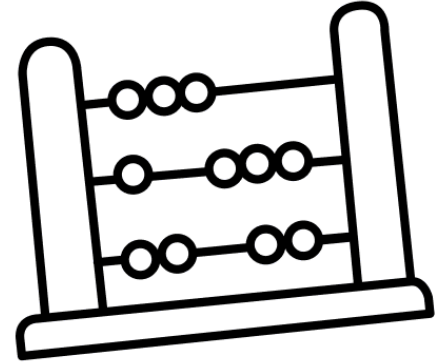


**Qorista tirooyinka yaryar ee qaabka caadiga ah
(standard form)**



Maths

Cutub: Qaabka caadiga ah (standard form)

Natiijo

Waxaan qori karaa tirooyin aad u yar oo ah $A \times 10^n$ (halkaas oo $1 \leq A < 10$) waxaanan qiimeeyaa macnaha nolosha dhabta ah ee qaabkan faa'iidada laga helo.

Erayada muhiimka ah

Marka tiro lagu dhufto nafteeda marar badan, waxaa loo qori karaa si fudud qaab jibbaar ah (exponential form).

$$\text{e.g. } 2 \times 2 \times 2 = 2^3$$

Sharciga isku-xirka (associative law) wuxuu sheegayaa in ku celcelinta hawlgalku ay soo saarto natiijo isku mid ah iyadoo aan loo eegin sida lammaaneyaasha qiimaha (values) loo kooxeeyo. Waxaan ku kooxayn karnaa anagoo adeegsanayna xero (brackets).

Tusaalooyin
(Examples)

$$2.4 \times 100 = 2.4 \times 10 \times 10$$

$$3 + (4 + 10) = (3 + 4) + 10$$

Tusaale ma aha (Non examples)

$$(48 \div 6) \div 2 = 4$$

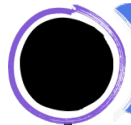
$$48 \div (6 \div 2) = 16$$

Erayada muhiimka ah

Qaabka caadiga ah (standard form) waa marka tiro loo qoro qaab $A \times 10^n$, (halkaas oo $1 \leq A < 10$ iyo n waa tiro dhammaystiran (integer)).

Qaabka casharka

Qorista tirooyinka yaryar ee qaabka caadiga ah (standard form)



Qorista tirooyinka aad u yaryar ee qaabka caadiga ah (standard form)



U beddelka qaabka caadiga ah (ordinary) iyo qaabka caadiga ah (standard form)



Qaabka caadiga ah (standard form) ee xisaabiyaha (calculator)

Qorista tirooyinka aad u yaryar ee qaabka caadiga ah (standard form)

Jajab tobanle (decimal) ayaa loo qoray dhammaan qaababkan.

$$2.1 \times 0.01$$

$$21 \times \frac{1}{1000}$$

$$2.1 \times 10^{-2}$$

$$2100 \times 0.00001$$

Ma ogaan kartaa waa maxay jajabka tobanle (decimal)?

Waa 0.021

Waxaa jira tiro aan dhamaad lahayn oo habab ah oo loo qoro 0.021, laakiin kaliya hal hab oo qaabka caadiga ah (standard form) ah.

Isticmaalka hab caadi ah si loo qoro tirooyin aad u yaryar waa muhiim.

Isticmaalka qaabka caadiga ah (standard form) ee tirooyinka waaweyn ama yaryar waa heshiis (convention).

$$2.1 \times 10^{-2}$$



Tani waa sababta oo ah ma dooneyno in tiro loo qoro siyaabo kala duwan oo badan, maxaa yeelay tani waxay noqon kartaa mid jahawareer leh.

Isticmaalka qaabka caadiga ah (standard form) ee tirooyinka waaweyn ama yaryar waa heshiis (convention).

$A \times 10^n$ halkaas oo $1 \leq A < 10$, n -na yahay tiro (integer).

A waa inay tahay tiro u dhaxaysa 1 iyo 10, oo ay ku jirto 1, laakiin 10 kuma jiro.

n wuxuu noqon karaa tiro (whole number) togan ama taban.

Qorista tirooyin aad u yar oo qaabka caadiga ah (standard form)

Isticmaalka jaantuska qiimaha meesha (place value chart) waa hab fiican oo lagu sawiro tirada oo loo beddelo qaabka caadiga ah (standard form), laakiin wuxuu qaataa waqti.

