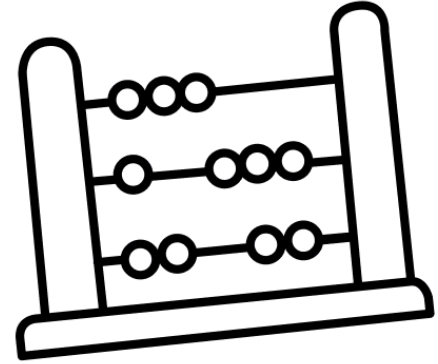


Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



Maths

Cutub: Qaabka caadiga ah (standard form)

Natiijo

Waxaan qori karaa tirooyin aad u waaweyn oo qaab caadi ah (standard form) waxaanan qiimeeyaa macnaha nolosha dhabta ah ee qaabkan si fiican loogu isticmaalo.

Erayada muhiimka ah

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

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

Sharciga isku-xirnaanta (associative law) wuxuu sheegayaa in ku celcelinta hawlgalku ay soo saarto natiijo isku mid ah si kasta oo lammaaneyaasha qiimaha (values) loo kooxeeyo. Waxaan ku kooxeyn karnaa iyagoo adeegsanaya qawska (brackets).

Tusaalooyin

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

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

Tusaale ma aha

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

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

**Qaabka caadiga ah (standard form) - tan waxaa lagu
qeexi doonaa darsiga**

Qaabka casharka

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



Qaabka caadiga ah (standard form) ilaa caadiga



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

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)

Siyaabo badan oo aad u qori kartid tirokan?

57 300 000 000 000

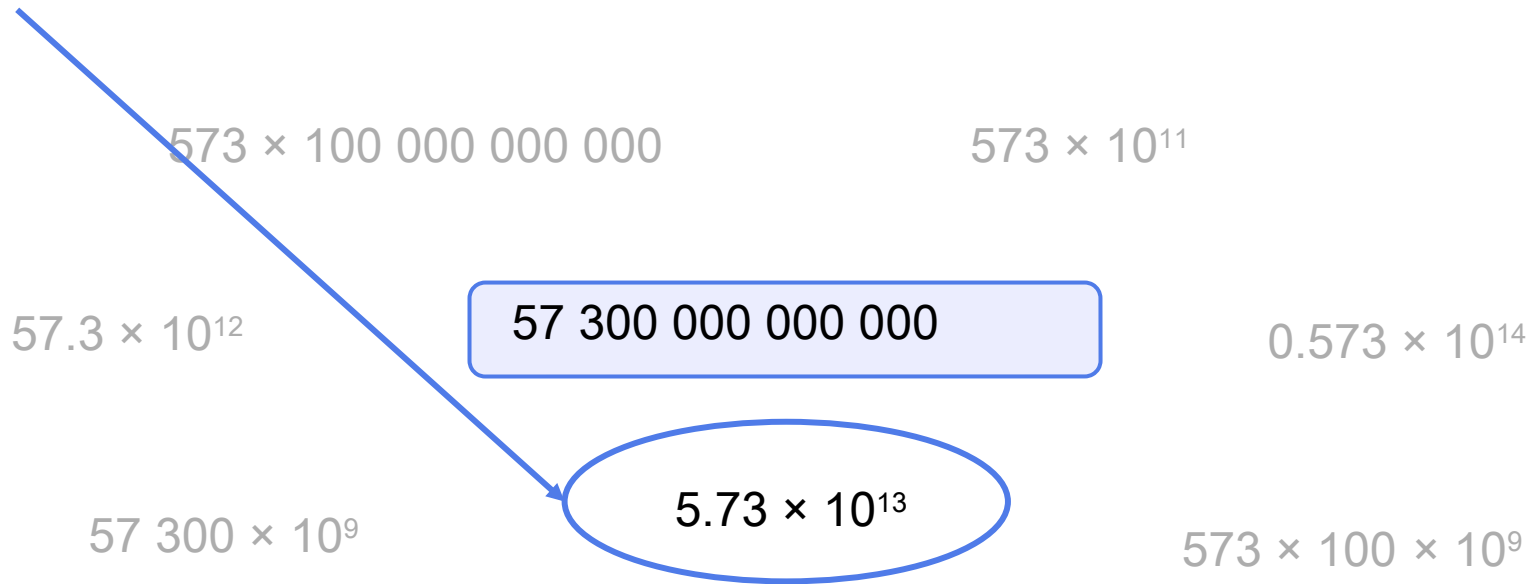
Waxaa laga yaabaa inaad ka fikirtay kuwa kale.

