pembetatu ni sm^2 600, kimo cha pembetatu hiyo ni sm 30. Tafuta urefu wa kitako.
4. Pembetatu ina meta za eneo 195. Ikiwa kitako chake ni meta 26, je, urefu wa kimo chake ni meta ngapi?

Zoezi la 10

Jibu maswali yafuatayo:

1. Orodhesha aina tano za pembe.
2. Pembe nyoofu inaundwa na pembe mraba ngapi?
3. Pembe ndogo kuliko zote ni ipi?
4. Andika sifa za pembetatu guni.
5. Andika sifa za pembetatu sawa.
6. Andika aina ya pembetatu yenye pembe mraba moja na pembekali mbili?
7. Andika kanuni ya kutafuta eneo la mstatili.
8. Tafuta eneo la umbo lifuatalo.



9. Eneo la mraba ni sentimeta za eneo 900. Tafuta urefu wa upande wake.

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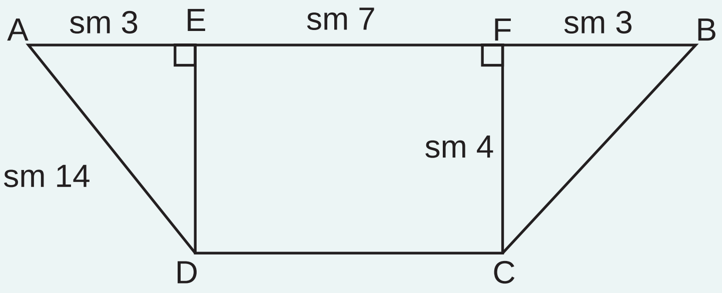
10. Mraba una upande wa sentimeta 41. Nini eneo lake?

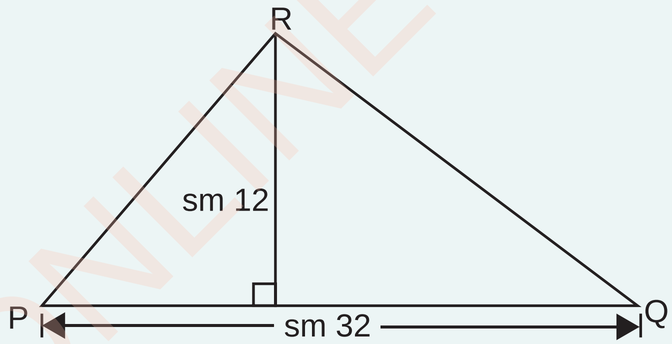
11. Tafuta eneo la umbo lifuatalo:



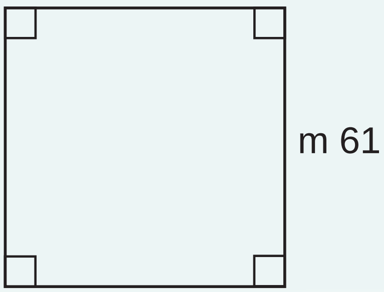
12. Eneo la pembetatu ni sentimeta za eneo 1 485. Ikiwa kitako kina urefu wa sentimeta 66, tafuta urefu wa kimo.

13. Pembetatu ina kimo meta 25 na kitako meta 32. Nini eneo lake?

14. Tafuta eneo la umbo PQR.



15. Tafuta eneo la mraba ufuatao:



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16. Mstatili RSTU una urefu sentimeta 18 na upana sentimeta 14. Tafuta eneo la mstatili huo.
17. Eneo la mstatili ni sentimeta za eneo 1134. Ikiwa urefu wake ni sentimeta 42, tafuta upana wake.
18. Eneo la pembetatu ni sentimeta za eneo 372. Iwapo kimo chake ni sentimeta 24, tafuta urefu wa kitako chake.
19. Mstatili una urefu wa sentimeta 37 na upana wa sentimeta 27. Tafuta eneo la mstatili huo.
20. Tafuta eneo la pembetatu yenye kitako cha sm 70 na kimo sm 84.

Jikumbushe

1. Pembe huundwa pale miale miwili inapokutana.
2. Kanuni ya kutafuta eneo la mstatili ni urefu × upana.
3. Kanuni ya kutafuta eneo la pembetatu ni $\frac{1}{2}$ × kitako × kimo.
4. Kimo cha pembetatu huweza kuwa ndani au nje ya pembetatu.
5. Kanuni ya kutafuta eneo la mraba ni upande × upande.
6. Peo ni nukta ambapo miale miwili inakutana.

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Sura ya Kumi na Tano

Aljebra

Aljebra ni tawi la Hisabati ambalo namba na herufi hutumika. Herufi hizo huwakilisha vitu au namba. Katika sura hii, utajifunza sentensi za aljebra na utatumia matendo ya Hisabati kurahisisha sentensi zenye aljebra.

Sentensi za aljebra

Katika maisha ya kila siku, tunatumia aljebra katika kurahisisha hesabu. Kwa mfano, familia 4 zinafuga kuku na kila familia ina kuku mmoja. Hivyo, hizo familia zina jumla ya kuku inayoweza kuandikwa hivi:

Jumla ya kuku: $k + k + k + k = 4k$.

Pia, hizo familia nne kila moja ina mbuzi kama ifuatavyo:
Familia ya kwanza ina mbuzi 2, familia ya pili ina mbuzi 3, familia ya tatu ina mbuzi 2 na familia ya nne ina mbuzi 4. Jumla ya mbuzi katika familia zote nne inaweza kuandikwa hivi:

Jumla ya mbuzi: $2m + 3m + 2m + 4m = 11m$.

Pia, hizo familia kila moja ina watoto kama ifuatavyo:

Jumla ya watoto: $2w + 3w + 3w + 4w = 12w$.

Hivyo, familia hizo zina watoto 12.

Namba zilizopatikana katika familia hizo ni **4k**, **11m** na **12w**. Hii ni mifano ya **mitajo**. Katika mitajo hii, herufi **k** inawakilisha kuku, **m** inawakilisha mbuzi na **w** inawakilisha watoto.

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Katika mtajo **4k**, namba 4 huitwa kizigeu cha **k** na herufi **k** huitwa kigeu cha 4. Vilevile, katika mtajo **11m**, **11** ni kizigeu na **m** ni kigeu. Katika mtajo **12w**, **12** ni kizigeu na **w** ni kigeu. Pia, mtajo unaweza kuwa na vigeu viwili kama ifuatavyo; **8km** ambapo 8 ni kizigeu cha **k** na **m, k** na **m** ni vigeu vya 8.

Mfano wa 1

Katika mitajo ifuatayo, bainisha kigeu na kizigeu.