O	t	h	th	tth	hth	m	tm	hm	b
10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}
0	● 0	0	0	0	6	1	9		

Qorista tirooyin aad u yar oo qaabka caadiga ah (standard form)

Isticmaalka jaantuska qiimaha meesha (place value chart), maxay tahay fikraddaada tiradan qaabkeeda caadiga ah (standard form)?

$$6.19 \times 10^{-5}$$

O	t	h	th	tth	hth	m	tm	hm	b
10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}
0	● 0	0	0	0	6	1	9		

Aynu eegno haddii aan heli karno hab aan jaantuska qiimaha meesha (place value chart) la'aan.

Qorista tirooyinka aad u yar ee qaabka caadiga ah (standard form)

Jaantuska qiimaha meesha (place value chart) la'aan, sidee ku u qornaa qaabka caadiga ah (standard form)?

Marka hore, adigoo isticmaalaya lambarrada 6, 1 iyo 9, waxaan samaynaynaa tiro si loo buuxiyo

$$1 \leq A < 10$$

Marka waxaan ognahay in qaabka caadiga ah (standard form) uu ekaado sidan ilaa hadda

$$6.19 \times 10^{\text{■}}$$

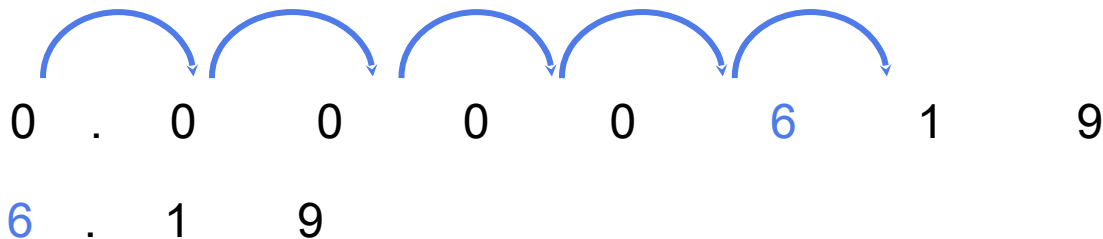
0 . 0 0 0 0 6 1 9

Qorista tirooyinka aad u yar ee qaabka caadiga ah (standard form)

Hadda, waxaan tirinay inta jeer ee isku dhufashada aan u isticmaalno si aan uga helno 6.19 ilaa 0.000 061 9

Tani waxay ka dhigan tahay $6.19 \times 10^{-5} = 0.000\ 061\ 9$

Qaabka caadiga ah (standard form) $6.19 \times 10^{-5} = 0.000\ 061\ 9$



Layla waxay tidhaahdaa waxay taqaan wado gaaban.



Layla

Tirooyinka yar, jibbaarka (exponent) taban (negative) wuxuu kuu sheegayaa inay yar tahay, tirada jibbaarkuna waxay kuu sheegaysaa inta eber (zero) ee la dhigo.

Waan arkayaa sidaas darteed 1.24×10^{-3} wuxuu leeyahay jibbaar (exponent) taban (negative), marka waan ogahay inay yar tahay. Tirada jibbaarka (exponent) waa 3 marka waxaa jira 3 eber (zero).

0.00124



Suad

Ma sharxi kartaa sababta wadada gaaban ee Layla u shaqeyso tirooyinka yar?

Marka tiro si sax ah loogu qoro qaabka caadiga ah (standard form), jibbaarka (exponent) taban (negative) waa tirada qaybinta (divisions) ee 10.

Qorista tirooyinka aad u yar ee qaabka caadiga ah (standard form)

U beddel kuwan tiro caadi ah:

a) 1.82×10^{-4}

b) 9.6×10^{-2}

c) 5.15×10^{-7}

d) 1.035×10^{-3}

e) 6.0045×10^{-10}

1) Adigoo isticmaalaya jaantusyada qiimaha meesha (place value), ku qor kuwan qaabka caadiga ah (standard form).

a)

O	t	h	th	tth	hth
10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	0	0	0	6	9

b)

O	t	h	th	tth	hth
10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	0	1	2	8	

2) Kuwa soo socda midkee aan qaabka caadiga ah (standard form) ku jirin? Sharax sababta.

a) 123×10^{-9}

b) 1.24×10^{-3}

c) 0.96×10^{-1}

d) $12\,300 \div 10^{10}$

e) 0.059×10^8

3) Adigoon isticmaalin jaantuska qiimaha meesha (place value chart), kuwan soo socda u qor qaabka caadiga ah (standard form).

