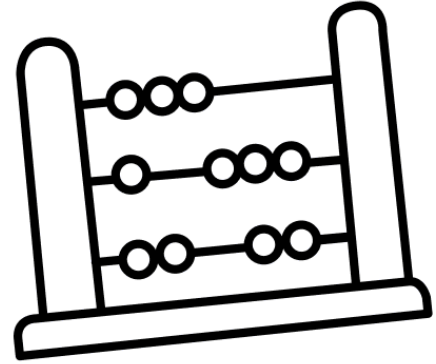


Xiriirro isku dhufasho (Multiplicative) oo u dhexeeya ereyada



Maths

Cutub: Tibaaxaha (Expressions) iyo qaaciidooyinka (Formulae)

Natiijo

Waxaan qiimeyn karaa in xiriir isku dhufasho (Multiplicative) oo u dhexeeya doorsoomayaasha (Variables) loo qori karo siyaabo kala duwan.

Erayada muhiimka ah

Isla'eg (Equation) waxaa loo isticmaalaa in lagu muujiyo laba tibaaxood oo isla eg.

Wax soo saar (Product) aljebrada (Algebra) waa natijada laba ama in ka badan oo erey ah oo la isku dhuftey.

Xiriirro isku dhufasho (Multiplicative)

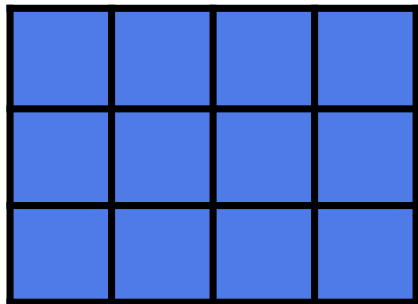


Qaab dhismeedka xiriirrada isku dhufashada (Multiplicative)



Dib u habeynta xiriirrada isku dhufashada (Multiplicative)

Tani waa sawir muujinaya $4 \times 3 = 12$



$$4 \times 3 = 12$$

$$3 \times 4 = 12$$

Isweydaarsiga (Commutativity)
ee isku dhufashada.

$$12 \div 3 = 4$$

Ka soo noqoshada
(Inverse) $\times 3$ waa $\div 3$

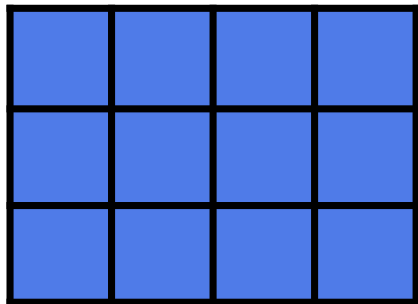
$$12 \div 4 = 3$$

Ka soo noqoshada
(Inverse) $\times 4$ waa $\div 4$

Waa maxay xaqiiqooyinka kale ee ay noo tusinaysaa?

Waxaa laga yaabaa inaad maqashay tan oo loo yaqaan 'Qoyska Xaqiiqda' (Fact Family).

Waxaa laga yaabaa inaad maqashay tan oo loo yaqaan 'Qoyska Xaqiiqda' (Fact Family).



$$4 \times 3 = 12$$

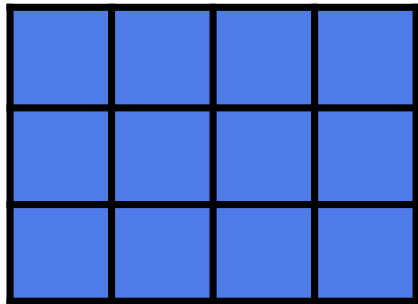
$$12 \div 3 = 4$$

$$3 \times 4 = 12$$

$$12 \div 4 = 3$$

Waxaad sidoo kale ugu yeeri kartaa qoyska dib-u-habaynta xiriirka isku dhufashada (Multiplicative) $4 \times 3 = 12$