(a) 6a (b) y

Jibu

(a) Katika mtajo 6a, kigeu ni **a** na kizigeu ni 6.

(b) Katika mtajo **y**, kigeu ni **y** na kizigeu ni 1.

Mfano wa 2

Katika mitajo ifuatayo, andika kigeu na kizigeu.

(a) 3pq (b) 5wz

Jibu

(a) Katika mtajo **3pq**, vigeu ni **p** na **q** na kizigeu ni 3.

(b) Katika mtajo **5wz**, vigeu ni **w** na **z** na kizigeu ni 5.

Sentensi zenye aljebra zinaundwa na mitajo. Kwa mfano, **4k**, **11m** na **12w**.

Pia, sentensi zenye aljebra zinaweza kuundwa na mitajo inapounganishwa kwa matendo ya Hisabati.

Kwa mfano: 4k + 6k; 11m – m; 6m × 3; 12w ÷ 2n

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Zoezi la 1

Jibu maswali yafuatayo:

1. Katika mitajo ifuatayo andika kigeu.

(a) 7mn (b) 5p (c) n

(d) 10tp (e) 3yw

2. Katika mitajo ifuatayo andika kizigeu

(a) 3pq (b) 4ab (c) pk

(d) m (e) a

Kujumlisha mitajo

Mitajo inayofanana ni ile yenye vigeu vya aina moja, mfano **4k**, **8k**, **5k** na **7k**. Mitajo inayofanana inaweza kuunganishwa au kujumlishwa kupata mtajo mmoja. Mitajo isiyofanana ni ile yenye vigeu tofauti, mfano **3a**, **4m**, **6p** na **7w**. Mitajo isiyofanana haiwezi kujumlishwa kupata mtajo mmoja.

Mifano

Jibu maswali yafuatayo:

1. (a) 4k + 8k = (b) 6n + n + 2n =
2. (a) 2p + 4a + p + 2a = (b) 4m + 3n + 4m + 3n =

1. (a) 4k + 8k =

Njia

Jumlisha kwanza vizigeu kama ifuatavyo:

4 + 8 = 12.

Hivyo, 4k + 8k = 12k.

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(b) $6n + n + 2n =$

Njia

Jumlisha kwanza vizigeu: $6 + 1 + 2 = 9$.

Hivyo, $6n + n + 2n = 9n$.

2. (a) $2p + 4a + p + 2a =$

Njia

Weka pamoja mitajo inayofanana kama ifuatavyo:

$2p + p + 4a + 2a$.

Jumlisha vizigeu vya mitajo inayofanana ya **p**: $2 + 1 = 3$.

Jumlisha vizigeu vya mitajo inayofanana ya **a**: $4 + 2 = 6$.

Hivyo, $2p + p + 4a + 2a = 3p + 6a$.

(b) $4m + 3n + 4m + 3n =$

Njia

Jumlisha mitajo inayofanana: $(4 + 4)m + (3 + 3)n = 8m + 6n$.

Hivyo, $4m + 3n + 4m + 3n = 8m + 6n$.

Zoezi la 2

Jibu maswali yafuatayo:

1. $3p + 4p + 5p =$
2. $2m + 7m + m =$
3. $m + n + m + n + m =$
4. $p + w + p + w + p + w + w =$
5. $5n + k + 2k + 3n =$
6. $6m + 2n + m + n =$
7. $x + 3y + 4x + y + 2y =$
8. $x + 4w + 2w + 2w + x + 3x =$
9. $15m + 16p + 3t + t =$
10. $5k + 2pq + k + pq =$

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11. 2p+ q + b + 3b + 2q = **12.** 6ay + 4ab + 4ay + 8ab =

13. 3a + 3b + 3c = **14.** 2w + 5m + 5m + 8w =

15. 6gh + 6gh + 6gh =

Kutoa mitajo

Unaweza kutoa mitajo inayofanana. Katika kutoa mitajo inayofanana, toa vizigeu.Huwezi kutoa mitajo isiyofanana.

Mifano

Jibu maswali yafuatayo:

1. (a) 4x – x = (b) 5ae – 2ab – 2ae =
2. 6k – 6n =

1. (a) 4x – x =

Njia

Toa kwanza vizigeu: 4 – 1 = 3.
Hivyo, 4x – x = 3x.

(b) 5ae – 2ab – 2ae =

Njia

Weka pamoja mitajo inayofanana kisha rahisisha.

5ae – 2ae – 2ab = (5 – 2) ae – 2ab
= 3ae – 2ab.

Hivyo, 5ae – 2ab – 2ae = 3ae – 2ab.

2. 6k – 6n =

Katika hili swali hakuna mitajo inayofanana hivyo,
6k – 6n = 6k – 6n.

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Zoezi la 3

Jibu maswali yafuatayo:

1. $2m - m =$

2. $4m - 2m =$

3. $6k - k - 3k =$

4. $10n - 5n - n =$

5. $10x - 4x - x =$

6. $5a - 2a =$

7. $4t - t - 2 =$

8. $10a - 2a - 8a =$

9. $8x - 8 =$

10. $4n - 4k =$

11. $m - m =$

12. $7e - 7e =$

13. $7mk - 4mk - mk =$

14. $8ad - ad - 2ad =$

15. $16x - x - 14x =$

16. $2p - p =$

Kujumlisha na kutoa mitajo

Vilevile, unaweza kujumlisha na kutoa mitajo inayofanana.

Mifano

Rahisisha mitajo katika maswali yafuatayo:

1. (a) $2a + 3b - a =$ (b) $4xy - xw + 3xw + 3xy =$
2. $3a - a + 4pq - pq =$

1. (a) $2a + 3b - a =$

Njia

(a) Weka pamoja mitajo inayofanana kisha rahisisha. (Panga mitajo inayofanana pamoja na toa vizigeu)

$$2a + 3b - a = 2a - a + 3b$$
$$= a + 3b.$$

Hivyo, $2a + 3b - a = a + 3b$.