Mid ka mid ah kuwan ayaa ku qoran qaab caadi ah (standard form).



Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)

Kan waa tiro ku qoran qaab caadi ah (standard form).



Maxay tahay waxa aad u malaynaysaa in qaabka caadiga ah (standard form) macneheedu yahay?

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)

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

57 300 000 000 000

5.73×10^{13}

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)

Maxay tahay sababta aad u malaynayso in qorista tiro qaab caadi ah (standard form) ay faa'iido u leedahay?

Tusaale ahaan,

$$680\,000\,000\,000 = 6.8 \times 10^{11}$$

Saxnimada tirada (accuracy)
lama luminayo

Suurtagalnimada qalad marka la koobiyeenayo
dhammaan tirooyinka (digits)

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)

Kuwee ka mid ah kuwan soo socda ayaa loo qoray qaab caadi ah oo sax ah (correct standard form)? Sharax sababta kuwa kale si khaldan loogu qoray.

a

$$9.8 \times 10^4$$



Kani waa qaab caadi ah oo sax ah (correct standard form).

b

$$89.2 \times 10^9$$

Kani waa khalad sababtoo ah tirada $89.2 > 10$

c

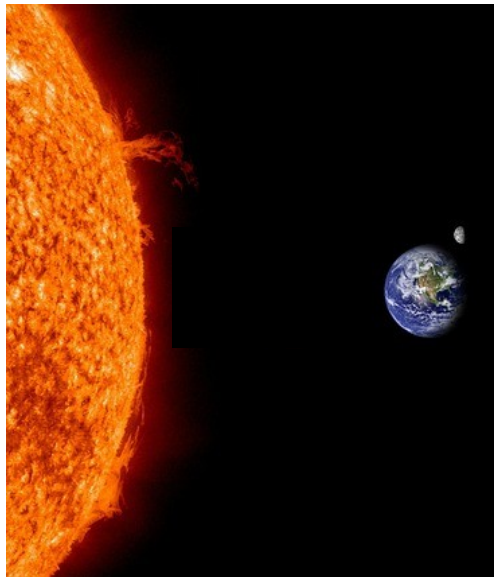
$$0.016 \times 10^{12}$$

d

$$1.2456 \times 10^2$$



Kani waa qaab caadi ah oo sax ah (correct standard form).

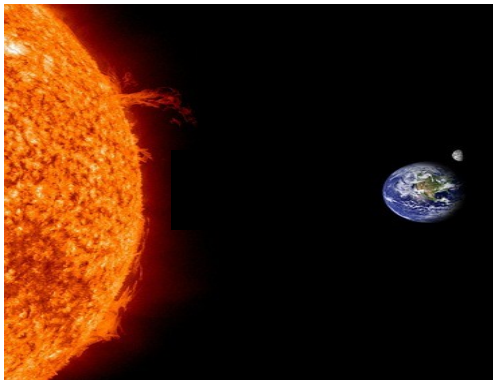


Fogaanta Dhulka iyo Qorraxdu waxay qiyaas ahaan tahay 150 bilyan mitir (metres).

Aynu isticmaalno jaantuska qiimaha meesha (place value chart) si aan u tuso sida tirooyinkani u ekaanayaan.

Masaafada dhulka ilaa qorraxdu waa qiyaastii 150 bilyan mitir.