- a) 0.000 000 354
- b) 0.001 45
- c) 0.000 000 000 563
- d) 0.048 6
- e) 0.000 000 000 631

- 1) Adigoo isticmaalaya jaantusyada qiimaha meesha (place value charts), kuwan soo socda u qor qaabka caadiga ah (standard form).

a)

O	t	h	th	tth	hth
10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	0	0	0	6	9

$$6.9 \times 10^{-4}$$

b)

O	t	h	th	tth	hth
10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	0	1	2	8	

$$1.28 \times 10^{-2}$$

2) Kuwa soo socda midkee aan qaabka caadiga ah (standard form) ku jirin? Sharax sababta.

a) 123×10^{-9}

Kani waa qalad sababtoo ah 123 waa inuu noqdaa tiro qancisa $1 \leq A < 10$

b) 1.24×10^{-3}

c) 0.96×10^{-1}

Kani waa qaabka caadiga ah (standard form) ee saxda ah.

d) $12\,300 \div 10^{10}$

Kani waa qalad sababtoo ah 0.96 waa inuu noqdaa tiro qancisa $1 \leq A < 10$

e) 0.059×10^8

Kani waa qalad sababtoo ah qaabka caadiga ah (standard form) wuxuu isticmaalaa isku dhufasho (multiplication).

Kani waa qalad sababtoo ah 0.059 waa inuu noqdaa tiro qancisa $1 \leq A < 10$

3) Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor kuwan qaabka caadiga ah (standard form).

a) 0.000 000 354 $= 3.54 \times 10^{-7}$

b) 0.001 45 $= 1.45 \times 10^{-3}$

c) 0.000 000 000 563

d) 0.048 6 $= 5.63 \times 10^{-10}$

e) 0.000 000 000 631
 $= 4.86 \times 10^{-2}$

$= 6.31 \times 10^{-10}$

Qaabka casharka

Qorista tirooyinka yar qaabka caadiga ah (standard form)



Qorista tirooyinka aad u yar qaabka caadiga ah (standard form)



Beddelka u dhexeeya qaabka caadiga ah iyo qaabka caadiga ah (standard form)

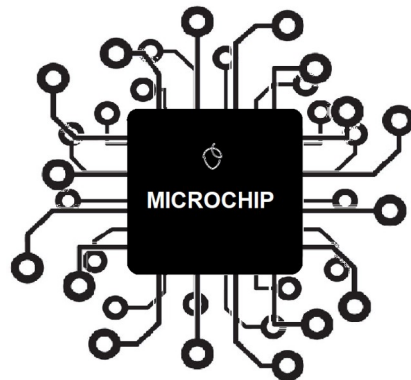


Qaabka caadiga ah (standard form) ee xisaabiyaha (calculator)

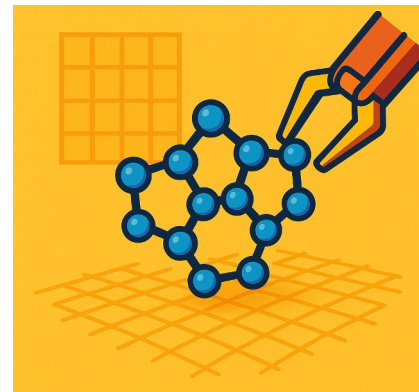
Bixi tusaalooyin nolol dhab ah oo aan u isticmaalno tirooyin aad u yar.



Bayoloji (Biology) ama mikrobiyoloji (microbiology) – fiirinta noolaha, unugyada (cells) iwm.