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(b) $4xy - xw + 3xw + 3xy =$

Njia

Weka pamoja mitajo inayofanana kisha rahisisha
(Panga mitajo inayofanana pamoja)

$$4xy - xw + 3xw + 3xy = 4xy + 3xy + 3xw - xw$$
$$= (4+3)xy + (3-1)xw$$
$$= 7xy + 2xw.$$

Hivyo, $4xy - xw + 3xw + 3xy = 7xy + 2xw.$

2. $3a - a + 4pq - pq =$

Njia

Weka pamoja mitajo inayofanana kisha rahisisha

$$3a - a + 4pq - pq = 3a - a + 4pq - pq$$
$$= (3-1)a + (4-1)pq$$
$$= 2a + 3pq.$$

Hivyo, $3a - a + 4pq - pq = 2a + 3pq.$

Zoezi la 4

Jibu maswali yafuatayo:

1. $8a + 6a - a =$

2. $7m - m + 2m =$

3. $46 + 3b - 2b =$

4. $8t + t - 8t =$

5. $y + 4y - 3y =$

6. $5t - 4t + t - t =$

7. $12e - 2e =$

8. $9n - 8n + n =$

9. $15k - 4k + 3k - k =$

10. $7w - 5w + 2w =$

11. $10b + 2a - 5b =$

12. $16pa + 4q - 6pa - 3q =$

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13. $16y - 10y + 2a + 11y =$

14. $8wz + 8wy - wz - 2wy =$

15. $6e - 4f + 6f - e =$

16. $4w + 6z - 2w - 2z =$

17. $4n + 2n + n =$

18. $9m + 6n - m + n =$

19. $10a - 10b - 10a + 10b =$

20. $xy + 3xy + 2xy - xy =$

Kuzidisha mitajo

Unapozidisha mitajo, zidisha vizigeu, kisha zidisha vigeu. Kama ilivyo katika namba za kawaida, 0 ikizidishwa kwa kigeu chochote utapata 0.

Mifano

Jibu maswali yafuatayo:

1. (a) $y \times y =$ (b) $4a \times 4 =$

2. (a) $3k \times 2k =$ (b) $n \times 3n =$

1. (a) $y \times y =$

Njia

Katika hili swali kuna kigeu cha aina moja nacho ni **y** na kizigeu ni 1. Pia, herufi ikizidishwa kwa yenyewe unapata kipeo cha pili.

Hivyo, $y \times y = y^2$.

(b) $4a \times 4 =$

Njia

Katika hili swali kuna namba 4 na kizigeu ni 4. Hivyo, $4 \times 4a = 16a$.

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2. (a) $3k \times 2k =$

Njia

Bainisha kwanza vizigeu ambavyo ni 3 na 2. Pia, kuna vigeu viwili vya aina moja navyo ni k.

$3k \times 2k = (3 \times 2) \times (k \times k)$ (zidisha vizigeu na vigeu)

$= 6k^2$ (kizigeu ni 6 na kigeu ni k)

Hivyo, $3k \times 2k = 6k^2$.

(b) $n \times 3n =$

Njia

Bainisha kwanza vizigeu na vigeu kisha rahisha.

$n \times 3n = (1 \times 3) \times (n \times n)$

$= 3n^2$.

Hivyo, $n \times 3n = 3n^2$.

Zoezi la 5

Jibu maswali yafuatayo:

1. $b \times b =$

2. $2n \times 2n =$

3. $3p \times p =$

4. $3y \times 3y =$

5. $t \times k \times r =$

6. $4a \times 3b \times 2c =$

7. $3a \times 3b \times a =$

8. $m \times m =$

9. $4k \times 4t =$

10. $3a \times 2e \times 4 =$

11. $2p \times t \times 3p =$

12. $y \times w \times 2y \times 3w =$

13. $4a \times b \times a \times b =$

14. $10t \times 10p =$

15. $6p \times q \times 6p =$

16. $3b \times 3 \times 4b =$

17. $3na \times 4 \times 2n =$

18. $p \times q \times 5q \times 5w =$

19. $3tp \times 0 =$

20. $7vfk \times kp =$

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Kugawanya mitajo

Unapogawanya mitajo, gawanya vizigeu na gawanya vigeu vinavyofanana.

Mifano

Rahisisha mitajo ifuatayo:

1. (a) $4a \div 2a =$ (b) $4b \div 4b =$
2. (a) $4k^2 \div 2k =$ (b) $6a^2b \div 3ab =$

1. (a) $4a \div 2a =$

Njia

(a) Bainisha vizigeu na vigeu, kisha gawanya vigeu kwa vigeu. Pia, gawanya vizigeu kwa vizigeu.
$4a \div 2a = (4 \div 2) \times (a \div a)$. Gawanya vizigeu: $4 \div 2 = 2$.
Pia, gawanya vigeu: $a \div a = 1$.
$= 2 \times 1$ (zidisha jibu la vizigeu na vigeu)
$= 2$

Hivyo, $4a \div 2a = 2$.

(b) $4b \div 4b =$

Njia

Weka pamoja vigeu na vizigeu:
$4b \div 4b = (4 \div 4) \times (b \div b)$.
Gawanya vizigeu $4 \div 4 = 1$. Pia, gawanya vigeu: $b \div b = 1$.
Hivyo, $4b \div 4b = 1$.

2. (a) $4k^2 \div 2k =$

Njia

(a) $4k^2 \div 2k = (4 \div 2) \times (k^2 \div k)$

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$= 2 \times k$

$= 2k.$

Hivyo, $4k^2 \div 2k = 2k.$

(b) $6a^2b \div 3ab =$

Njia

$6a^2b \div 3ab = (6 \div 3) \times (a^2 \div a) \times (b \div b)$

$= 2 \times a \times 1$

$= 2a.$

Hivyo, $6a^2b \div 3ab = 2a.$

Zoezi la 6

Jibu maswali yafuatayo:

1. $6b \div 2 =$
2. $3b \div b =$
3. $4c \div 4c =$
4. $8b \div 2b =$
5. $6b \div 3b =$
6. $10y \div y =$
7. $15a \div 5a =$
8. $5a^2 \div a =$
9. $8k^2 \div 8 =$
10. $10p^2 \div 2p =$
11. $t^2 \div t =$
12. $4m^2 \div 2m^2 =$
13. $6k^2p \div 2p =$
14. $10n^2 \div 10n =$
15. $18x^2 \div 9x =$
16. $10y^2p \div 10yp =$
17. $12nm^2 \div 12m =$
18. $10a^2b^2 \div 10ab =$
19. $12m^2n \div 3m^2 =$
20. $8y^2w^2 \div 4yw^2 =$

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Zoezi la 7

Jibu maswali yafuatayo:

1. $3n + n =$
2. $7n - p =$
3. $8k - 4k =$
4. $3a \times b \times b =$
5. $4y + 2y =$
6. $8n - 6n =$
7. $8p^2 \div p^2 =$
8. $3n \times n =$
9. $4k^2 \div 2k^2 =$
10. $6e \div e =$
11. $4p^2 \div 4 =$
12. $6k^2 \div 6k =$
13. $16m \div 4m =$
14. $10n^2 \div 10n =$
15. $18x^2 \div 9x =$
16. $pt^2 \div pt =$
17. $5ya^2 \div 5ya =$
18. $12t^2p \div 4tp =$
19. $10ab^2c \div 5ab =$
20. $a^2b^2e \div abe =$
21. $10 + 2y - 10 =$
22. $5a + 3b - 2a - 2b =$
23. $9t - t + z - z =$
24. $6y^2 - 2x^2 - 2y^2 + 3x^2 =$

Jikumbushe

1. Mitajo inaundwa na vigeu na vizigeu.
2. Sentensi zenye aljebra zinaundwa na mitajo.
3. Mitajo inayofanana ina vigeu vinavyofanana.
4. Kujumlisha mitajo inayofanana, jumlisha vizigeu.
5. Kutoa mitajo inayofanana, toa vizigeu.
6. Mitajo isiyofanana haiwezi kuunganishwa kupata mtajo mmoja.
7. Kuzidisha au kugawanya mitajo, zidisha au gawanya vigeu, pia zidisha au gawanya vizigeu.