HB	TB	B	HM	TM	M	HTH	TTh	Th	H	T	O	t
10^{11}	10^{10}	10^9	10^8	10^7	10^6	10^5	10^4	10^3	10^2	10^1	10^0	10^{-1}
1	5	0	0	0	0	0	0	0	0	0		

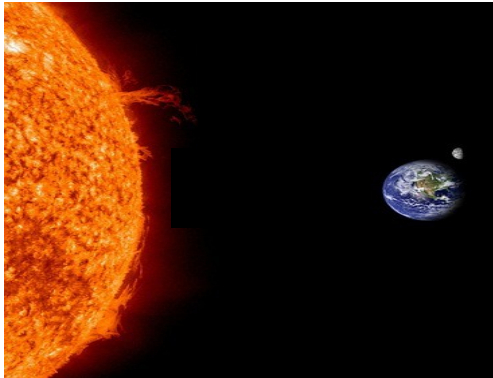


Gelinta nambarka jaantuska qiimaha meesha (place value chart),
maxaad u malaynaysaa inuu yahay qaabka caadiga ah (standard form)?

Qorista tirooyinka waaweyn qaabka caadiga ah (standard form)

Qorista qaabka caadiga ah (standard form) wuxuu bixiyaa 1.5×10^{11}

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O	t
10^{11}	10^{10}	10^9	10^8	10^7	10^6	10^5	10^4	10^3	10^2	10^1	10^0	10^{-1}
1	5	0	0	0	0	0	0	0	0			



Masaafada dhulka ilaa qorraxdu waa qiyaastii 150 bilyan mitir.

Isticmaalka jaantuska qiimaha meesha (place value chart) waa hab aad u fiican oo lagu arko tirada oo loo beddelo qaabka caadiga ah (standard form), laakiin waa waqti qaadasho.

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

HB	TB	B	HM	TM	M	HT _h	TT _h	Th	H	T	O	t
10^{11}	10^{10}	10^9	10^8	10^7	10^6	10^5	10^4	10^3	10^2	10^1	10^0	10^{-1}
1	5	0	0	0	0	0	0	0	0			

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)

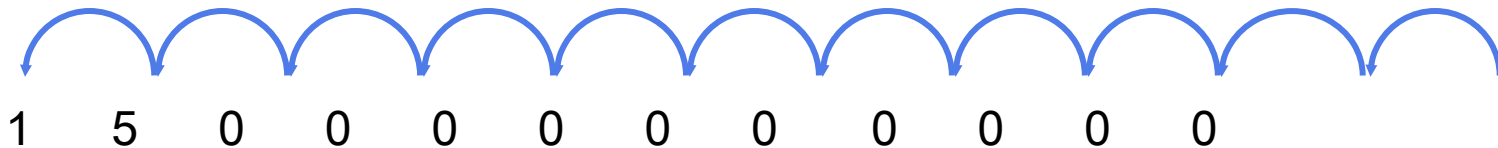
Tirade (digit) ugu horreysa ee muhiimka (significant figure) waxay gashaa tiirka kow (ones column), tirada (digits) kalena sidaas ku xigta.

Maxaynu ku dhufanaynaa 1.5 si aan u helno 150 bilyan?_{10¹¹}

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O	t
10 ¹¹	10 ¹⁰	10 ⁹	10 ⁸	10 ⁷	10 ⁶	10 ⁵	10 ⁴	10 ³	10 ²	10 ¹	10 ⁰	10 ⁻¹
1	5	0	0	0	0	0	0	0	0			
											1	5

Shaxda qiimaha meesha (place value chart) la'aanteed, sidee kale u heli kartaa jibbaarka (exponent) ee 11?

Waa tirada isku dhufashada (multiplications) ee 10 loo baahan yahay si tirade (digit) tiirka kow (ones column) ugu jirto tiirka saxda ah. Aynu tirinno.