Waxaa laga yaabaa inaad maqashay tan oo loo yaqaan 'Qoyska Xaqiiqda' (Fact Family).



$$4 \times 3 = 12$$

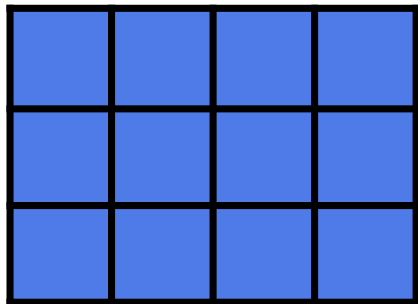
$$12 \div 3 = 4$$

$$3 \times 4 = 12$$

$$12 \div 4 = 3$$

Aljebrada (Algebra) kuma aragtid xaqiiqooyinka qaybinta (Division) oo sidan loo qoray.

Waxaa laga yaabaa inaad maqashay tan oo loogu yeero 'Qoyska Xaqiiqda (Fact Family)'.



$$4 \times 3 = 12$$

$$3 \times 4 = 12$$

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

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

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

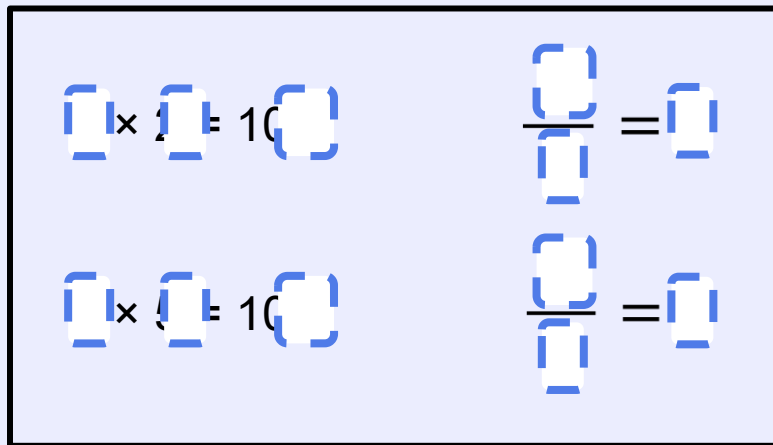
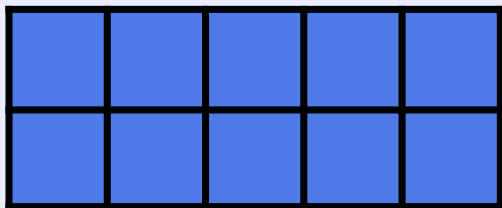
Xisaabta (algebra) waxaad arki doontaa xaqiiqooyin qaybin (division) oo lagu qoray xariiq jajab (fraction bar).

Waxaan isticmaaleynaa guud ahaan (generalisation):

$$a \div b = \frac{a}{b}$$

Qaabka xiriirka isku dhufashada (multiplicative relationships)

Dhammeystir qoyskan dib-u-habaynta (rearrangements) xiriirka isku dhufashada (multiplicative relationship) aad halkan ku aragto.



Aynu tixgelinno qaabka qoyskan.

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

Markaan isku dhufano laba tiro (multiply two numbers) waxaan dhihi karnaa...

$5 \times 2 = 10$

qaybiye (factor) $\times$ qaybiye (factor) $=$ **wax soo saar (product)**

Aynu tixgelinno qaabka qoyskan.

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

**wax soo saar
(product)**

qaybiye 2 (factor
2)

= qaybiye 1 (factor
1)

**wax soo saar
(product)**

qaybiye 1 (factor
1)

= qodax 2

Markaan isku dhufano laba tiro (multiply two numbers) waxaan dhihi karnaa...

