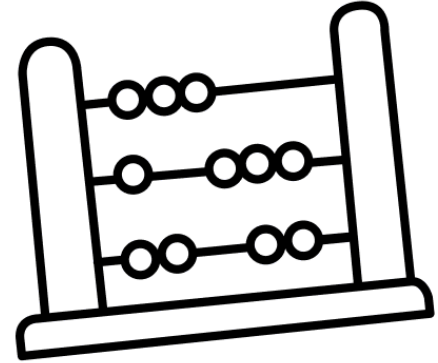


Tirooyinka 10 ee ku lug leh jibbaarada taban (negative exponents)



Maths

Cutub: Qaabka caadiga ah (Standard form)

Natiijo

Waxaan u qori karaa tiro kasta oo dhammaystiran (integer) qaabab kala duwan.

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

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

Qaabka casharka

Tirooyinka 10 ee ku lug leh jibbaarada taban (negative exponents)



Soo bandhigida jibbaarada taban (negative exponents)



Qorista tirooyinka dhammaystiran (integers) qaabab kala duwan

Waa maxay 45?

Jibbaarku (exponent) wuxuu noo sheegaa inta qiime ee isku mid ah ee la isku dhufto.

$$4^5 = 4 \times 4 \times 4 \times 4 \times 4$$

Waxaad aragtay jibbaarada (exponents) oo loo isticmaalay tirooyinka labajibbaaran (square) iyo saddex-jibbaaran (cube).

Waxaan sidoo kale aragnay jibbaarada (exponents) marka aan tixgelinayno qiimaha meesha (place value).

Th	H	T	O	t	h	th
1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
$10 \times 10 \times 10$	10×10	10	1			
10^3	10^2	10^1	10^0			



Cabdi

Haddii aan u qori karno 1000, 100 iyo 10 qaab jibbaaran (exponent form), hubaal waxaan u qori karnaa kuwa kale sidoo kale qaab jibbaaran.

Waxaan u malaynayaa inaad sax tahay.



Caasha



$$\frac{1}{10} = \frac{1}{10^1} = \frac{1}{10}$$

$$\frac{1}{100} = \frac{1}{10^2} = \frac{1}{10} \times \frac{1}{10}$$

$$\frac{1}{1000} = \frac{1}{10^3} = \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10}$$

Qaabka jibbaarada (exponent form)

macneheedu waa isku dhufasho soo Hagaag, waxaan ognahay in 10 sidoo noqnoqota. Maxay isku dhufashooyin kale loo qori karo 101, 100 loo qori soo noqnoqotay halka ka dhaceen? karo 102 iyo 1000 loo qori karo 103.

Waxaan dib u qori karnaa kuwan sida ...



Cabdi



Caasha



Th	H	T	O		t	h	th
1000	100	10	1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
$10 \times 10 \times 10$	10×10	10	1	•	$\frac{1}{10}$	$\frac{1}{10} \times \frac{1}{10}$	$\frac{1}{10} \times \frac{1}{10} \times \frac{1}{10}$
10^3	10^2	10^1	10^0	•	$\frac{1}{10^1}$	$\frac{1}{10^2}$	

Jibbaaradu (exponents) way yaraanayaan markaad dhinaca midig u socoto. laakiin waxaan eegayay maadaxyaada markaad timaaddo qaybaha jajibka tobanle (decimal parts) waxay noqdaan isdhaaf (reciprocal).

Jibbaaradu (exponents) waxay hoos u dhacayaan mid kasta. Ma loo qori karaa 10-1?

Haasax. Ma waxba ogaatay?



Cabdi



Caasha



Sii wadida
qaabka
(pattern) waxay
u socotaa,
 10^{-1} , 10^{-2} ,
 10^{-3} , iwm.

Tirada (Number)	Qaabka jibbaarada (Exponential form)
1000	10^3
100	10^2
10	10^1
1	10^0
0.1	10^{-1}
0.01	10^{-2}
0.001	10^{-3}
0.0001	10^{-4}



Soo bandhigida jibbaarada taban (negative exponents)

Tirada (Number)	Qaab jajab (Fractional form)	Qaab jibbaar (Exponential form)
0.1	$\frac{1}{10}$	10^{-1}
0.01	$\frac{1}{100}$	10^{-2}
0.001	$\frac{1}{1000}$	10^{-3}
0.0001	$\frac{1}{10\ 000}$	10^{-4}



Cabdi

Taas macneheedu
waa in iyo 10^{-2} ay
isku mid yihiin.