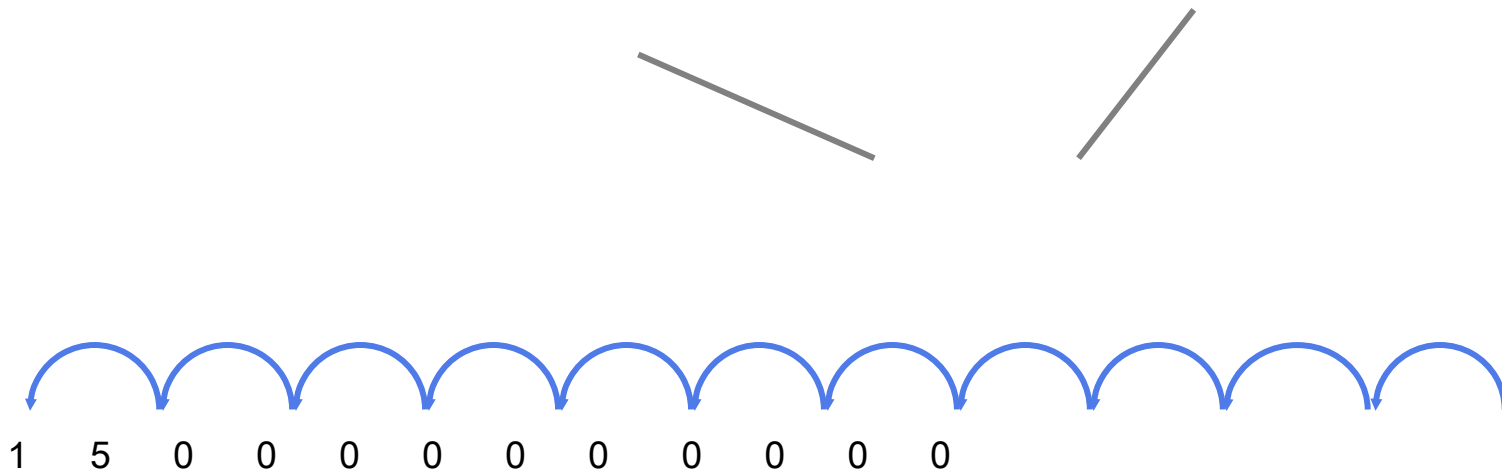
1 ● 5

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



Sharaxaad

Waxaa jira 11 isku dhufasho (multiplications) oo 10 ah oo loo baahan yahay laga bilaabo tiirka kow (ones column).



1 

Shaxda qiimaha meesha (place value chart) la'aanteed, u qor 956 000 000 qaabka caadiga ah (standard form):

956 000 000

9.56

Si aad u sawirto maskaxdaada, saf tirooyinka (digits) tiirka kow (ones column)

Qorista tirooyinka waaweyn qaabka caadiga ah (standard form)

Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor 956 000 000 qaabka caadiga ah (standard form).

956 000 000

9.56

Immisa jeer lagu dhuftey 10?

Qorista tirooyinka waaweyn qaabka caadiga ah (standard form)

Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor 956 000 000 qaabka caadiga ah (standard form).

956 000 000
9.56

Waxaa jiray 8 jeer oo lagu dhuftey 10 laga bilaabo tiirka kow (ones column).

Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor 780 000 qaabka caadiga ah (standard form).

780 000
7.8

Si aad u aragto, saf tirooyinka tiirka kow (ones column)

Qorista tirooyinka waaweyn qaabka caadiga ah (standard form)

Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor 956 000 000 qaabka caadiga ah (standard form).

956 000 000

9.56

Waxaa jiray 8 jeer oo lagu dhuftey 10 laga bilaabo tiirka kow (ones column).

$$9.56 \times 10^8$$

Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor 780 000 qaabka caadiga ah (standard form).

780 000
7.8


Immisa jeer boodbood ama lagu dhuftey 10?

Qorista tirooyinka waaweyn qaabka caadiga ah (standard form)

Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor 956 000 000 qaabka caadiga ah (standard form).

956 000 000

9.56

Waxaa jiray 8 jeer oo lagu dhuftey 10 laga bilaabo tiirka kow (ones column).

$$9.56 \times 10^8$$

Iyada oo aan la isticmaalin jaantuska qiimaha (place value), ku qor 780 000 qaabka caadiga ah (standard form).

780 000
7.8


Waxaa jiray 5 jeer oo lagu dhuftey 10 laga bilaabo tiirka kow (ones column).

$$7.8 \times 10^5$$

- 1) Iyada oo aan la isticmaalin jaantuska qiimaha (place value), u beddel kuwan soo socda qaabka caadiga ah (standard form).
- a) 15 000
 - b) 566 000 000
 - c) 9 800 000 000
 - d) 156 100
 - e) 563 000 000 000 000 000
 - f) 100 200 000 000

2) Saddex arday oo waxaa la siiyay 905 000 000 000 si ay u beddelaan qaab caadi ah. Sheeg halka ay ku qaladeen oo bixi jawaabta saxda ah.