$5 \times 2 = 10$

qaybiye 1 (factor 1) $\times$ qaybiye 2 (factor 2) = **wax soo saar (product)**

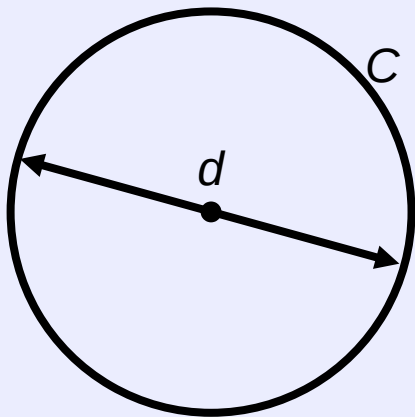
Tani waxay noo ogolaaneysaa inaan guud ahaan (generalise) qaacido.

$$\begin{array}{ll} a \times b = c & \frac{c}{b} = a \\ b \times a = c & \frac{c}{a} = b \end{array}$$

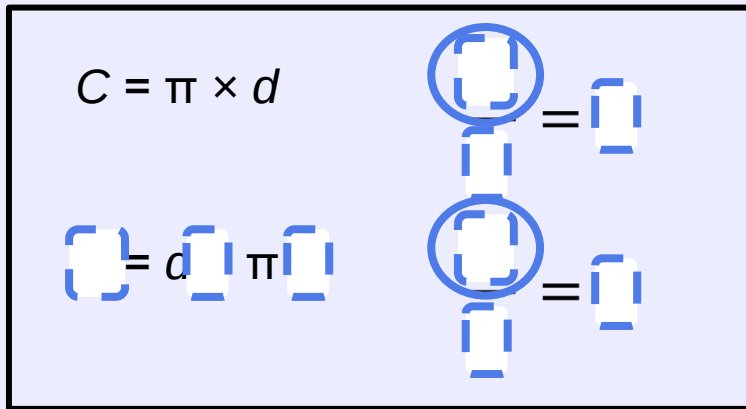
Guud ahaan (generalisation) dib-u-habaynta xiriirka isku dhufashada (multiplicative relationships).

a, b, iyo c waxay qaadan karaan qaab kasta oo erey ah, ha ahaado tiro ama doorsoome aljabri (algebraic variable).

Dhammeystir qoyska dib-u-habaynta ee xiriirkan isku dhufashada.



Wareegga (Circumference) = $\pi \times$ dhexroorka (diameter)

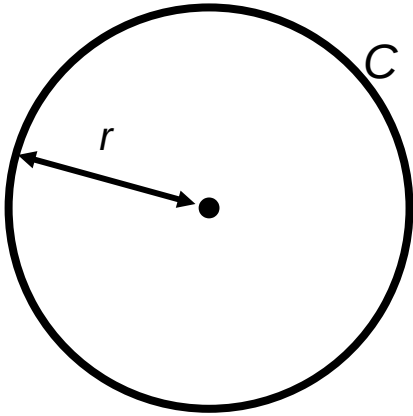


The diagram shows the formula $C = \pi \times d$ being rearranged to solve for C . The steps are as follows:

- Start with the formula: $C = \pi \times d$
- Divide both sides by π : $\frac{C}{\pi} = d$
- Multiply both sides by π to isolate C : $C = d \times \pi$

Ogsoonow in labada dib-u-habayn 'qaybin' (division) C , tirada sare (numerator), ay tahay wax soo saarka xiriirka isku dhufashada asalka ah.

Mararka qaarkood waxaan u baahan doonnaa inaan tixgelinno wax soo saarka laba erey oo ah erey marka dib-u-habayn sameynayno.



$$\text{Wareegga} = 2 \times \pi \times \text{gacan (radius)}$$

$$C = 2\pi r$$

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

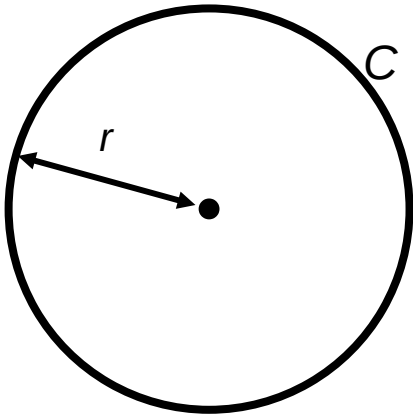
$$C \div \pi = 2r$$

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

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

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

Mararka qaarkood waxaan u baahan doonnaa inaan tixgelinno wax soo saarka laba erey oo ah erey marka dib-u-habayn sameynayno.