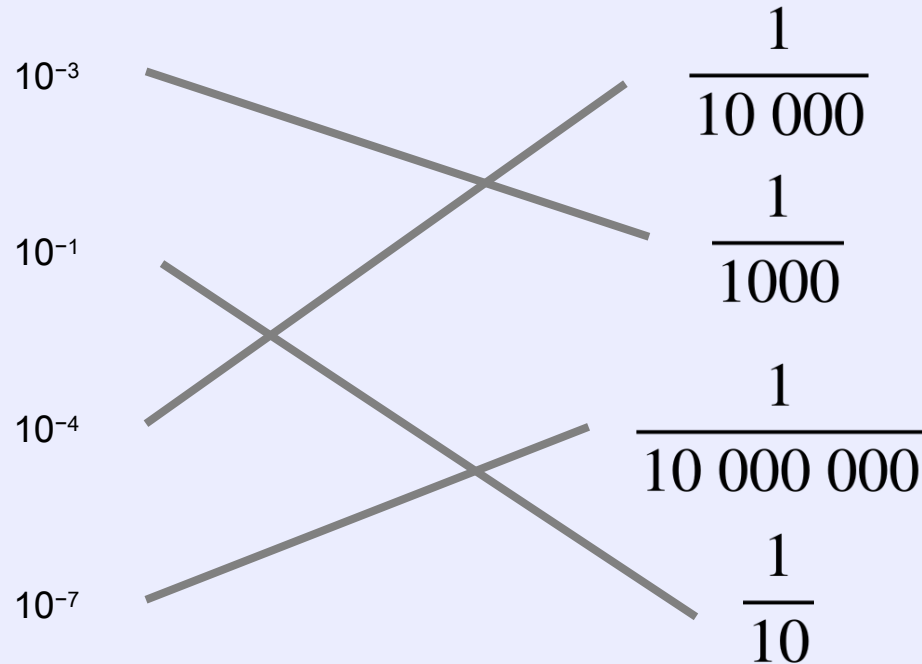
Taas macneheedu
waa 102 waa 100



Caasha

Soo bandhigida jibbaarada taban (negative exponents)

Isku dhig qaababka jajabka (fractional forms) iyo qaabka jibbaarka (exponential form):



Soo bandhigida jibbaarada taban (negative exponents)

0	•	t	h	th	tth	hth
1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10\ 000}$	$\frac{1}{100\ 000}$
10^0	•	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
	•					

Aan eegno sida wax waliba isugu xiran yihiin. Waxaan ku bilaabaynaa tirada 1

Waxaan dhaqaajinayaa tirada 1 hal meel oo midig.

1 hadda wuxuu ku jiraa tiirka tobanle (tenths).

Soo bandhigida jibbaarada taban (negative exponents)

Aan tan ku tijaabino jajab tobanle (decimals) fudud.

E.g. 0.007

0	•	t	h	th	tth	hth
1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10\ 000}$	$\frac{1}{100\ 000}$
10^0	•	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	•	0	0	7		

$$0.007 = 7 \times \frac{1}{1000} = \frac{7}{1000} = 7 \times 10^{-3}$$

Soo bandhigida jibbaarada taban (negative exponents)

Aan tijaabinno tan iyadoo la adeegsanayo jajab tobanle (decimals) fudud marka hore.

E.g. 0.0002

0	•	t	h	th	tth	hth
1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10\ 000}$	$\frac{1}{100\ 000}$
10^0	•	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	•	0	0	0	2	0

$$0.0002 = 2 \times \frac{1}{10\ 000} = \frac{2}{10\ 000} = 2 \times 10^{-4}$$

Soo bandhigida jibbaarada taban (negative exponents)

Ku qor 0.09 qaab jibbaaraneed oo fidiyey (expanded exponential form).

0	•	t	h	th	tth	hth
1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10\ 000}$	$\frac{1}{100\ 000}$
10^0	•	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	•	0	9			

$$0.09 = 9 \times \frac{1}{100} = \frac{9}{100} = 9 \times 10^{-2}$$

Soo bandhigida jibbaarada taban (negative exponents)

Hore waxaad u isticmaali jirtay shabakadda qiimaha meesha (place value grid) si aad ugu qorto tirooyinka qaabkooda fidiyey (expanded form).

E.g. 8349

HTh	TTh	Th	H	T	O
10^5	10^4	10^3	10^2	10^1	10^0
		8	3	4	9

Soo bandhigida jibbaarada taban (negative exponents)

Hore waxaad u isticmaali jirtay shabakadda qiimaha meesha (place value grid) si aad ugu qorto tirooyinka qaabkooda fidiyey (expanded form).