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Sura ya Kumi na Sita

Takwimu

Katika Darasa la Nne, ulijifunza kukusanya na kuwasilisha taarifa kwa kutumia picha. Katika sura hii, utajifunza kusoma, kutafsiri grafu kwa mihimili na kutafuta wastani.

Zoezi la 1: Marudio

1. Chunguza takwimu kwa picha inayoonesha vikombe vilivyouzwa kwa wiki moja.

Kipimo: Picha ya kikombe 1 inawakilisha vikombe 5

Siku	Vikombe
Jumatatu	
Jumanne	
Jumatano	
Alhamisi	
Ijumaa	
Jumamosi	
Jumapili	

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Jibu maswali yafuatayo:

(i) Siku ya Jumatatu viliuzwa vikombe vingapi?

(ii) Ni siku gani viliuzwa vikombe vingi zaidi?

(iii) Siku zipi viliuzwa vikombe kwa idadi sawa?

(iv) Je, siku ya Jumapili viliuzwa vikombe vingapi?

(v) Je, ni siku ipi viliuzwa vikombe vichache zaidi?

(vi) Andika tofauti ya idadi ya vikombe vilivyouzwa Jumanne na Jumapili.

(vii) Je, ni siku zipi viliuzwa vikombe chini ya 25?

2. Chunguza takwimu kwa picha inayoonesha idadi ya mahudhurio ya wanafunzi kuanzia darasa la tatu hadi la saba kwa siku ya Jumatatu.

Kipimo: Picha mwanafunzi 1 inawakilisha wanafunzi 10

Darasa	Wanafunzi
Darasa la tatu	
Darasa la nne	

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Darasa la tano	
Darasa la sita	
Darasa la saba	

Jibu maswali yafuatayo:

(i) Ni darasa lipi walihudhuria wanafunzi wachache zaidi? Walikuwa wangapi?

(ii) Darasa lipi walihudhuria wanafunzi wengi zaidi? Walikuwa wanafunzi wangapi?

(iii) Je, ni madarasa gani yalikuwa na idadi sawa ya wanafunzi? Walikuwa wanafunzi wangapi kwa kila darasa?

(iv) Ni wanafunzi wangapi walihudhuria darasa la tatu?

(v) Katika shule hiyo, wanafunzi wangapi walihudhuria siku ya Jumatatu?

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3. Tumia takwimu kwa picha kujibu maswali yanayofuata. Jedwali lifuatalo linaonesha idadi ya vitabu katika masomo matano yanayofundishwa darasa la tano katika mojawapo ya shule ya msingi.

Jina la Kitabu	Sayansi	Hisabati	Kiswahili	English	Maarifa ya Jamii
Idadi ya vitabu	35	20	30	40	15

(i) Chora grafu kwa mihimili kuonesha taarifa ya vitabu na idadi.

Kipimio: sm 1 inawakilisha vitabu 5 kwa wima
sm 1 inawakilisha upana wa mhimili

(ii) Somo gani lina idadi ya vitabu vingi zaidi?

(iii) Somo la English lina idadi ya vitabu vingapi zaidi ya Somo la Maarifa ya Jamii?

Wastani

Wastani hupatikana kwa kugawanya jumla ya vitu vyote kwa idadi yake.

Soma mifano ifuatayo ili kubaini dhana ya wastani.

(a) Ali alikuwa na maembe 6 na Sara alikuwa na maembe 2. Ili kila mmoja apate idadi sawa ya maembe, ilibidi wayaweke pamoja halafu wagawane kwa idadi sawa. Hii ni sawa na $6 + 2 = 8$. Chukua jumla ya maembe 8, gawanya kwa idadi yao ambayo ni 2, utapata 4. Hivyo, kila mmoja alipata maembe manne.

(b) Wanafunzi 5 katika Shule ya Msingi Msange walitumwa shambani kuvuna mahindi na kuyaleta shuleni. Walileta mahindi kama ifuatavyo: Musa alileta mahindi 5, Ramadhani mahindi 7, Mariamu mahindi 3, Neema mahindi 9 na

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Zacharia mahindi 6. Mwalimu aliwaambia wayagawe ili kila mmoja apate idadi sawa ya mahindi. Ili kila mmoja apate idadi sawa ya mahindi, mambo yafuatayo yalifanyika:

Hatua:

1. Waliyaweka mahindi yote pamoja;
2. Walijumlisha idadi hiyo ya mahindi:
   $5 + 7 + 3 + 9 + 6 = 30$.
3. Waligawanya mahindi 30 kwa idadi yao ambayo ni 5;
   $30 \div 5 = 6$.
   Hivyo, kila mmoja alipata mahindi 6.

Kwa kutumia mifano hiyo, utagundua kuwa, wastani wa vitu hupatikana kama ifuatavyo:

Wastani wa vitu ni jumla ya vitu gawanya kwa idadi ya vitu.

$$\text{Wastani} = \frac{\text{Jumla}}{\text{Idadi}}$$

Mfano wa 1

Umri wa wanafunzi wanne wa darasa la tatu katika Shule ya Msingi Mwenge ulikuwa kama ifuatavyo: Selina miaka 9, Ashura miaka 8, Emmanuel miaka 10 na Hassani miaka 9. Tafuta wastani wa umri wao.

Njia

1. Jumlisha umri wao; $9 + 8 + 10 + 9 = 36$.
2. Idadi yao ni wanafunzi 4.
3. $\text{Wastani} = \frac{\text{Jumla}}{\text{Idadi}}$

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$$= \frac{36}{4}$$

$$= 9.$$

Hivyo, wastani wa umri wa wanafunzi hao ni miaka 9.

Mfano wa 2

Tafuta wastani wa 5, 10, 15, 25 na 20.