$$\text{Wareegga} = 2 \times \pi \times \text{gacan}$$

$$C = 2\pi r$$

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

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

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

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

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

$$C = 2\pi r$$

$$C = r \times 2\pi$$

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

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

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

Tani waa mid waxtar badan.

Dib-u-habayn kale oo qoyskan ka mid ah waa kee?

a $\frac{r}{2\pi} = C$ ✗

b $\frac{C}{2r} = \pi$ ✓

c $\frac{2}{C} = \pi r$ ✗

$$C = 2\pi r$$

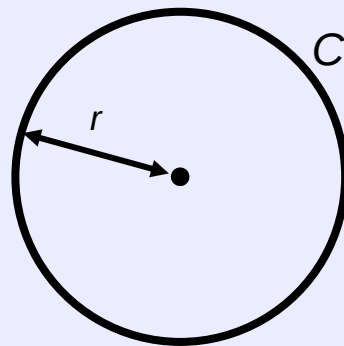
$$C = \pi \times 2r$$

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

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

$$C = 2\pi r$$

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



Ogsoonow labada dib-u-habayn saxda ah in C, tirada sare, ay tahay wax soo saarka xiriirka isku dhufashada asalka ah.

1) Qor qoyska dib-u-habaynta ee isla'egyada hoose.

a)

$$12 \times 7 = 84$$

$$\boxed{} \times 1 \boxed{} 84 \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

b)

$$0.3 \times 2.7 = 0.81$$

$$\boxed{} \times 0. \boxed{} 0.81 \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

c)

$$7 \times y = 3$$

$$\boxed{} \times 1 \boxed{} 3 \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

d)

$$d = s \times t$$

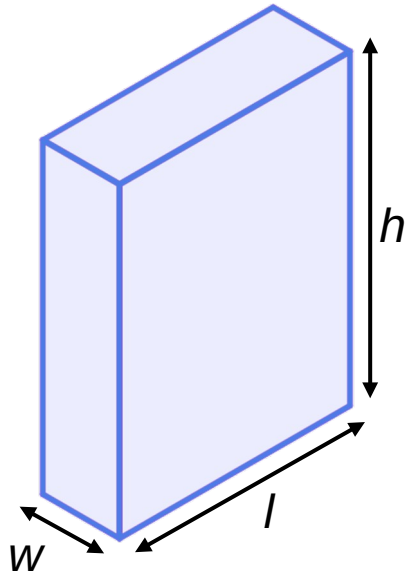
$$\boxed{} = \boxed{} s \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

2) Mugga (volume) cuboid waxaa lagu xisaabin karaa 'dhererka $\times$ ballaca $\times$ joogga'

Buuxi qaybaha maqan ee dib-u-habayntan.



$$V = lwh$$

$$\frac{V}{\boxed{}} = lw$$

$$\frac{V}{w} = \boxed{}$$

$$\frac{V}{\boxed{}} = h$$

$$\frac{V}{wh} = \boxed{}$$

1) Qor qoyska dib-u-habaynta ee isla'egyada hoose.

a)

$$12 \times 7 = 84$$

$$\boxed{} \times 1 \boxed{} 84 \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

b)

$$0.3 \times 2.7 = 0.81$$

$$\boxed{} \times 0. \boxed{} 0.81 \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

c)

$$7 \times y = 3$$

$$\boxed{} \times 1 \boxed{} 3 \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

d)