Microchips-ku waxay qayb ka yihiin qalab kasta oo elektaroonik ah oo adduunka oo dhan ah



Beddelka u dhexeeya qaabka caadiga ah iyo qaabka caadiga ah (standard form)

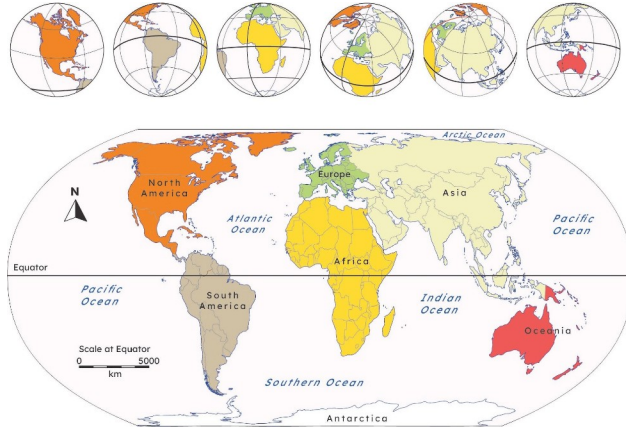


Sharaxaad

Bixi tusaalooyin nolol dhab ah oo aan u isticmaalno tirooyin aad u waaweyn.



Astronomy halkaas oo loo baahan yahay cabbiro aad u weyn



Tirooyinka caalamiga ah tusaale ahaan dadka, masaafada, lacagaha



Dhismaha iyo injineernimada (engineering)

Beddelka u dhexeeya qaabka caadiga ah iyo qaabka caadiga ah (standard form)



Qaar ka mid ah ardaydu waxay xaliyeen su'aalahan. Sheeg inay sax yihiin iyo in kale oo sharax sababta.

780 000 qaabka caadiga ah (standard form).

780 000
7.8

Waxaa jiray 5 isku dhufasho oo 10 ah oo ka yimid tiirka kow (ones column).

92 300 qaabka caadiga ah (standard form).

92 300
92.3

Waxaa jiray 3 isku dhufasho oo 10 ah oo ka yimid tiirka kow (ones column).

Jawaabaha:

$$7.8 \times 10^5$$

$$92.3 \times 10^3$$

U beddelidda qaabka caadiga ah iyo qaabka jaantuska (standard form)

Qaar ka mid ah ardaydu waxay xaliyeen su'aalahan. Sheeg inay sax yihiin iyo in kale oo sharax sababta.

780 000 oo ku jira qaabka jaantuska (standard form).

780 000
7.8

Waxaa jiray 5 isku dhufasho oo 10 ah oo laga soo bilaabo tiirka kow (ones column).

$$7.8 \times 10^5$$

Tani waa sax.

Waxay abuureen tiro 7.8 iyagoo isticmaalaya lambarrada 7 iyo 8 kuwaas oo qanciya $1 \leq A < 10$.

Waxay si sax ah u tiriyeen tirada isku dhufashada 10 si ay 7.8 uga dhigmaan 780 000

Ardayda qaar ayaa xisaabiyay jawaabaha su'aalahan. Gee inay sax yihiin iyo in kale oo sharax sababta.

Tani waa qalad.

Waxay abuureen tiro 92.3 iyagoo isticmaalaya lambarrada 9, 2 iyo 3 kuwaas oo aan qancin $1 \leq A < 10$.

Waxay tiriyeen tirada isku dhufashada 10 si ay 92.3 uga dhigmaan 92 300

92 300 oo ku jira qaabka jaantuska (standard form).

92 300
92.3

Waxaa jiray 3 isku dhufasho oo 10 ah oo laga soo bilaabo tiirka kow (ones column).

$$92.3 \times 10^3$$

1) U beddel kuwan soo socda qaabka jaantuska (standard form).

a) 0.000 000 263

b) 652 000 000

c) 0.005 63

d) 892 000 000 000

e) 0.000 000 000 000 000 3

f) 30 004 000

g) 0.000 300 4

2) U beddel kuwan soo socda tirooyinka caadiga ah (ordinary numbers).

a) 2.31×10^4

b) 6.153×10^{-5}

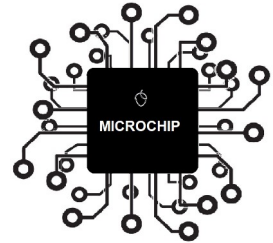
c) 9.1565×10^{-6}

d) 2.48×10^5

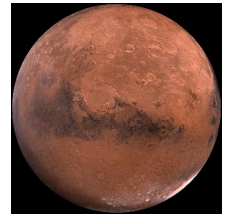
e) 2.48×10^{-5}

f) 3.0065×10^{-9}

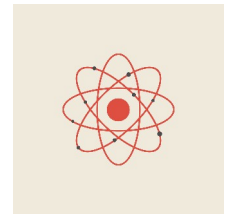
3) Microchip-ku wuxuu leeyahay ballac dhan 2×10^{-6} m. Ku qor tiro caadi ah (ordinary number) oo ku jirta cm.