E.g. 20 586

HTh	TTh	Th	H	T	O
10^5	10^4	10^3	10^2	10^1	10^0
	2	0	5	8	6

Waa immisa tiradan?

$$2 \times 10^6 + 9 \times 10^4 + 5 \times 10^2 + 8 \times 10^0$$



Cabdi wuxuu qoray 2958

Qaladkee ayuu Cabdi sameeyay?

Wuxuu kaliya qoray lambarrada 2, 9, 5 iyo 8 isagoon tixgelin qiimaha (value) goobta lambar kasta.

Waa inay ahaataa 2 090 508

Soo bandhigida jibbaarada taban (negative exponents)

Hadda aan ku fidinno tirooyinka jajab tobanle (decimals).

E.g. 0.0487

0	•	t	h	th	tth	hth
1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10\ 000}$	$\frac{1}{100\ 000}$
10^0	•	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	•	0	4	8	7	

$$0.0487 = 4 \times 10^{-2}$$

Soo bandhigida jibbaarada taban (negative exponents)

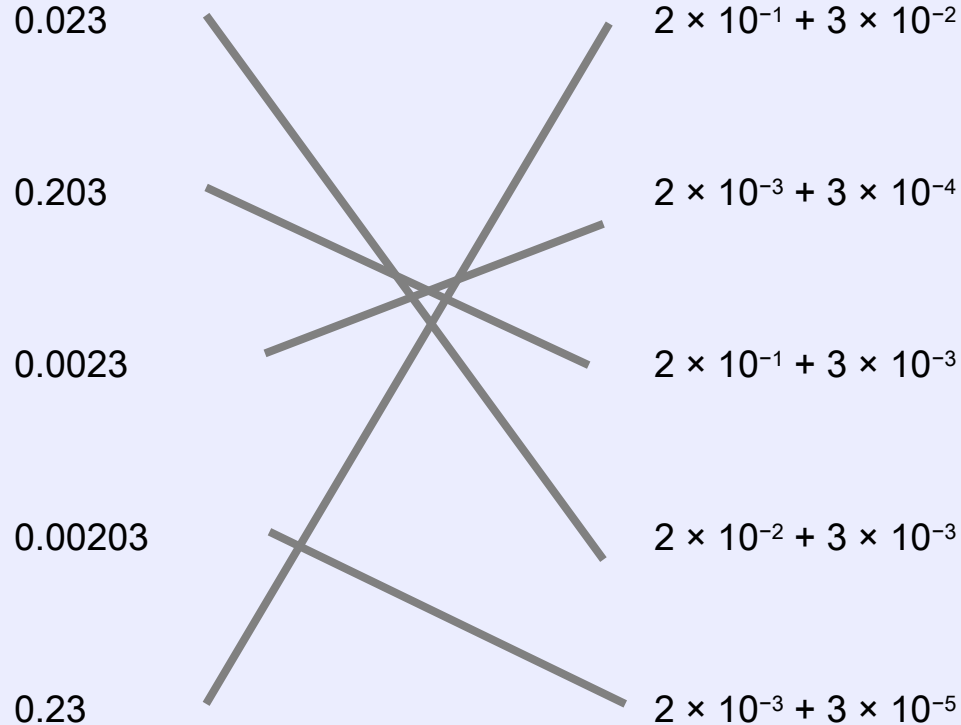
E.g. 0.00104

0	•	t	h	th	tth	hth
1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10\ 000}$	$\frac{1}{100\ 000}$
10^0	•	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	•	0	0	1	0	4

$$0.00104 = 1 \times 10^{-3} \dots$$

Soo bandhigida jibbaarada taban (negative exponents)

Ku xidh jajab tobanle (decimal) qaabkiisa fidaysan (expanded form) ee saxda ah.



1) Buuxi meelaha bannaan:

	Jajab tobanle (Decimal)	Jajab (Fraction)	Qaab jibbaaran (Exponential Form)
a	0.09		
b		$\frac{4}{100\,000}$	
c			3×10^{-1}
d		$\frac{2}{10}$	
e	0.0007		
f			8×10^{-6}
g		$\frac{7}{1000}$	
h			5×10^{-4}

2) Khatadkee ayay Caasha samaysay?

Ku qor 0.0003 qaab jibbaaran oo fidsaysan (expanded exponential form).

Caasha waxay qortaa:

$0.0003 = 3 \times 10^{-3}$ sababtoo ah waxaa jira 3 eber (zeros) ka dib barta jajabka tobarie (decimal point).