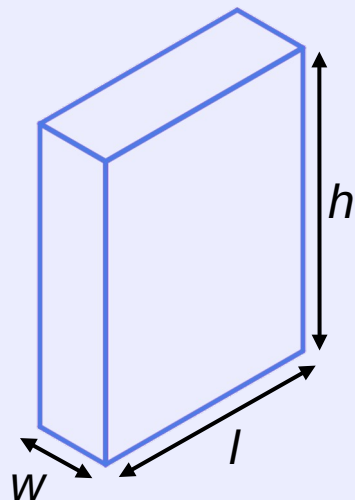
$$d = s \times t$$

$$\boxed{} = \boxed{} s \boxed{}$$

$$\boxed{} = \boxed{}$$

$$\boxed{} = \boxed{}$$

2) Mugga (volume) cuboid-ka waxaa loo xisaabin karaa 'dherer × ballac × joog'



Buuxi qaybaha maqan ee dib-u-habayntan.

$$V = lwh$$

V, soosaarka (product) xiriirkii asalka ahaa ee isku dhufashada, ayaa ku sii hadhay tireeyaha (numerator).

$$\frac{V}{\boxed{}} = lw$$

$$\frac{V}{w} = \boxed{}$$

$$\frac{V}{\boxed{}} = h$$

$$\frac{V}{wh} = \boxed{}$$

Qaabka casharka

Xiriirka isku dhufashada (multiplicative relationships)

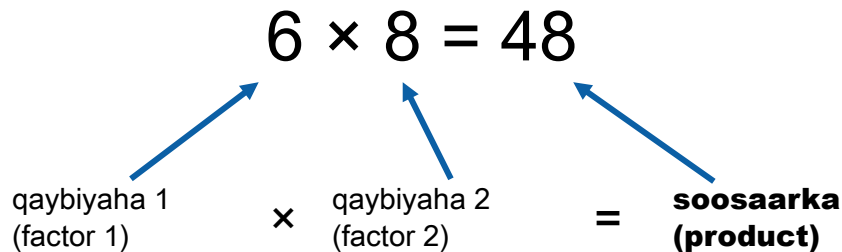


Qaabka xiriirka isku dhufashada (multiplicative relationships)



Dib-u-habaynta xiriirka isku dhufashada (multiplicative relationships)

Xiriirka isku dhufashada (multiplicative relationships) wuxuu ka kooban yahay:



Waxaan dib u habaynaynaa marka hore anagoo beddelaya (commuting)...

Kadibna anagoo samaynayna rogaal celinta (inverse) isku dhufashada.

$$6 \times 8 = 48$$

$$6 \times 8 = 48$$

$$8 \times 6 = 48$$

$$6 \times 8 \div 8 = 48 \div 8$$

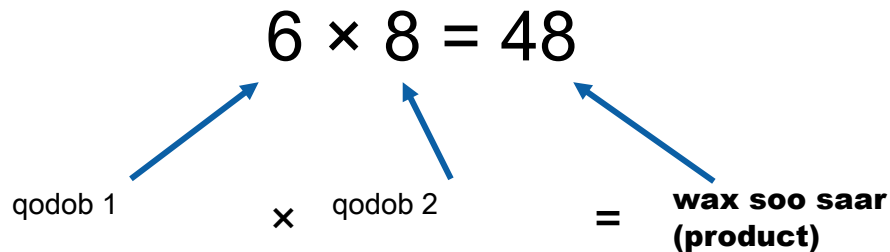
$$8 \times 6 \div 6 = 48 \div 6$$

$$8 \times 6 = 48$$

$$6 = 48 \div 8$$

$$8 = 48 \div 6$$

Xiriirka isku dhufashada (multiplicative relationships) wuxuu ka kooban yahay:



Waxaan dib u habeynay marka hore isku beddel...

