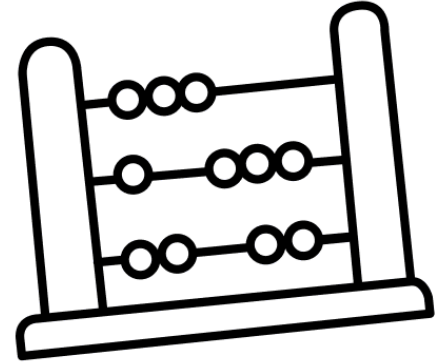


Beddelka mawduuca iyadoo la adeegsanayo qaacidada fudud (simple formula)



Maths

Cutub: Tibaaxaha iyo qaacidooyinka (Expressions and formulae)

Natiijo

Waxaan awoodi karaa inaan ku dabaqo fahanka hawlgallada rogaal-celinta (inverse operations) qaacido fudud si aan uga dhigo doorsoome gaar ah mawduuca.

Mawduuca isla'egta/qaacidada waa doorsoome lagu muujiyo doorsoomayaasha kale. Waa inuu leeyahay jibbaar (exponent) 1 iyo isugeyn (coefficient) 1.

Tusaale ahaan, a waa mawduuca qaacidadan $a = \sqrt{c^2 - b^2}$

laakiin, a^2 ma aha mawduuca qaacidadan $a^2 = c^2 - b^2$

Qaabka casharka

Beddelka mawduuca iyadoo la adeegsanayo qaacidada fudud (simple formula)



Aqoonsiga mawduuca qaacidada



Beddelka mawduuca qaacidada fudud

Dib-u-habaynta isla'egyada iyo qaacidooyinka waa xirfad qiimo leh xagga xisaabta.

$$4 + 6 = 10$$

Kani waa 10 oo lagu muujiyey 4 iyo 6

$$4 = 10 - 6$$

Sidee u ekaanaysaa 4 oo lagu muujiyey 10 iyo 6?

$$6 = 10 - 4$$

Sidee u ekaanaysaa 6 oo lagu muujiyey 10 iyo 4?

Waxaan guud uga dhigi karnaa qaanuunka dib-u-habaynta xiriirrada isku-darka (additive relationships).



Aqoonsiga mawduuca (subject) ee qaacidada (formula)



Mawduuca (subject) isla'egta/qaacidada waa doorsoome (variable) loo qoray iyadoo la eegayo doorsoomayaasha kale. Waa inuu leeyahay jibbaar (exponent) 1 iyo isweyneeye (coefficient) 1.

$$a = c - b$$

a waxaa loo qoray iyadoo la eegayo c iyo b

Qaabkan, a waa mawduuca (subject) isla'egta (equation).

$$b = c - a$$

b waxaa loo qoray iyadoo la eegayo c iyo a

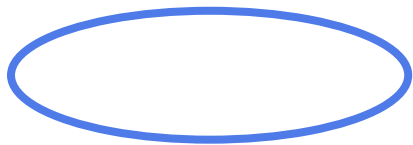
Qaabkan, b waa mawduuca (subject) isla'egta (equation).

Aqoonsiga mawduuca (subject) ee qaacidada (formula)



Mawduuca (subject) isla'egta/qaacidada waa doorsoome (variable) loo qoray iyadoo la eegayo doorsoomayaasha kale. Waa inuu leeyahay jibbaar (exponent) 1 iyo isweyneeye (coefficient) 1.

Xalli $y + 35 = 78$



Qaabkan, y waa mawduuca (subject) isla'egta (equation).

Marka la eego isla'egtan, waxaanu xisaabin karnaa tirada aan la garanayn (unknown) isla markiiba, sababtoo ah waa mawduuca (subject).

Gudbinta (generalisation) xiriirrada isku-darka (additive relationships).



Qaabkan, a waa mawduuca (subject) isla'egta (equation).

Qaabkan, b waa mawduuca (subject) isla'egta (equation).

Haddaba, waa maxay mawduuca (subject) qaabka asalka ah?

Jawaabaha:

$$a + b = c$$

$$b + a = c$$

$$a = c - b$$

$$b = c - a$$

Gudbinta (generalisation) xiriirrada isku-darka (additive relationships).

$$a + b = c$$

Waxaan u malaynayaa in a uu yahay mawduuca (subject), sababtoo ah waa shayga 1aad ee dhinaca bidix (LHS).