Caasha

3) Ku qor mid kasta oo ka mid ah kuwa soo socda qaabka kale (alternative format):

	Jajab tobanle (Decimal)	Qaab jibbaaran (Exponential form)
a	0.34	
b		$5 \times 10^{-1} + 2 \times 10^{-2}$
c		$4 \times 10^{-2} + 7 \times 10^{-3} + 3 \times 10^{-4}$
d	0.049	
e	0.000603	
f		$2 \times 10^{-1} + 3 \times 10^{-4} + 3 \times 10^{-6}$
g	17.02	
h		$2 \times 10^2 + 3 \times 10^{-1} + 5 \times 10^{-3} + 8 \times 10^{-4}$

1) Buuxi meelaha bannaan:

	Jajab tobanle (Decimal)	Jajab (Fraction)	Qaab jibbaaran (Exponential Form)
a	0.09	$\frac{9}{100}$	9×10^{-2}
b	0.00004	$\frac{4}{100\ 000}$	4×10^{-5}
c	0.3	$\frac{3}{10}$	3×10^{-1}
d	0.2	$\frac{2}{10}$	2×10^{-1}
e	0.0007	$\frac{7}{10\ 000}$	7×10^{-4}
f	0.000008	$\frac{8}{1\ 000\ 000}$	8×10^{-6}
g	0.007	$\frac{7}{1000}$	7×10^{-3}
h	0.0005	$\frac{5}{10\ 000}$	5×10^{-4}

2) Waa maxay qaladka Caasha sameysay?

Qor 0.0003 qaabka exponential (exponential form) ee la fidiyay.

Caasha waxay qortay:

$0.0003 = 3 \times 10^{-3}$ sababtoo ah waxaa jira 3 eber (zeros) ka dib barta tobanle (decimal point).

3 wuxuu ku jiraa tiirka meel- tobnaad ee kumanka (ten thousandths column).

10^{-3} waa kunmeel (one thousandth), ma aha meel-tobnaad kumanka (one ten thousandth).

Sidaa darteed, jawaabtu waa inay noqotaa 3×10^{-4}



Caasha

3) Qor mid kasta oo ka mid ah kuwan soo socda qaabka kale:

	Tobanle (Decimal)	Qaabka exponential (Exponential form)
a	0.34	$3 \times 10^{-1} + 4 \times 10^{-2}$
b	0.52	$5 \times 10^{-1} + 2 \times 10^{-2}$
c	0.0473	$4 \times 10^{-2} + 7 \times 10^{-3} + 3 \times 10^{-4}$
d	0.049	$4 \times 10^{-2} + 9 \times 10^{-3}$
e	0.000603	$6 \times 10^{-4} + 3 \times 10^{-6}$
f	0.200303	$2 \times 10^{-1} + 3 \times 10^{-4} + 3 \times 10^{-6}$
g	17.02	$1 \times 10^1 + 7 \times 10^0 + 2 \times 10^{-2}$
h	200.3058	$2 \times 10^2 + 3 \times 10^{-1} + 5 \times 10^{-3} + 8 \times 10^{-4}$

Qaabka casharka

Tirooyinka 10 ee ku lug leh jibbaarada taban (negative exponents)



Soo bandhigida jibbaarada taban (negative exponents)



Qorista tirooyinka (integers) qaabab kala duwan

Qorista tirooyinka (integers) qaabab kala duwan



Imisa siyaabood oo kala duwan ayaad u qori kartaa 6300?

Haddii aan hayno 63, sidee kale loo qori karaa?

$$\frac{63}{10}$$

Waxaa jira tiro aan dhamaad lahayn oo siyaabo ah oo loo qori karo tiro kasta (integer).

Qorista tirooyinka (integers) qaabab kala duwan

Kee ka mid ah kuwan soo socda waa siyaabo kale oo loo qoro 27 000?

$$2\,700\,000 \times 10^{-2}$$



$$\frac{27}{10} \times 10^4$$



$$27 \times 10^3$$



$$\frac{270}{10} \times 100\,000$$



$$2.7 \times 10^3$$



$$27 \times 10$$



$$0.27 \times 10^5$$



$$2.7 \times 10\,000$$



$$\frac{2700}{10^2} \times 10^3$$



Hadda waxaan eegi doonnaa qaar ka mid ah kuwa ugu adag.