Njia

1. Jumla ya namba zote ni 5 + 10 + 15 + 25 + 20 = 75.
2. Idadi ya namba ni 5.
3. $\text{Wastani} = \frac{\text{Jumla}}{\text{Idadi}}$

$$= \frac{75}{5}$$

$$= 15.$$

Wastani wa namba hizo ni 15.

Zoezi la 2

Jibu maswali yafuatayo:

1. Kulwa alinunua matenga ya nyanya sokoni kama ifuatavyo: Siku ya kwanza matenga 5, siku ya pili matenga 3 na siku ya tatu matenga 4. Kwa wastani alinunua matenga mangapi kwa siku?
2. Mfanyabiashara aliuza pikipiki kwa siku sita kama ifuatavyo: Jumatatu 5, Jumanne 4, Jumatano 7, Alhamisi 11, Ijumaa 12 na Jumamosi 15. Tafuta wastani wa pikipiki zilizouzwa kwa siku.

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3. Mahudhurio ya wanafunzi wa darasa la tano kwa wiki yalikuwa kama ifuatavyo:

Siku	Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa
Wanafunzi waliohudhuria	33	45	48	45	39

Tafuta wastani wa mahudhurio yao kwa siku.

4. Jedwali lifuatalo linaonesha mahudhurio ya wanafunzi shuleni kwa siku tano. Jibu maswali yanayofuata.

Siku	Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa
Idadi ya wanafunzi	330	350	340	300	280

(a) Tafuta wastani wa mahudhurio ya wanafunzi kwa kila siku.

(b) Siku zipi mahudhurio yalikuwa juu ya wastani?

5. Tafuta wastani wa shilingi 28 000, shilingi 32 000 na shilingi 96 000.

6. Iwapo magari saba yalibeba mahindi yenye uzito wa kilogramu zifuatazo: kg 1 050, kg 600, kg 800, kg 940, kg 900, kg 850 na kg 600. Kwa wastani kila gari lilibeba kilogramu ngapi za mahindi?

7. Watu saba walipima uzito kama ifuatavyo: kg 50, kg 59, kg 72, kg 45, kg 80, kg 52 na kg 48. Je, wastani wa uzito wao ni kiasi gani?

8. Ng'ombe wanne hutoa lita za maziwa zifuatazo: Lita 8, lita 15, lita 7 na lita 14. Tafuta wastani wa lita za maziwa.

9. Tafuta wastani wa sm 36, sm 54, sm 44, sm 50 na sm 66.

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10. Tumia jedwali linaloonesha taarifa za watoto kujibu maswali yanayofuata.

Jina	Uzito	Urefu
Kisuda	kg 35	sm 140
Amani	kg 32	sm 135
Furaha	kg 28	sm 142
Musa	kg 28	sm 128
Salimu	kg 25	sm 125

Maswali

(a) Tafuta wastani wa uzito wa watoto hao katika kilogramu.

(b) Tafuta wastani wa urefu wa watoto hao katika meta.

(c) Watoto wangapi wana uzito ulio juu ya wastani?

(d) Watoto wangapi wana urefu zaidi ya wastani?

Grafu kwa mihimili

Taarifa zinaweza kuwasilishwa kwa kutumia grafu za aina mbalimbali. Mojawapo ya grafu hizo ni grafu kwa mihimili.

Mfano wa 1

Chunguza grafu ifuatayo inayowasilisha taarifa ya kuku waliouzwa kwa siku tano za wiki, kisha jibu maswali yanayofuata.

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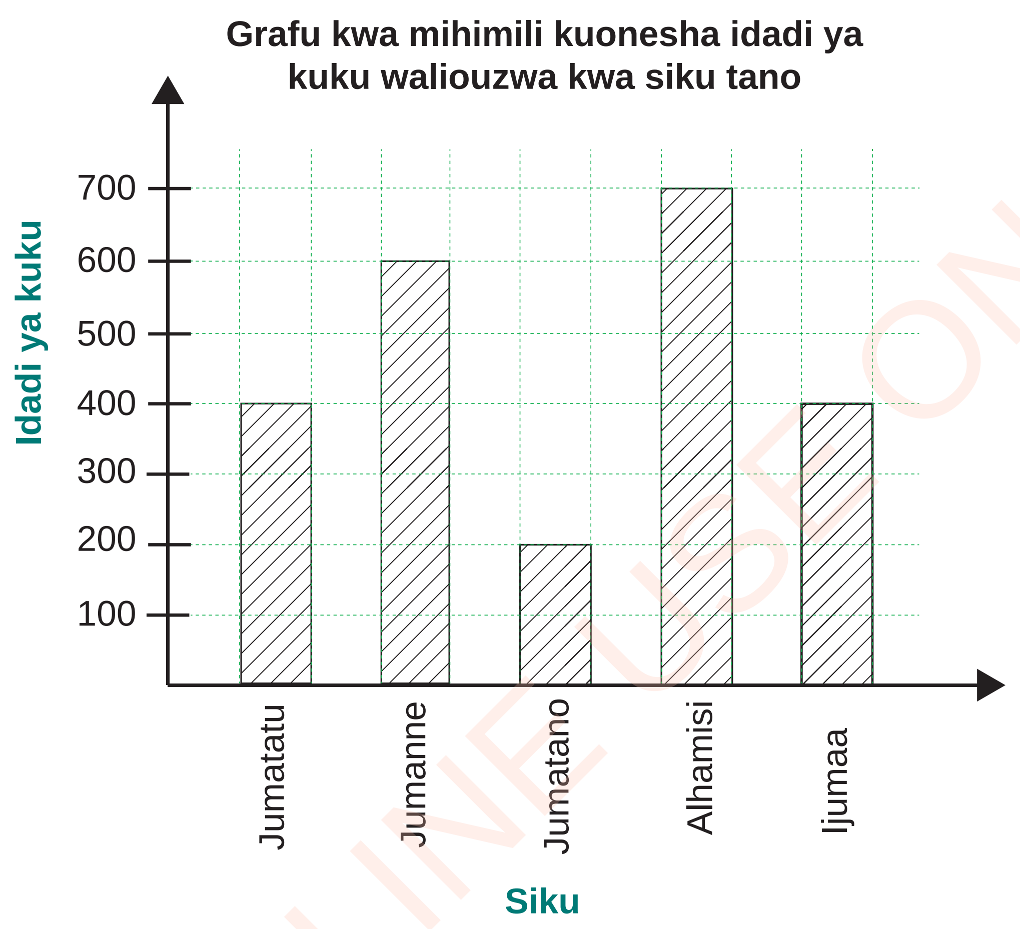

Maswali

(a) Siku gani waliuzwa kuku wachache zaidi? Waliuzwa kuku wangapi siku hiyo?