4) Mars waxay u jirtaa Dhulka qiyaastii 225 milyan km. Ku qor qaabka jaantuska (standard form) oo ku jirta m.



5) Gacan-wareega (radius) atamka waa qiyaastii 1×10^{-10} m. Ku qor tiro caadi ah (ordinary number) oo ku jirta mm.



1) U beddel kuwan soo socda qaabka caadiga ah (standard form):

a) 0.000 000 263 $= 2.63 \times 10^{-7}$

b) 652 000 000 $= 6.52 \times 10^8$

c) 0.005 63 $= 5.63 \times 10^{-3}$

d) 892 000 000 000 $= 8.92 \times 10^{11}$

e) 0.000 000 000 000 000 000 3

f) 30 004 000 $= 3 \times 10^{-16}$

g) 0.000 300 4 $= 3.000\ 4 \times 10^7$

$= 3.004 \times 10^{-4}$

2) U beddel kuwan soo socda tiro caadi ah:

a) 2.31×10^4

b) 6.153×10^{-5}

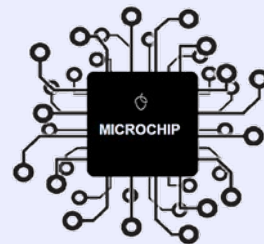
c) 9.1565×10^{-6}

d) 2.48×10^5

e) 2.48×10^{-5}

f) 3.0065×10^{-9}

3) Microchip (microchip) wuxuu leeyahay ballaciisa 2×10^{-6} m. Ku qor tiro caadi ah oo cm ah.

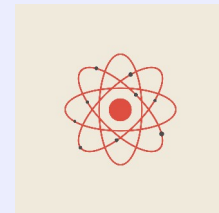


4) Mars (Mars) waxay u jirtaa dhulka qiyaastii 225 milyan km. Ku qor qaabka caadiga ah (standard form) oo m ah.



$$225\,000\,000\text{ km} = 225\,000\,000\,000\text{ m} = 2.25 \times 10^{11}\text{ m}$$

5) Gacan-dhexe (radius) atamka (atom) wuxuu qiyaas ahaan yahay 1×10^{-10} m. Ku qor tiro caadi ah oo mm ah.



$$0.000\,000\,000\,1\text{ m} = 0.000\,000\,000\,000\,1\text{ mm}$$

Qaabka casharka

Qorista tirooyinka yar ee qaabka caadiga ah (standard form)



Qorista tirooyinka aad u yar ee qaabka caadiga ah (standard form)

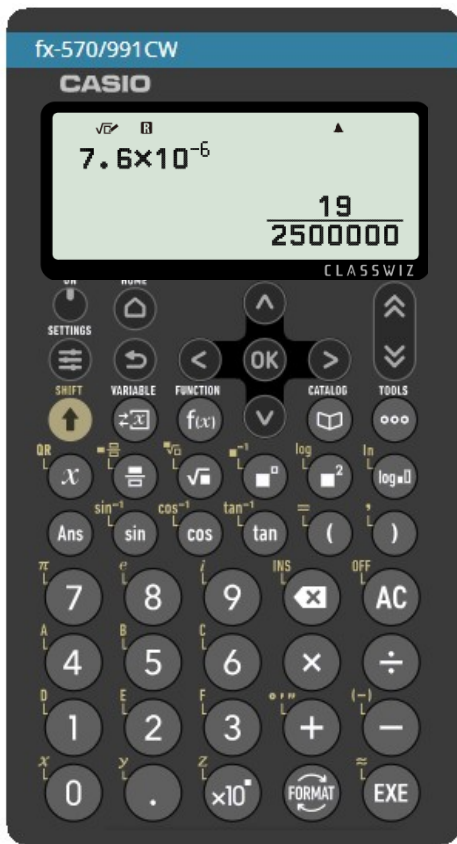


Beddelka qaabka caadiga ah iyo qaabka caadiga ah (standard form)