905 000 000 000

Jawaabta: 905×109



905 000 000 000

Jawaabta: 9.5×10^{11}



905 000 000 000

Answer: 9.05×10^{10}

3) Sharax sababta qaabka caadiga ah u muhiim yahay.

1) Without using a place value chart, convert the following into **standard form**.

- a) 15 000
- b) 566 000 000
- c) 9 800 000 000
- d) 156 100
- e) 563 000 000 000 000 000
- f) 100 200 000 000

2) Saddex arday oo waxaa la siiyay 905 000 000 000 si ay u beddelaan qaab caadi ah. Sheeg halka ay ku qaladeen oo bixi jawaabta saxda ah.

905 000 000 000

Answer: 905×10^9

Qaybta koowaad ee qaabka caadiga ah waa inay leedahay tiro u dhaxaysa 1 iyo 10, oo ay ku jirto 1, laakiin aysan ku jirin 10.

$(1 \leq A < 10)$



905 000 000 000

Answer: 9.5×10^{11}

In order to correctly obtain 905 000 000 000, there must be a multiplication of powers of 10 to 9.05 not 9.5



905 000 000 000

Answer: 9.05×10^{10}

Si khaldan ayaa loo tiriyey tirada isku dhufashada 10. Waxaa jira 11 isku dhufasho oo 10 ah.

3) Sharax sababta qaabka caadiga ah u muhiim yahay.

- We write a number in **standard form** because it is easier, concise and more efficient to write numbers in this way.
- It reduces errors. It would take too long to write huge numbers and there would be more room for error when writing a number in its ordinary form.
- **Qaabka caadiga ah wuxuu u oggolaanayaa tiro kasta in loo qoro iyadoo la adeegsanayo hab caadi ah, sida $A \times 10^n$ halkaas oo $1 \leq A < 10$ iyo n uu yahay tiro isku mid ah.**
- When writing in a concise form, it is easier to use in calculations.

Qaabka casharka

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



Qaabka caadiga ah (standard form) ee tiro caadi ah



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

Qaabka caadiga ah (standard form) ee tiro caadi ah

Tirada (Number)	Qaabka jibbaarada (Exponential form)
1	10^0
10	10^1
100	10^2
1000	10^3
10 000	10^4
100 000	10^5
1 000 000	10^6

Aynu u beddelno tiro ku qoran
qaabka caadiga ah (standard form)
oo noqoto tiro caadi ah

U beddel 2.3×10^3 tiro caadi ah.

Marka la eego $\times 10^3$ oo matalaysa $\times$
1000, waxaan ognahay inay tahay

$$2.3 \times 1000 = 2300$$

Qaabka caadiga ah (standard form) ee tiro caadi ah

Geli calaamad (tick) agtooda weedhaha saxda ah. Halka jawaabtu khaldan tahay, qor tirada caadiga ah ee saxda ah.

a $5.63 \times 10^7 = 563\,000\,000$



Tirada saxda ah 56 300 000

b $2.3 \times 10^4 = 230\,000$



Tirada saxda ah 23 000

c $7.05 \times 10^4 = 75\,000$



Tirada saxda ah 70 500

d $7.02 \times 10^6 = 7\,020\,000$



1) U qor kuwan tirada caadiga ah.

a) 1.8×10^3

e) 8.02×10^3

b) 1.39×10^5

f) 5.001×10^5

c) 3.93×10^7

g) 1.2345×10^7

d) 4.413×10^8

h) 7.00004×10^8

1) U qor kuwan tirada caadiga ah.