(b) Siku gani waliuzwa kuku wengi zaidi? Waliuzwa kuku wangapi siku hiyo?

(c) Siku zipi waliuzwa kuku kwa idadi sawa? Je, walikuwa kuku wangapi kwa siku mojawapo?

(d) Kuku wangapi waliuzwa siku ya Jumanne?

(e) Siku ya Jumanne waliuzwa kuku wangapi zaidi ya waliouzwa Jumatatu?

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Njia

(a) Ukilinganisha mihimili, mhimili mfupi zaidi unaonesha siku ya Jumatano waliuzwa kuku wachache zaidi. Waliuzwa kuku 200.

(b) Ukilinganisha mihimili, mhimili mrefu zaidi unaonesha siku ya Alhamisi waliuzwa kuku wengi zaidi. Waliuzwa kuku 700.

(c) Ukilinganisha mihimili, mihimili inayolingana inaonesha kuwa siku ya Jumatatu na Ijumaa, kuku waliuzwa kwa idadi sawa. Waliuzwa kuku 400.

(d) Ukilinganisha mihimili, mhimili wa siku ya Jumanne utaona kuwa waliuzwa kuku 600.

(e) Tafuta tofauti ya kuku waliouzwa siku ya Jumanne na siku ya Jumatatu. Jumanne waliuzwa kuku 600 na Jumatatu waliuzwa kuku 400. Tofauti ni; 600 – 400 = 200.

Kwa hiyo, siku ya Jumanne waliuzwa kuku 200 zaidi ya siku ya Jumatatu.

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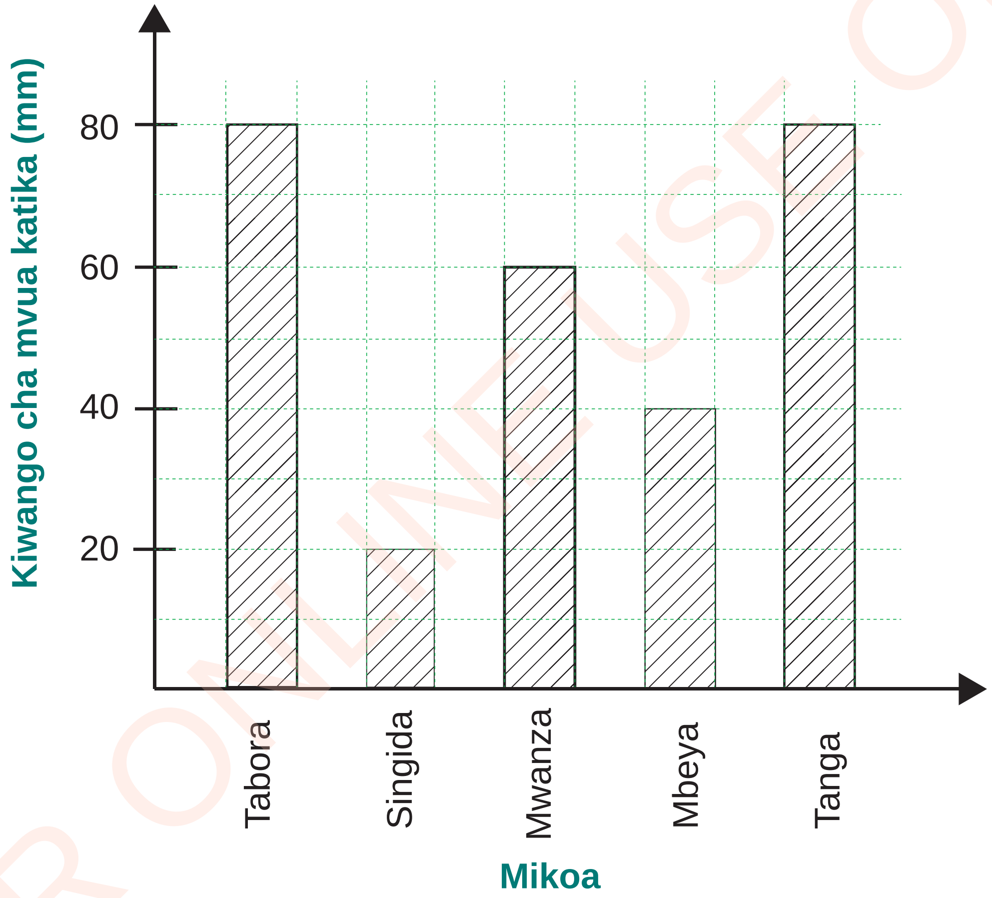
Mfano wa 2

Mvua ilinyesha kwa siku moja katika mikoa mitano kwa kiwango tofauti kama inavyoonesha katika grafu ifuatayo:

Grafu kwa mihimili kuonesha kiwango cha mvua iliyonyesha katika mikoa mitano



Maswali

(a) Mikoa ipi mvua ilinyesha kwa kiwango kinacholingana? Kiasi cha mvua kilikuwa milimeta ngapi?

(b) Mkoa gani ulikuwa na mvua kidogo kwa siku hiyo? Kwa kiasi gani?

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(c) Tafuta tofauti ya kiasi cha mvua iliyonyesha Mwanza na Mbeya.

(d) Tafuta jumla ya kiasi cha mvua iliyonyesha siku hiyo kwa mikoa yote mitano.

Njia

(a) Ukilinganisha mihimili, mihimili inayolingana urefu inaonesha kuwa na kiasi sawa cha mvua. Mikoa ya Tabora na Tanga ilipata kiasi kinachofanana cha mvua ambacho ni milimeta 80.

(b) Ukilinganisha mihimili, mhimili mfupi zaidi unaonesha mvua chache. Mkoa uliokuwa na mvua chache ni Mkoa wa Singida uliokuwa na milimeta 20.

(c) Ukilinganisha mihimili, utaona kuwa tofauti ya mvua iliyonyesha Mwanza na Mbeya ni:
Mwanza (60 mm) – Mbeya (40 mm) = mm 20.

(d) Jumla ya kiasi cha mvua iliyonyesha inapatikana kwa kujumlisha milimeta za mvua katika mikoa yote.

Jumla = mm 80 + mm 20 + mm 60 + mm 40 + mm 80
= mm 280.