Qaabka caadiga ah (standard form) ee kalkuulatar (calculator)

Qaabka caadiga ah (standard form) ee kalkuulatar (calculator)



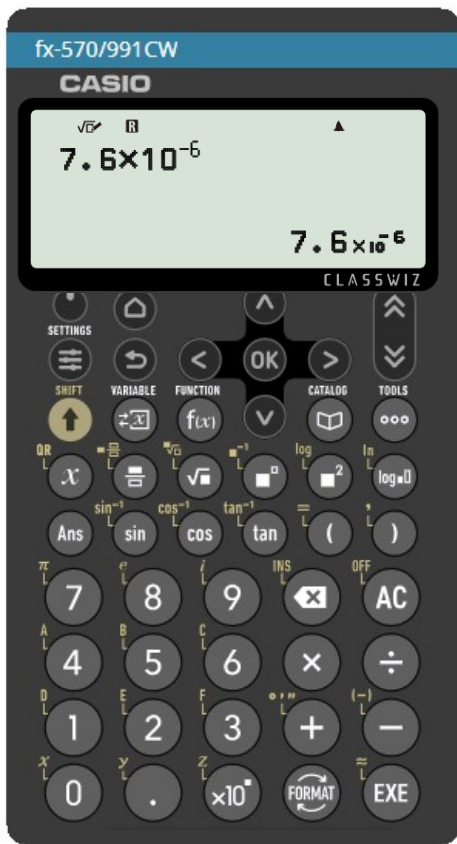
Aan isku dayno beddelka 7.6×10^{-6} oo tiro caadi ah

Isticmaal  a (input)



Riixida :  

Dooro  beddel jaaɓ toɓanle (decimal)
Maxaa dhacaya?



Ma beddeli doono jajab tobanle (decimal).

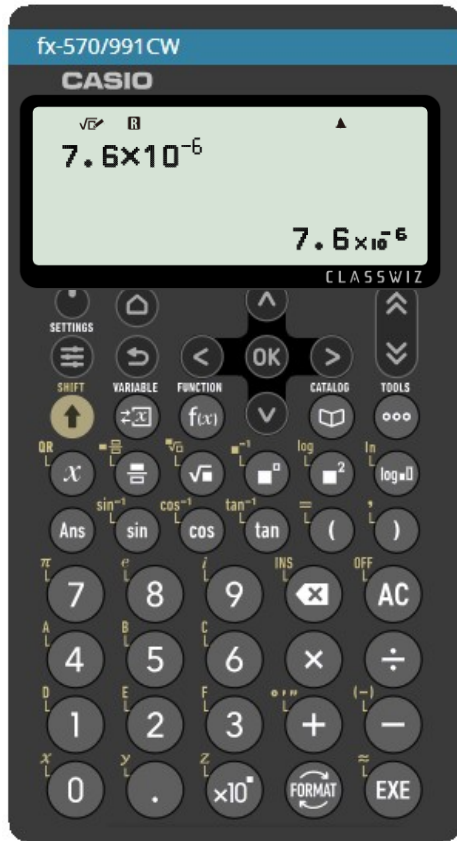
Waxay jawaabta ku hayaa qaabka caadiga ah (standard form) sababtoo ah jawaabtu aad bay u yar tahay.

Sidaa darteed waxaa muhiim ah inaad awood u leedahay inaad u beddesho qaabka caadiga ah (standard form) tiro caadi ah (ordinary number).

Waa maxay tan marka loo eego tiro caadi ah (ordinary number)?