Qorista tirooyin (integers) qaabab kala duwan

$$\frac{27}{10} \times 10^4$$


Waxaan dib u qori karnaa sidan: $27 \div 10 \times 10\,000$

$\square$

$$2.7 \times 10^3$$


Waxaan dib u qori karnaa sidan: 2.7×1000

$$\left\{ \frac{2700}{10^2} \times 10^3 \right\}$$

Waxaan dib u qori karnaa sidan: $2700 \div 100 \times 1000$



$$2\,700\,000 \times 10^{-2}$$



Waxaan dib u qori karnaa sidan: $2\,700\,000 \times \frac{1}{10^2}$

$$\frac{1}{100}$$

$$\frac{2\,700\,000}{100}$$

Qorista tirooyin (integers) qaabab kala duwan

Kuwee ka mid ah kuwan soo socda ayaa ah qaabab kale oo loo qoro 340?

a 3.4×10^2 ✓

b $\frac{340}{10} \times 10$ ✓

c $34\,000 \times 10^{-2}$ ✓

d $\frac{34\,000}{10^2} \times 10^{-1}$ ✗

- 1) Aqoonso beddelka khaldan ee saf kasta. Qor xarafka oo dib u habeey si aad u samaysid eray.

Tirada (Number)	Beddelka 1 (Alternative 1)		Beddelka 2 (Alternative 2)		Beddelka 3 (Alternative 3)		Beddelka 4 (Alternative 4)	
3000	3×10^4	N	$3 \times 10^2 \times 10$	L	$\frac{30}{10} \times 10^3$	I	$\frac{300}{10} \times 10^2$	Y
74 000	7.4×10^4	A	74×10^3	P	7.4×10^3	X	$\frac{740\,000}{10}$	C
120 000	$12 \times 10^2 \times 10^2$	R	1.2×10^5	H	1.2×10^4	E	$1.2 \times 10^6 \times 10^{-1}$	B
450	4500×0.1	S	$\frac{450}{10^3} \times 10^3$	E	4.5×10^2	F	4.5×10^{-2}	O
8 000 000	$8 \times 10^3 \times 10^3$	T	$\frac{8}{10^3} \times 10^8$	P	8×10^6	V	$\frac{8000}{10^2} \times 10^5$	D
628 000	$6\,280\,000 \times 10^{-1}$	O	6.28×10^5	D	6.28×10^3	N	628×10^3	P
32 490	32.49×10^2	E	$\frac{3249}{10^4} \times 10^5$	M	$\frac{3249}{10^4} \times 10^5$	A	$324\,900 \times 10^{-1}$	H
12 400 000	$12.4 \times 10^{-3} \times 10^9$	N	$\frac{124}{10^2} \times 10^7$	L	1.24×10^7	O	$124 \times 10^{-2} \times 10^6$	T

1) Aqoonso beddelka khaldan ee saf kasta. Qor xarafka oo dib u habeey si aad u samaysid eray. EXPONENT

Tirada (Number)	Beddelka 1 (Alternative 1)	Beddelka 2 (Alternative 2)	Beddelka 3 (Alternative 3)	Beddelka 4 (Alternative 4)
3000	3×10^4	$3 \times 10^2 \times 10$	$\frac{30}{10} \times 10^3$	$\frac{300}{10} \times 10^2$
74 000	7.4×10^4	74×10^3	7.4×10^3	$\frac{740\,000}{10}$
120 000	$12 \times 10^2 \times 10^2$	1.2×10^5	1.2×10^4	$1.2 \times 10^6 \times 10^{-1}$
450	4500×0.1	$\frac{450}{10^3} \times 10^3$	4.5×10^2	4.5×10^{-2}
8 000 000	$8 \times 10^3 \times 10^3$	$\frac{8}{10^3} \times 10^8$	8×10^6	$\frac{8000}{10^2} \times 10^5$
628 000	$6\,280\,000 \times 10^{-1}$	6.28×10^5	6.28×10^3	628×10^3
32 490	$32\,49 \times 10^2$	$\frac{324.9}{10^2} \times 10^2$	$\frac{3249}{10^4} \times 10^5$	$324\,900 \times 10^{-1}$
12 400 000	$12.4 \times 10^{-3} \times 10^9$	$\frac{124}{10^2} \times 10^7$	1.24×10^7	$124 \times 10^{-2} \times 10^6$

Soo koobid Tirooyinka 10 ee leh jibbaarada (exponents) taban

Madaxyada jadwalka qiimaha (place value chart) ee jibbaarada (exponential) waxaa lagu kordhin karaa qaybaha jajabka (decimal).

1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10\ 000}$	$\frac{1}{100\ 000}$
10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
0	0	4	8	7	

$$0.0487 = 4 \times 10^{-2} + 8 \times 10^{-3} + 7 \times 10^{-4}$$

$$\frac{1}{100}$$

$$10^{-2} = 0.01 =$$

Tirooyinka (integers) waxaa loo qori karaa qaabab kala duwan.

$$\text{E.g. } 450 = 4500 \times 0.1 = 4500 \times \frac{1}{10} = 4500 \times 10^{-1} = \frac{450}{10^3} \times 10^3$$