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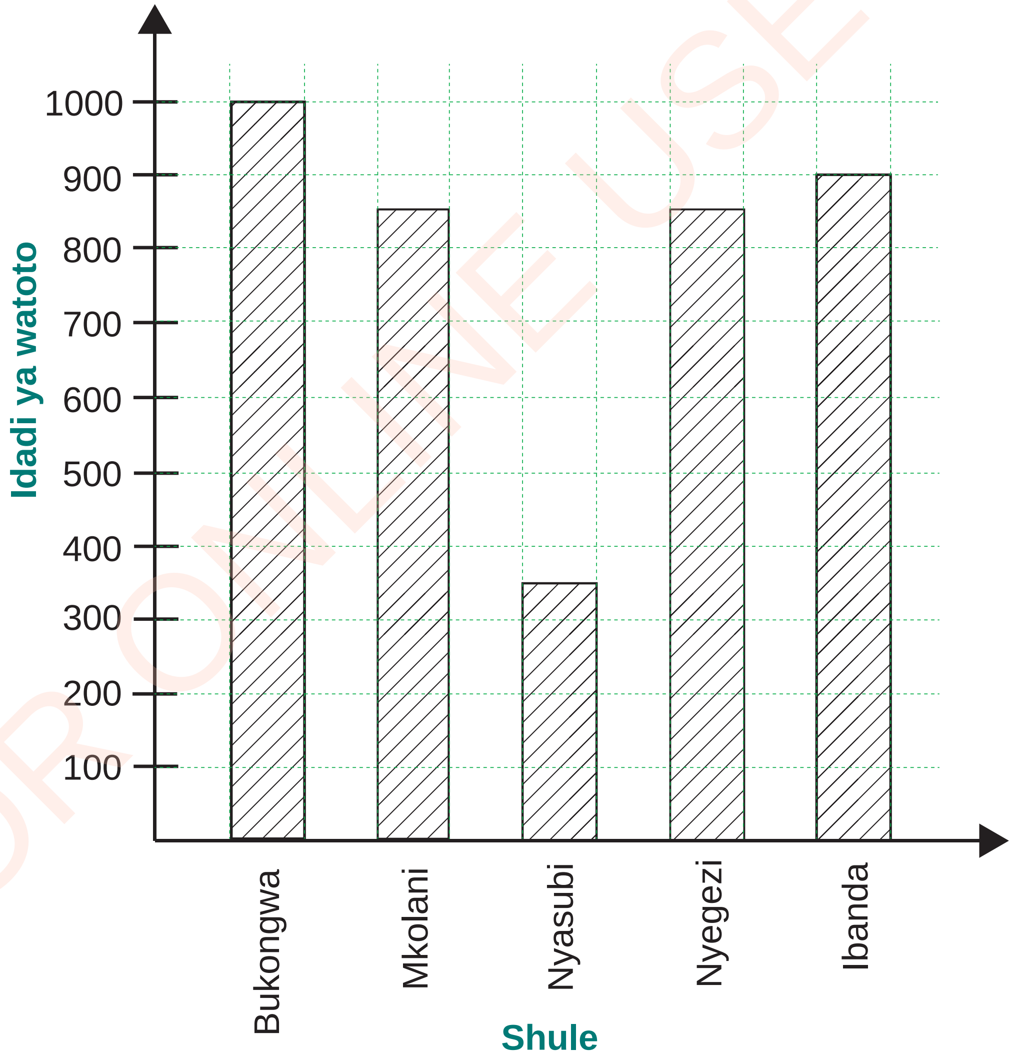
Zoezi la 3

Jibu maswali yafuatayo:

1. Tumia grafu ifuatayo kujibu maswali.

Idadi ya watoto walioandikishwa kuingia darasa la kwanza katika shule za msingi za Bukongwa, Mkolani, Nyasubi, Nyegezi na Ibanda imewasilishwa kwa grafu ifuatayo:

Grafu kwa mihimili kuonesha idadi ya watoto waliondikishwa katika shule tano



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Maswali

(a) Shule ipi iliandikisha watoto wengi zaidi na walikuwa wangapi?
(b) Shule zipi ziliandikisha idadi sawa ya watoto?
(c) Tafuta tofauti ya idadi ya watoto walioandikishwa kati ya Shule ya Msingi Bukongwa na Shule ya Msingi Ibanda.
(d) Watoto wangapi waliandikishwa katika shule zote?

2. Takwimu kwa picha inaonesha mananasi yaliyovunwa na Baraka katika shamba lake kwa siku saba mfululizo.

Kipimio: Picha 1 ya nanasi inawakilisha mananasi 100

Siku	Idadi ya mananasi
Jumamosi	
Jumapili	
Jumatatu	
Jumanne	
Jumatano	
Alhamisi	
Ijumaa	

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Maswali

(a) Chora grafu kwa mihimili ikionesha taarifa hiyo.

Kipimio: sm1 inawakilisha mananasi 100 kwa wima

sm1 inawakilisha upana wa mhimili

(b) Ni siku gani yalivunwa mananasi mengi zaidi? Yalivunwa mananasi mangapi?

(c) Siku zipi idadi sawa ya mananasi ilivunwa? Yalivunwa mananasi mangapi kwa siku mojawapo?

(d) Tafuta wastani wa mananasi yaliyovunwa kuanzia siku ya Jumapili hadi Ijumaa.

3. Tumia jedwali lifuatalo linaloonesha idadi ya wagonjwa wa Malaria waliohudhuria katika Kituo cha Afya Mgori kujibu maswali yanayofuata.

Mwezi	Idadi ya wagonjwa wa Malaria
Januari	160
Februari	180
Machi	120
Aprili	200
Mei	200
Juni	100

(a) Chora grafu mihimili kuwasilisha taarifa hiyo.

Kipimio: sm1 inawakilisha wagonjwa 20 kwa wima

sm1 inawakilisha upana wa mhimili

(b) Mwezi upi ulikuwa na wagonjwa wengi zaidi? Andika idadi ya wagonjwa.

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(c) Tafuta wastani wa wagonjwa waliohudhuria katika kituo cha afya kati ya Januari na Juni.

(d) Mwezi Juni walipungua wagonjwa wangapi kufikia wastani?

4. Msunga alinunua ndizi kwa wiki tano kama inavyoonekana katika jedwali.

Wiki	wiki ya 1	wiki ya 2	wiki ya 3	wiki ya 4	wiki ya 5
Idadi ya Ndizi	350	250	450	350	150

Maswali

(a) Chora grafu kwa mihimili kuwasilisha takwimu hizo.

Kipimo: sm1 inawakilisha ndizi 50 kwa wima
sm1 inawakilisha upana wa mhimili

(b) Ni wiki zipi Msunga alinunua idadi sawa ya ndizi?

(c) Tafuta tofauti ya idadi ya ndizi zilizonunuliwa kati ya wiki ya tatu na ya tano.

(d) Tafuta wastani wa idadi ya ndizi zilizonunuliwa kwa wiki.

(e) Wiki ya pili alinunua ndizi ngapi?