Kadibna adoo sameynaya rogaal celinta isku dhufashada.

$$6 \times 8 = 48$$

$$6 \times 8 = 48$$

$$8 \times 6 = 48$$

$$8 \times 6 = 48$$

$$6 \times 8 \div 8 = 48 \div 8$$

$$8 \times 6 \div 6 = 48 \div 6$$

$$6 = \frac{48}{8}$$

$$8 = \frac{48}{6}$$

Xiriirrada isku dhufashada (multiplicative) waxay ka kooban yihiin:

$$6 \times 8 = 48$$

Diagram illustrating the components of the multiplication equation $6 \times 8 = 48$:

- 6 is labeled "qodob 1" (Factor 1).
- $\times$ is the multiplication symbol.
- 8 is labeled "qodob 2" (Factor 2).
- $=$ is the equals sign.
- 48 is labeled "wax soo saar (product)" (Product).

Waxaan dib u habeynay marka hore isku beddel...

Kadibna adoo sameynaya rogaal celinta isku dhufashada.

$$6 \times 8 = 48$$

Ogsoonow in wax soo saarka (product) uu ku xidhan yahay booska tirada sare (numerator). Qodobadu waxay beddelaan boosaska.

$$8 \times 6 = 48$$

$$6 = \frac{48}{8}$$

$$8 = \frac{48}{6}$$

Dib u habeynta xiriirrada isku dhufashada

Mararka qaarkood waa inaan dib u habeynaa min 'wax soo saar (product) korka qodob'.

Tusaale ahaan, dib u habeyn $\frac{10}{2} = 5$

Waxaa jira siyaabo badan oo loo tixgeliyo.

$$\frac{10}{2} = 5$$

$$10 \div 2 = 5$$

$$10 \div 2 \times 2 = 5 \times 2$$

$$10 = 5 \times 2$$

$$\frac{10}{2} = 5$$

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

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

$$10 = 5 \times 2$$

Nuska 10 waa 5

Nuska 10 waa 5

Ku dhufo rogaal celinta nuska (reciprocal)

Dib u habeynta xiriirrada isku dhufashada

Mararka qaarkood waa inaan dib u habeynaa min 'wax soo saar (product) korka qodob'.

Tusaale ahaan, Dib-u-habayn
(Rearrange)

$$\frac{10}{2} = 5$$

Waxaa jira siyaabo badan oo looga fikiri karo tan.

$$10 = 2 \times 5$$

$$\frac{10}{5} = 2$$

Dhammaan afarta dib-u-habayn.

$$\frac{10}{2} = 5$$

Nus 10 waa 5

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

Nus 10 waa 5

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

Ku dhufo isdhaafsigu (reciprocal)
nus

$$10 = 5 \times 2$$

Dib-u-habaynta xiriirrada isku dhufashada (multiplicative relationships)

Dib-u-habaynta 'wax soo saar (product) korka qaybiye (factor)' oo leh doorsoomayaal aljabra (algebraic variables) isku mid bay tahay.

Tusaale ahaan, Dib-u-habayn
(Rearrange)

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

$$d \times \frac{1}{t} = s$$

$$d \times \frac{1}{t} \times t = s \times t$$

$$d = s \times t$$

$$\frac{10}{2} = 5$$

Nus 10 waa 5

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

Nus 10 waa 5

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

Ku dhufo isdhaafsigu (reciprocal)
nus

$$10 = 5 \times 2$$

Dib-u-habaynta xiriirrada isku dhufashada (multiplicative relationships)

Dib-u-habaynta 'wax soo saar (product) korka qaybiye (factor)' oo leh doorsoomayaal aljabra (algebraic variables) isku mid bay tahay.