Ma raacsan tahay?



Cali

Haddaba, waa maxay mawduuca (subject) qaabka asalka ah?

Guud ahaan xiriirka isku darka (additive relationships).

$$a + b = c$$

Waxaan u malaynayaa in a uu yahay mawduuca sababtoo ah waa shayga 1aad ee dhinaca bidix (LHS).

Ee fiiri qeexida mawduuca mar kale Andeep.



Andeep



Sofia

Mawduuca isla'egta/qaacidada waa doorsoome (variable) lagu muujiyay doorsoomayaasha kale. Waa inuu leeyahay jibbaar (exponent) 1 iyo isugeyn (coefficient) 1

Guud ahaan xiriirka isku darka (additive relationships).

$$a + b = c$$

Mawduucu waa inuu ahaadaa c sababtoo ah kani waa c lagu muujiyay doorsoomayaasha kale.

Si fiican ayaad u saxday Andeep! c waa mawduuca.
Mawduucu wuxuu joogi karaa dhinaca bidix ama midig.



Andeep



Sofia

Mawduuca isla'egta/qaacidada waa doorsoome (variable) lagu muujiyay doorsoomayaasha kale. Waa inuu leeyahay jibbaar (exponent) 1 iyo isugeyn (coefficient) 1

$$a^2 + b^2 = c^2$$

$$b^2 + a^2 = c^2$$

$$a^2 = c^2 - b^2$$

$$b^2 = c^2 - a^2$$

Waxaan bartay saddexagalka qumman (right-angle triangles) dhowaan oo waxaan arkay qaacidadan.

Marka waxaan dib u habayn karaa xiriirkan sidan.

Haa. Waa sax. Waxaad dib u habayn kartaa sidii xiriir kasta oo isku darka ah.



Sofia



Andeep

$$a^2 + b^2 = c^2$$

$$b^2 + a^2 = c^2$$

Marka waxaan yeelan karaa c^2 mawduuc.

$$a^2 = c^2 - b^2$$

$$b^2 = c^2 - a^2$$

Ama waxaan ka dhigi karaa a^2 mawduuca (subject). Waxay ku xiran tahay waxa aan doonayo inaan xisaabiyo.

Aynu dib u hubinno qeexidaas mawduuca (subject) Cali.



Cali



Mawduuca (subject) ee isla'egta/qaacidada waa doorsoome (variable) lagu muujiyay iyadoo la eegayo doorsoomayaasha kale. Waa inuu leeyahay jibbaar (exponent) 1 ah iyo isweyneeye (coefficient) 1 ah

Suad

$$a^2 + b^2 = c^2$$

$$b^2 + a^2 = c^2$$

Hadda waan arkay! Ma u yeeri karno a^2 mawduuca (subject) sababtoo ah ma laha jibbaar (exponent) 1 ah

$$a^2 = c^2 - b^2$$

$$b^2 = c^2 - a^2$$

Waa hagaag. Mawduucu (subject) waa inuu leeyahay jibbaar (exponent) 1 ah iyo isweyneeye (coefficient) 1 ah



Cali



Mawduuca (subject) ee isla'egta/qaacidada waa doorsoome (variable) lagu muujiyay iyadoo la eegayo doorsoomayaasha kale. Waa inuu leeyahay jibbaar (exponent) 1 ah iyo isweyneeye (coefficient) 1 ah

Suad

Midkee ka mid ah habayntan dib-u-habaynta isla'egta $x + y = z$ ayaa y yahay mawduuca (subject)?

a $x + y = z$ ✗

b $x = z - y$ ✗

c $y + x = z$ ✗

d $y = z - x$ ✓

Kaliya habaynta (rearrangement) halkaas oo y lagu muujiyay iyadoo la eegayo doorsoomayaasha kale.

Aqoonsashada mawduuca (subject) ee qaacidada (formula)

Midkee ka mid ah habayntan dib-u-habaynta isla'egta $x + y = z$ ayaa z yahay mawduuca (subject)?

- | | | | |
|----------|-------------|---|--|
| a | $x + y = z$ | ✓ | <i>z waxaa lagu muujiyay iyadoo la eegayo doorsoomayaasha kale. Mawduucu (subject) wuxuu ku yaali karaa dhinaca midig (RHS) ee isla'egta ama qaacidada.</i> |
| b | $x = z - y$ | ✗ | |
| c | $y + x = z$ | ✓ | <i>z waxaa lagu muujiyay iyadoo la eegayo doorsoomayaasha kale. Mawduucu (subject) wuxuu ku yaali karaa dhinaca midig (RHS) ee isla'egta ama qaacidada.</i> |
| d | $y = z - x$ | ✗ | |

Aqoonsashada mawduuca (subject) ee qaacidada (formula)

Run mise been?