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Zoezi la 4

Jibu maswali yafuatayo:

1. Tafuta wastani wa vipimo vifuatavyo:
   (a) km 20, km 80, km 40 na km 60.
   (b) lita 35, lita 50, lita 45 na lita 30.
2. Anna alipata alama 45 kwenye somo la Sayansi, alama 50 kwenye somo la Hisabati na alama 55 kwenye somo la Kiswahili. Anna alikuwa na wastani wa alama ngapi katika masomo haya?
3. Umri wa Paulo ni miaka 11, umri wa Juma ni miaka 9, na umri wa Aisha ni miaka 7. Tafuta wastani wa umri wao.
4. Uzito wa watu 6 katika kilogramu ni kama ifuatavyo: kg 80, kg 70, kg 65, kg 90, kg 55 na kg 60. Tafuta wastani wa uzito wao katika kilogramu.
5. Mahindi yenye kilogramu zifuatazo yalijazwa katika magunia matano kama ifuatavyo: kg 100, kg 90, kg 110, kg 95 na kg 105. Kwa wastani kila gunia lilikuwa na kilogramu ngapi?
6. Mzee Jombwe aliuza maziwa kwa siku saba kama ifuatavyo: lita 46, lita 41, lita 40, lita 50, lita 58, lita 60 na lita 34. Tafuta wastani wa lita za maziwa zilizouzwa kwa siku.
7. Mkulima aliangua nazi kama ifuatavyo: nazi 10, nazi 15, nazi 5, nazi 7, nazi 3, nazi 4, nazi 4 na nazi 24. Kwa wastani mkulima aliangua nazi ngapi?
8. Grafu kwa mihimili ifuatayo inaonesha kilogramu za maharage zilizotumika kwa chakula cha wanafunzi kwa siku saba.

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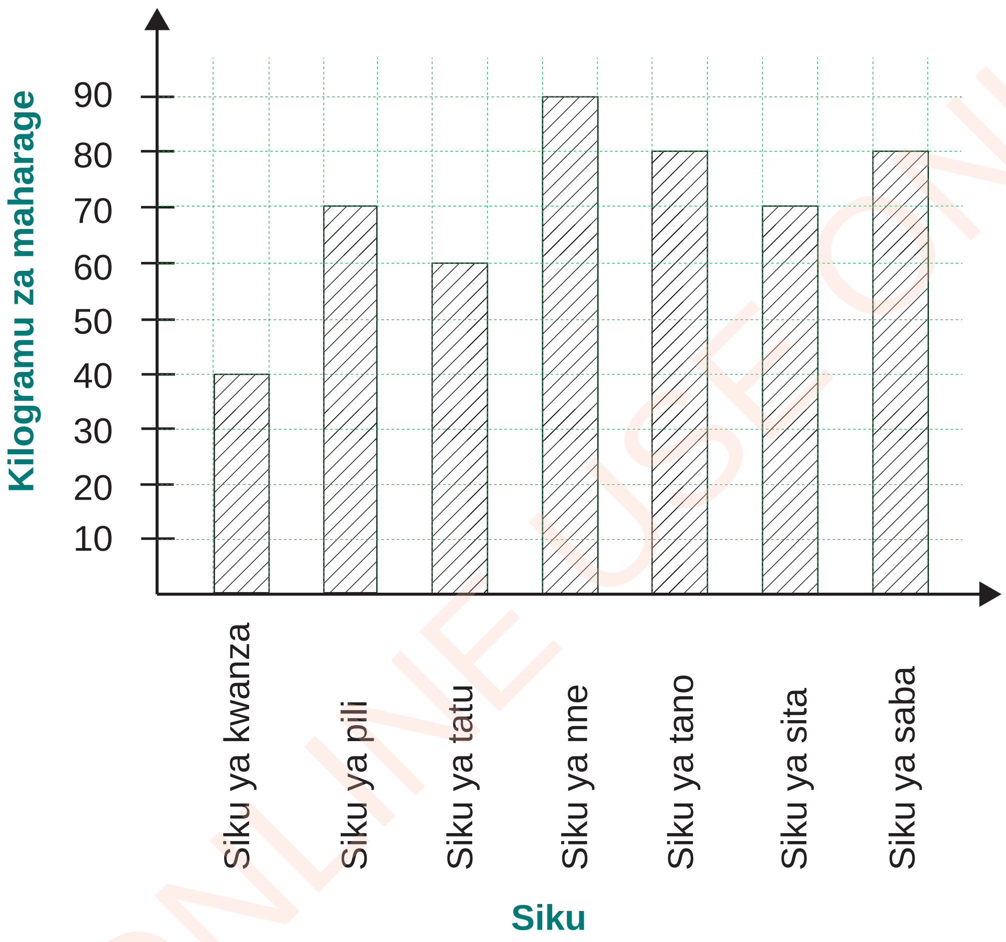
Grafu kwa mihimili kuonesha kilogramu za maharage zilizotumiwa na wanafunzi kwa siku saba



(a) Siku gani zilitumika kilogramu nyingi zaidi za maharage?

(b) Siku zipi matumizi ya kilogramu za maharage yalilingana?

(c) Tafuta jumla ya kilogramu za maharage zilizotumika kwa siku zote saba.

(d) Kwa wastani, kilogramu ngapi za maharage zilitumika kwa siku?

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9. Idadi ya ng'ombe waliouzwa katika mnada wa Songambele kwa wiki 6 ilikuwa kama ifuatavyo:

Wiki	wiki ya kwanza	wiki ya pili	wiki ya tatu	wiki ya nne	wiki ya tano	wiki ya sita
Idadi ya ng'ombe	90	40	20	25	50	75

(a) Wiki gani waliuzwa ng'ombe wachache zaidi?

(b) Jumla ya ng'ombe wangapi waliuzwa kwa wiki zote sita?

(c) Wiki ipi waliuzwa ng'ombe wengi zaidi?

(d) Tafuta wastani wa ng'ombe wote waliouzwa.

10. Kituo cha afya kilinakili idadi ya watu waliokwenda kupima macho kama ifuatavyo:

Siku	Jumatatu	Jumanne	Jumatano	Alhamisi	Ijumaa	Jumamosi
Idadi ya watu	450	310	340	520	424	356

Tafuta wastani wa idadi ya watu waliopima macho kwa siku katika kituo hicho cha afya.

Jikumbushe

1. Grafu kwa mihimili hutumika kuwasilisha taarifa.
2. Grafu kwa mihimili inaweza kuwasilishwa kwa wima au kwa ulalo.
3. $\text{Wastani} = \frac{\text{Jumla}}{\text{Idadi}}$
4. Uchaguzi wa kipimio utategemea ukubwa wa taarifa uliyopewa.

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