a) 1.8×10^3

= 1 800

e) 8.02×10^3

= 8020

b) 1.39×10^5

f) 5.001×10^5

= 500 100

c) 3.93×10^7

= 139 000

d) 4.413×10^8

= 39 300 000

g) 1.2345×10^7

= 12 345 000

= 441 300 000

h) 7.00004×10^8

= 700 004 000

Qaabka casharka

Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



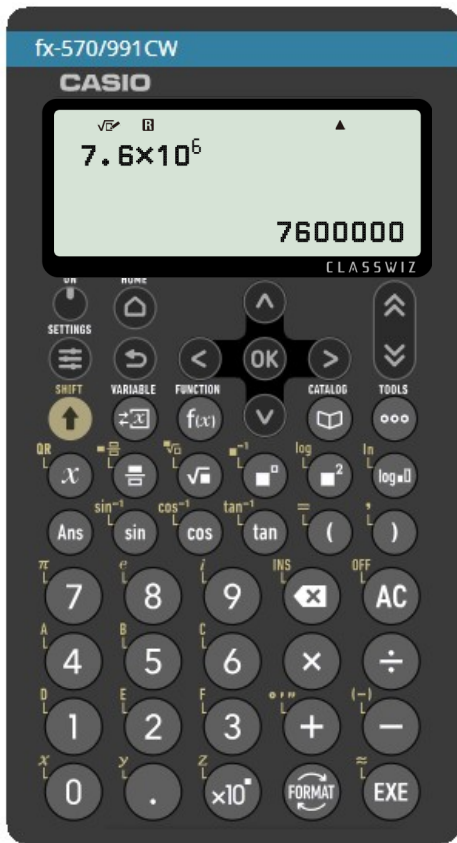
Qorista tirooyinka waaweyn ee qaabka caadiga ah (standard form)



Qaabka caadiga ah (standard form) ee tiro caadi ah



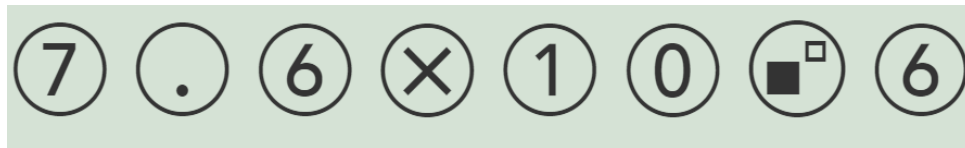
Qaabka caadiga ah (standard form) ee xisaabiyaha (calculator)



Hadda aan isticmaalno xisaabiyaha (calculator) si aan u bedelno

7.6×10^6 oo loo bedelo tiro caadi ah (ordinary number)

Isticmaalka gelinta (input)



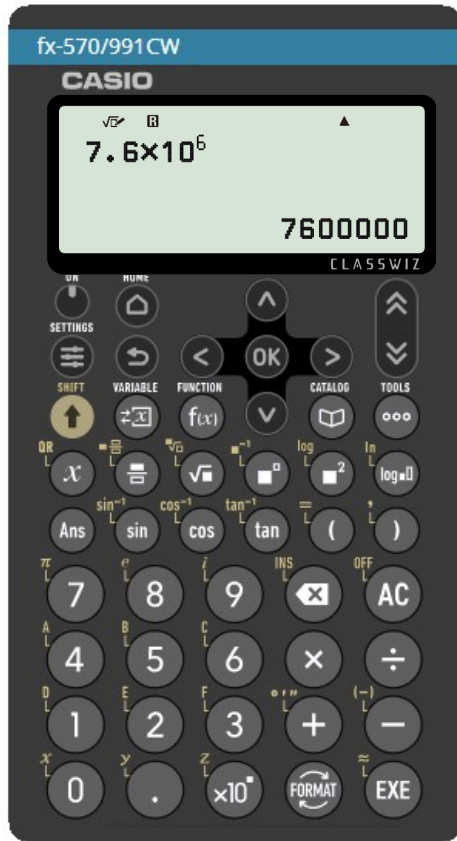
Riixida al



waxay soo saartaa natiijad (output) inay tahay

7 600 000

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



Tusaale ahaan, aan gelino (input)

$$7.6 \times 10^6$$

Isticmaalka gelinta (input)