Isla'egta $5y^2 = x + 7$ mawduucu (subject) waa $5y^2$



Run



Been



Sabab u sheeg jawaabtaada

Waxaan u baahanahay inaan sii hagaajinno ilaa y uu keligiis noqdo.

a

$5y^2$ ma aha mawduuca (subject) sababtoo ah ma laha jibbaar (exponent) 1 ama isku-dhufasho (coefficient) 1



b

$5y^2$ waa mawduuca (subject) sababtoo ah waxaa lagu muujiyay iyadoo la eegayo doorsoomayaasha kale.

Waxaan sidoo kale aqoonsan karnaa mawduuca (subject) xiriirka isku dhufashada (multiplicative).

Haddii $4 \times 8 = 32$ markaa...

$$32 \div 8 = 4$$

$$8 \times 4 = 32$$

$$32 \div 4 = 8$$

Guud ahaan (generalisation) xiriirka isku dhufashada (multiplicative).

$a \times b = c$	$\frac{c}{b} = a$
$b \times a = c$	$\frac{c}{a} = b$

Waxaan sidoo kale aqoonsan karnaa mawduuca (subject) xiriirka isku dhufashada (multiplicative).

$$a \times b = c \bigcirc$$

Qaabkan c waa mawduuca (subject) ee isla'egta (equation).

$$\frac{c}{b} = \bigcirc a$$

Qaabkan a waa mawduuca (subject) ee isla'egta (equation).

$$\bigcirc$$

Qaabkan c waa mawduuca (subject) ee isla'egta (equation).

$$\frac{c}{a} = \bigcirc b$$

Qaabkan b waa mawduuca (subject) ee isla'egta (equation).

Aqoonsashada mawduuca (subject) ee qaacidada (formula)

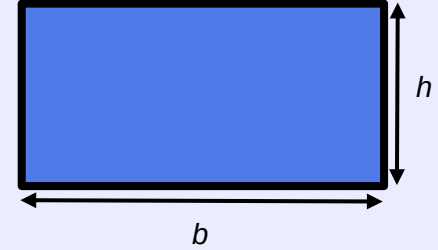
Hagaajinta kasta ee qaacidada (formula), aqoonso doorsoome (variable) kaas oo ah mawduuca (subject).

$$A = b \times h$$

$$\frac{A}{h} = b$$

$$A = h \times b$$

$$\frac{A}{b} = h$$



1) Aqoonso mawduuca (subject) mid kasta oo ka mid ah qaacidada/isla'egyadan.

a) $C = \pi d$

b) $y = 7x - 5$

c) $\frac{C}{\pi} = d$

d) $A = \frac{1}{2}bh$

e) $h = \frac{A}{b}$

f) $\frac{F}{m} = a$

g) $d = s \times t$

h) $P = 2(b + h)$

2) Caasha waxay xallinaysaa isla'egta (equation) $85 - 3x = 17$

Isle'egta (equation) waxaa loo habayn karaa qaababkan:

$$85 - 3x = 17$$

$$85 - 17 = 3x$$

$$85 = 17 + 3x$$

$$85 = 3x + 17$$



Qaabka $85 - 17 = 3x$ ayaa ah habaynta ugu fiican, sababtoo ah $3x$ waa mawduuca (subject).

Qor jumlad sharraxaysa waxa khaldan ee ku jira hadalka Caasha.



1) Ku aqoonsado mawduuca (subject) mid kasta oo ka mid ah qaaciddooyinkan/isle'egyahan (formula/equations).

a) $C = \pi d$

b) $y = 7x - 5$

c) $\frac{C}{\pi} = d$

d) $A = \frac{1}{2}bh$

e) $h = \frac{A}{b}$

f) $\frac{F}{m} = a$

g) $d = s \times t$

h) $P = 2(b + h)$

2) Caasha waxay xallinaysaa isle'egta (equation) $85 - 3x = 17$

Isle'egta (equation) waxaa loo habayn karaa qaababkan:

$$85 - 3x = 17$$

$$85 - 17 = 3x$$

$$85 = 17 + 3x$$

$$85 = 3x + 17$$



Qaabka $85 - 17 = 3x$ ayaa ah habaynta ugu fiican, sababtoo ah $3x$ waa mawduuca (subject).