Tusaale ahaan, Dib-u-habayn
(Rearrange)

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

$$d \times \frac{1}{t} = s$$

$$d \times \frac{1}{t} \times t = s \times t$$

$$d = s \times t$$

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

Mar kale, wax soo saarka (product) wuxuu ku xidhan yahay booska tireeyaha (numerator). Qaybiyeyaashu (factors) waxay beddelaan boosaska.

$$d = t \times s$$

Kee mid ka mid ah kuwani waa habaynta saxda ah ee isla'egtan?

$$d = \frac{m}{V}$$

a $d = V \times \frac{1}{m}$ ✗ $d = \frac{V}{m}$

b $d = m \times \frac{1}{V}$ ✓ $d = \frac{m}{V}$

c $d = m \times \frac{m}{V}$ ✗ $d = \frac{m^2}{V}$

Dib-u-habaynta xiriirrada isku dhufashada (multiplicative relationships)

Dib-u-habaynta 'wax soo saar (product) korka qaybiye (factor)' oo leh ereyo badan oo la isku daray sida hal erey isku mid bay tahay.

Tusaale ahaan, Dib-u-habayn
(Rearrange)

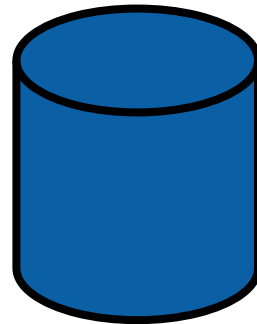
$$\frac{V}{\pi r^2} = h$$

$$V \times \frac{1}{\pi r^2} = h$$

$$V \times \frac{1}{\pi r^2} \times \pi r^2 = h \times \pi r^2$$

$$V = \pi r^2 h$$

$$V = \pi r^2 h$$



Dib-u-habaynta xiriirrada isku dhufashada (multiplicative relationships)

Mid ka mid ah kuwani waa tillaabada koowaad ee dib-u-habaynta isla'egtan?

$$\frac{7}{xy^3} = 5$$

a $7 \times \frac{1}{xy^3} = 5$ ✓

b $xy^3 \times \frac{1}{7} = 5$ ✗

c $1 \times \frac{xy^3}{7} = 5$ ✗

Dib-u-habaynta xiriirka isku dhufashada (multiplicative relationships)

Waa maxay tillaabada xigta ee dib-u-habaynta isla'egtan?

a $\div xy^3$ labada dhinacba. 

b $\times xy^3$ labada dhinacba. 

c $\times xy^3$ dhinaca LHS kaliya. 

$$\frac{7}{xy^3} = 5$$

$$7 \times \frac{1}{xy^3} = 5$$

Ku dhufo labada dhinac isku-dhufashada (reciprocal) xy^3

Waa maxay dib-u-habaynta kama dambaysta ah?

a $5 = 7xy^3$ 

b $7 = 5 \times xy^3$  Si buuxda looma fududeyn

c $7 = 5xy^3$ 

$$\frac{7}{xy^3} = 5$$

$$7 \times \frac{1}{xy^3} = 5$$

$$7 \times \frac{1}{xy^3} \times xy^3 = 5 \times xy^3$$

Dib-u-habaynta xiriirka isku dhufashada (multiplicative relationships)

Waa maxay dib-u-habaynta kama dambaysta ah?

$$\frac{7}{xy^3} = 5$$

$$7 = 5xy^3$$

Marka aad noqoto mid aad u kalsoon, waxaad samayn kartaa hal tallaabo oo degdeg ah, $\times xy^3$

a $5 = 7xy^3$ 

b $7 = 5 \times xy^3$ 

c $7 = 5xy^3$ 

1) Qor qoyska dib-u-habaynta isla'egyada hoose.

a)

$$\boxed{} \times 5 \boxed{} 95 \boxed{} \quad \frac{95}{5} = 19$$

$$\boxed{} \times 1 \boxed{} 95 \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

b)

$$\boxed{} \times 4. \boxed{} 0.82 \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

$$\boxed{} \times 0. \boxed{} 0.82 \boxed{} \quad \frac{0.82}{0.2} = 4.1$$

c)

$$\boxed{} \times y \boxed{} 56 \boxed{} \quad \frac{56}{y} = 7$$

$$\boxed{} \times \boxed{} 56 \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

d)

$$\boxed{} = F \boxed{} A \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

$$\boxed{} = A \boxed{} F \boxed{} \quad \frac{P}{F} = A$$

2) Cabdi wuxuu dib u habaynayaa isla'egyada.