0.000 007 6

Qaabka caadiga ah (standard form) ee xisaabiyaha (calculator)



Waxaad sidoo kale isticmaali ka $\times 10^{\square}$ hanka

Isticmaalka gelinta (input)



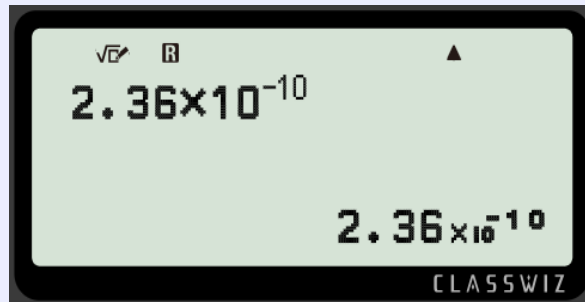
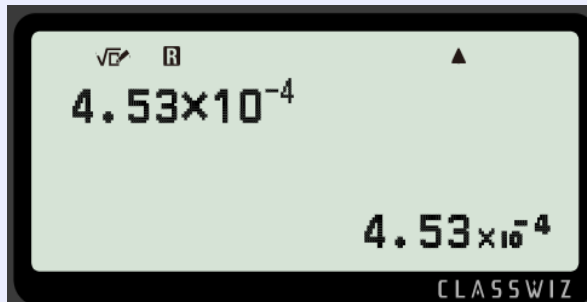
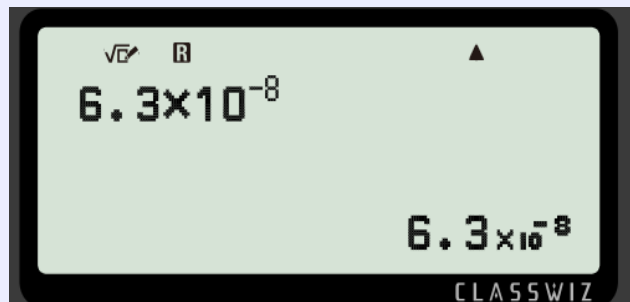
Riixida a **OK** **EXE**

Dejinta oo u beddel to **DEC** (decimal)

Soo-saar **FORMAT** (put) wuxuu noqon doonaa mid la mid ah

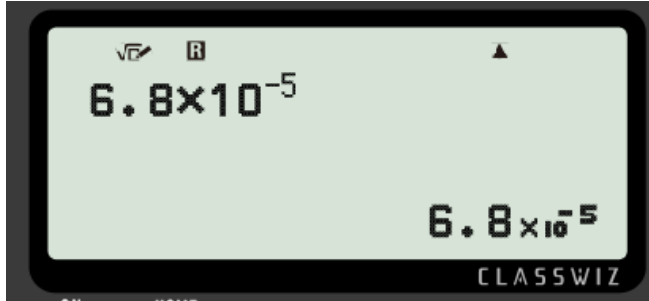
Qaabka caadiga ah (standard form) ee xisaabiyaha (calculator)

Ku qor kuwan soo socda qaab tobanle (decimal).

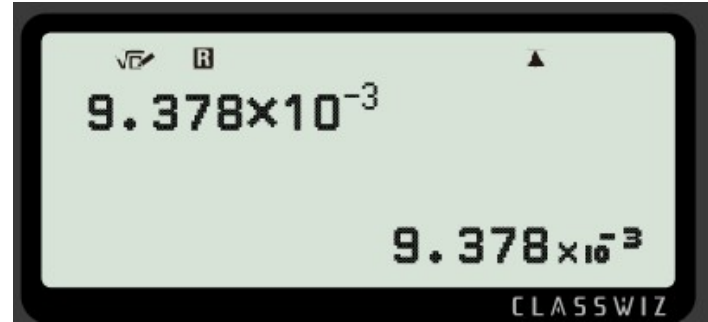


1) Ku qor soo-saarka (output) qaab tobanle (decimal).

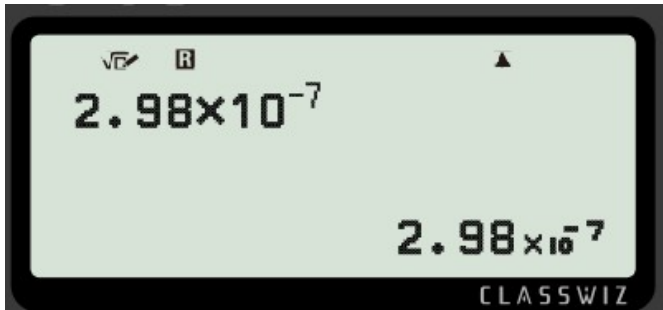
a)