Waxaa laga yaabaa inaad qortay:
Inkasta oo $85 - 17 = 3x$ uu yahay qaabka ugu fiican ee laga xalliyo, ma ugu yeeri karno $3x$ mawduuca (subject) sababtoo ah isugeeyaha (coefficient) waa 3 ma aha 1

Qaabka casharka

Beddelka mawduuca (subject) ee qaaciddada (formula) fudud



Aqoonsashada mawduuca (subject) ee qaaciddada (formula)



Beddelka mawduuca (subject) ee qaaciddada (formula) fudud

Waxaan u habayn karnaa isle'egyada (equations) iyo qaaciddooyinka (formula) iyadoo la isticmaalayo hawlgallo rogan (inverse operations).

$$x + 12 = 37$$

Tibaaxaha (expressions) dhinac kasta waxay ahaanayaan kuwo siman sababtoo ah waxaan ku sameynay hawlgallo isku mid ah labada dhinac.

x hadda waa mawduuca (subject) isle'egta (equation).

Laga soo bilaabo booskan waxaan haysannaa xalka (solution).

Waxaan u habayn karnaa isle'egyada (equations) iyo qaaciddooyinka (formula) iyadoo la isticmaalayo hawlgallo rogan (inverse operations).

$$x - 2.7 = 8.1$$

Tibaaxaha dhinac kasta waxay ahaanayaan siman (equal) sababtoo ah waxaan ku samaynay isla hawlgalka (operation) labada dhinac.

x hadda waa mawduuca (subject) isla'egta (equation).

Laga bilaabo booskan waxaan haynaa milan (solution).

Mararka qaarkood waxaan u baahan doonnaa inaan isticmaalno hawlgallo (operations) badan.

$$17 - y = 4$$

y hadda waa mawduuca (subject) isla'egta (equation).

Waxaan dib u habayn karnaa xiriirrada isku dhufashada (multiplicative) iyadoo la isticmaalayo mabaadi'da (principles) isku midka ah.

$$d = s \times t$$

Hawlgalka (operation) isku midka ah labada dhinac si loo ilaaliyo simaanta (equality).

$$\frac{d}{t} = s$$

s hadda waa mawduuca (subject) qaacidada (formula).

Waxaan ku bilownay d oo lagu muujiyey s iyo t waxaanan ku dhamaynay aragti kala duwan; s oo lagu muujiyey d iyo t

Amarka (command) aad badanaa ku arki doonto aljebrada (algebra) waa:

Ka dhig s mawduuca (subject) qaacidada (formula).

$$d = s \times t$$

Hawlgalka (operation) rogaalka (inverse) si loo go'doomiyo s

$$\frac{d}{t} = s$$

Adigoo dib u habaynaya waxaan ka dhignay s mawduuca (subject) qaacidada (formula).

Beddelka mawduuca (subject) qaacidada (formula) fudud

Ka dhig x mawduuca (subject):

$$x + y = 10$$

$$x + y + (-y) = 10 + (-y)$$

$$x = 10 - y$$

Ka dhig m mawduuca (subject):

$$F = m \times a$$

$$F \div a = m \times a \div a$$

$$\frac{F}{a} = m$$

Beddelidda mawduuca (subject) ee qaaciddada (formula) fudud

Ka dhig x mawduuca (subject):

$$x + y = 10$$

$$x + y + (-y) = 10 + (-y)$$

$$x = 10 - y$$

Ka dhig m mawduuca (subject):

$$F = m \times a$$

$$F \div a = m \times a \div a$$

$$\frac{F}{a} = m$$

Ka dhig y mawduuca (subject):

$$x + y = 8$$

$$x + y + (-x) = 8 + (-x)$$

$$y = 8 - x$$

Ka dhig l mawduuca (subject):

$$A = l \times w$$

$$A \div w = l \times w \div w$$

$$\frac{A}{w} = l$$

1) Isla'eg/isla'egta (equation/formula) kasta, beddel mawduuca (subject) sida lagu amray.

a) Ka dhig x mawduuca (subject).

$$x - 2.7 = 8.1$$

b) Ka dhig l mawduuca (subject).

$$P = 3l$$

c) Ka dhig y mawduuca (subject).

$$17 - y = 4$$

d) Ka dhig w mawduuca (subject).

$$A = l \times w$$

e) Ka dhig u mawduuca (subject).

$$v = u + at$$

f) Ka dhig r mawduuca (subject).

$$C = 2\pi r$$

2) Dib u habeey (Rearrange) qaaciddadan (formula) sida lagu amray.

$$F - E + V = 2$$

a) Ka dhig F mawduuca (subject).

b) Ka dhig V mawduuca (subject).

c) Ka dhig E mawduuca (subject).