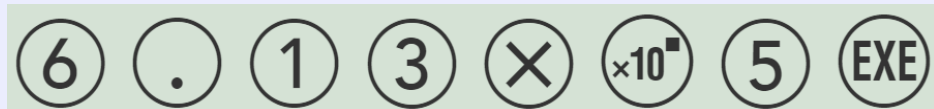
Riixida ϵ



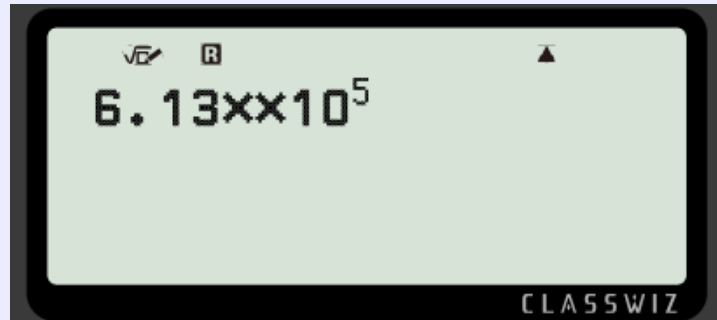
waxay soo saartaa natiijada (output) natiijada

7 600 000

Layla waxay gelisaa (input) xisaabtan xisaabiyaha (calculator).



Layla waxay isticmaashay laba isku dhufasho (multiplications) marka natiijadu (output) waa qalad (error).



1) Buuxi macluumaadka maqan.

a) 

The calculator screen displays 6.2×10^5 in the top line and 620000 in the bottom line. The top line also shows a checkmark icon, a 'R' icon, and a triangle icon. The bottom line shows the brand name 'CLASSWIZ'.

c)



The calculator screen displays 8600000000000000 in the top line and 8.6×10^{15} in the bottom line. The top line also shows a checkmark icon, a 'R' icon, and a triangle icon. The bottom line shows the brand name 'CLASSWIZ'.

b) 

The calculator screen displays 5366000000 in the bottom line. The top line shows a checkmark icon, a 'R' icon, and a triangle icon. The top line also has a dashed box for input, followed by $\times 10^{\square}$. The bottom line shows the brand name 'CLASSWIZ'.

d)



The calculator screen displays 6.3204×10^{13} in the bottom line. The top line shows a checkmark icon, a 'R' icon, and a triangle icon. The top line also has a dashed box for input. The bottom line shows the brand name 'CLASSWIZ'.

2) Baar goorta tirada noqoto mid aad u weyn oo xisaabiyaha (calculator) u bedelo qaabka caadiga ah (standard form).

1) Buuxi macluumaadka maqan.

a)  c)

The calculator screen shows 6.2×10^5 in the top display and 620000 in the bottom display. The top display has a dashed box next to the 10, and the bottom display has the text CLASSWIZ.

 c)

The calculator screen shows 8600000000000000 in the top display and 8.6×10^{15} in the bottom display. The top display has a dashed box next to the 10, and the bottom display has the text CLASSWIZ.

b)  d)

The calculator screen shows 5366000000 in the top display and 5.366×10^9 in the bottom display. The top display has a dashed box next to the 10, and the bottom display has the text CLASSWIZ.

 d)

The calculator screen shows 6.3204×10^{13} in the top display. The top display has a dashed box next to the 10, and the bottom display has the text CLASSWIZ.

2) Baar (Investigate) marka tirada ay noqoto mid aad u weyn oo kalkuleetarka (calculator) u beddelo qaabka caadiga ah (standard form).
Tirada oo ku taal shaashadda oo ka badan 9 godan (digits) waxaa loo beddelaa qaabka caadiga ah (standard form).

Waxaan u qornaa tiro qaabka caadiga ah (standard form) sababtoo ah waa sahlan, kooban, oo wax ku ool ah in tirooyinka loo qoro sidan.

Haddii aynaan u qorin tirooyinka waaweyn qaabka caadiga ah (standard form), waxay qaadan lahayd waqti dheer in la qoro tirooyinka waaweyn, waxaana jiri lahayd meel badan oo khalad (error) ah marka la qorayo tiro qaabkeeda caadiga ah.

Qaabka caadiga ah (standard form) wuxuu u oggolaanayaa tiro kasta in loo qoro iyadoo la adeegsanayo hal hab oo caadi ah, sida $A \times 10^n$, (halkaas oo $1 \leq A < 10$ iyo n uu yahay tiro isku-dhafan (integer)).