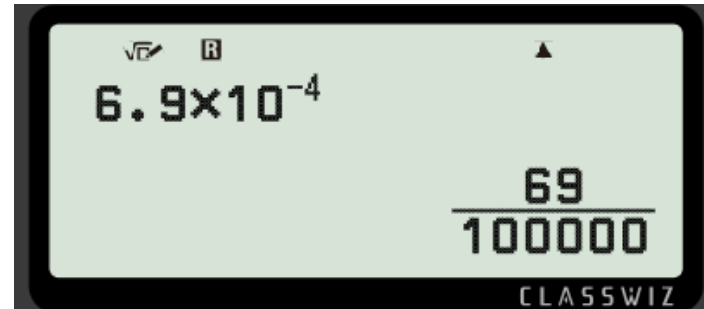
c)



b)



d)



2) Baadh goorta tirada noqoto mid aad u yar oo xisaabiyuhu (calculator) u beddelo qaabka caadiga ah (standard form).

3) Buuxi macluumaadka maqan.

a)



c)



b)



d)



1) Ku qor soo-saarka (output) qaab tobanle (decimal).

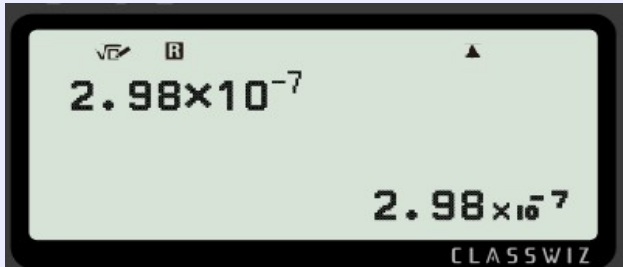
a)



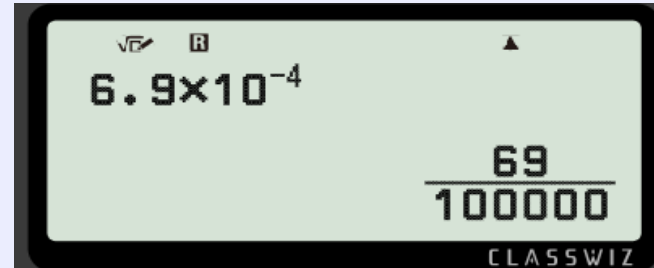
c)



b)



d)



2) Baadh goorta tirada noqoto mid aad u yar oo xisaabiyuhu (calculator) u beddelo qaabka caadiga ah (standard form).

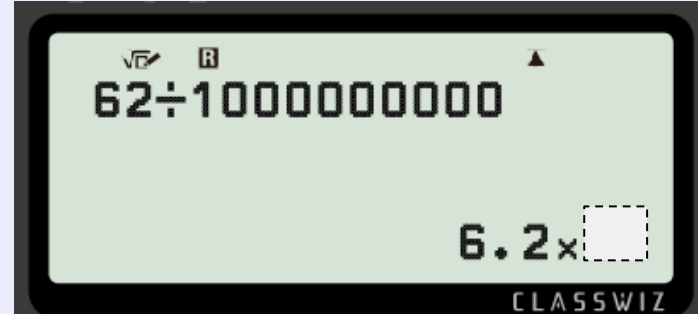
Tiro kasta oo loo qoro qaabka caadiga ah (standard form) wuxuu leeyahay jibbaar (exponent) ka yar ama la eg -3

3) Buuxi macluumaadka maqan.

a)



c)



b)



d)



Waa cad in loo baahan yahay qaabka caadiga ah (standard form) nolosha dhabta ah, marka waa muhiim in tirooyinka aad u waaweyn ama aad u yaryar lagu qoro qaabka caadiga ah (standard form) iyo lidkeeda.

$A \times 10^n$ halkaas oo $1 \leq A < 10$ iyo n uu yahay tiro dhammaystiran (integer).



A waa inuu ahaadaa tiro u dhaxaysa 1 iyo 10, oo ay ku jirto 1 lamana aha 10



n wuxuu noqon karaa tiro dhammaystiran (integer) togan ama taban.

Marka jibbaarku (exponent), n , uu yahay togan, tirada guud waa weyn tahay.
Marka jibbaarku (exponent), n , uu yahay taban, tirada guud waa yar tahay.