1) Isla'eg/isla'egta (equation/formula) kasta, beddel mawduuca (subject) sida lagu amray.

a) Ka dhig x mawduuca.

$$x - 2.7 = 8.1$$

$$x - 2.7 + 2.7 = 8.1 + 2.7$$

$$x = 8.1 + 2.7$$

$$x = 10.8$$

b) Ka dhig l mawduuca.

$$P = 3l$$

$$P \div 3 = 3l \div 3$$

$$\frac{P}{3} = l$$

1) Isla'eg/kacsi kasta beddel mawduuca sida lagu amray.

c) Ka dhig y mawduuca.

$$17 - y = 4$$

$$17 - y + y = 4 + y$$

$$17 = 4 + y$$

$$17 - 4 = 4 + y - 4$$

$$17 - 4 = y$$

$$13 = y$$

d) Ka dhig w mawduuca.

$$A = l \times w$$

$$A \div l = l \times w \div l$$

$$\frac{A}{l} = w$$

1) Isla'eg/kacsi kasta beddel mawduuca sida lagu amray.

c) Ka dhig y mawduuca.

$$17 - y = 4$$

$$17 - y + y = 4 + y$$

$$17 = 4 + y$$

$$17 - 4 = 4 + y - 4$$

$$17 - 4 = y$$

$$13 = y$$

Markaad si badan ku tababarto waxaad awoodi doontaa inaad si degdeg ah u aragto qoyska dib-u-habaynta markaad aragto isla'eg qaabkan.

$$\begin{array}{ll} 17 - y = 4 & 4 + y = 17 \\ 17 - 4 = y & y + 4 = 17 \end{array}$$

Ogsoonow 4 iyo y ayaa isweydaarsaday meelaha.

1) Isla'eg/kacsi kasta beddel mawduuca sida lagu amray.

e) Ka dhig u mawduuca.

$$v = u + at$$

$$v - at = u + at - at$$

$$v - at = u$$

f) Ka dhig r mawduuca.

$$C = 2\pi r$$

$$C \div 2\pi = 2\pi r \div 2\pi$$

$$\frac{C}{2\pi} = r$$

2) Dib u habayn qaacidadan sida lagu amray.

$$F - E + V = 2$$

a) Ka dhig F mawduuca.

$$F - E + V = 2$$

$$F - E + V + E - V = 2 + E - V$$

$$F = 2 + E - V$$

b) Ka dhig V mawduuca.

$$F - E + V = 2$$

$$F - E + V + E - F = 2 + E - F$$

$$V = 2 + E - F$$

c) E ka dhig mawduuca (subject).

2) Dib u habeey qaacidadaan (formula) sida lagu amray.

$$F - E + V = 2$$

a) F ka dhig mawduuca (subject).

$$F = 2 + E - V$$

b) V ka dhig mawduuca (subject).

$$V = 2 + E - F$$

c) E ka dhig mawduuca (subject).

$$F - E + V = 2$$

$$F - E + V + E = 2 + E$$

$$F + V = 2 + E$$

$$F + V - 2 = 2 + E - 2$$

$$F + V - 2 = E$$

Soo koobid

Bedelida mawduuca (subject) ee qaacidada (formula) fudud

Waxaan ku dabaqi karnaa hawlgallo rogaal (inverse operations) qaacidada (formula) fudud si aan uga dhigno doorsoome (variable) gaar ah mawduuca (subject).

Tusaale ahaan, qaacidadan d waa mawduuca (subject).

$$d = s \times t$$

Rogaalka $\times$ s wuxuu ka dhigi doonaa t mawduuca (subject).

$$d \div s = s \times t \div s$$

Waxaa jiri doona waqtiyo ay tani runtii faa'iido u yeelan doonto.

$$\frac{d}{s} = t$$