a) $\frac{72}{9} = 8$ waxaa loo beddeli karaa $\frac{72}{8} = 9$

Waxaan kaliya 'beddelaa boosaska' isla'egta dhexdeeda.

b) $\frac{5}{h} = b$ waxaa loo beddeli karaa $\frac{5}{b} = h$



c) $\frac{13}{x} = 2$ waxaa loo beddeli karaa $\frac{2}{x} = 13$

Xaalad kasta, go'aami haddii Cabdi sax yahay oo qor jumlad ku caddaynaysa go'aankaaga.

a) $\frac{x}{8} = y$

b) $\frac{x}{3y} = y$

c) $\frac{5x}{3yz} = 4z^2$

1) Qor qoyska dib-u-habaynta isla'egyada hoose.

a)

$$\boxed{} \times 5 \boxed{} 95 \boxed{} \quad \frac{95}{5} = 19$$

$$\boxed{} \times 1 \boxed{} 95 \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

b)

$$\boxed{} \times 4. \boxed{} 0.82 \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

$$\boxed{} \times 0. \boxed{} 0.82 \boxed{} \quad \frac{0.82}{0.2} = 4.1$$

c)

$$\boxed{} \times y \boxed{} 56 \boxed{} \quad \frac{56}{y} = 7$$

$$\boxed{} \times 7 \boxed{} 56 \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

d)

$$\boxed{} = F \boxed{} A \boxed{} \quad \frac{\boxed{}}{\boxed{}} = \boxed{}$$

$$\boxed{} = A \boxed{} F \boxed{} \quad \frac{P}{F} = A$$

2) Cabdi wuxuu dib u habaynayaa isla'egyada.

a) $\frac{72}{9} = 8$ waxaa loo beddeli karaa $\frac{72}{8} = 9$ ✓

Labaduba waa dib-u-habayn $8 \times 9 = 72$ halkaas oo 72 uu yahay badeecada (product).

b) $\frac{5}{h} = b$ waxaa loo beddeli karaa $\frac{5}{b} = h$



c) $\frac{13}{x} = 2$ waxaa loo beddeli karaa $\frac{2}{x} = 13$

Xaalad kasta, go'aami haddii Cabdi sax yahay oo qor jumlad ku caddaynaysa go'aankaaga.

2) Cabdi wuxuu dib u habeynayaa isla'egyada.

a) $\frac{72}{9} = 8$ waxaa loo beddeli karaa $\frac{72}{8} = 9$ ✓

Labaduba waa dib u habayn $8 \times 9 = 72$ halkaas oo 72 uu yahay natijada (product).

b) $\frac{5}{h} = b$ waxaa loo beddeli karaa $\frac{5}{b} = h$ ✓

Labaduba waa dib u habayn $bh = 5$ halkaas oo 5 uu yahay natijada (product).

c) $\frac{13}{x} = 2$ waxaa loo beddeli karaa $\frac{2}{x} = 13$ ✗

Mid waa dib u habayn $2x = 13$, kan kalena waa dib u habayn $13x = 2$

Waxaa laga yaabaa inaad qortay talo Cabdi:

Waa muhiim in si sax ah loo dib u habeeyo isla'egyada.

Ma aha oo kaliya in la beddelo boosaska ereyada.

Waxaan kaliya 'beddelaa boosaska'
isla'egta.



3) Dib u habeey isla'eg kasta qaab $a \times b = c$

a) $\frac{x}{8} = y$

$$x \times \frac{1}{8} = y$$

$$x \times \frac{1}{8} \times 8 = y \times 8$$

$$x = 8y$$

b) $\frac{x}{3y} = y$

$$x \times \frac{1}{3y} = y$$

$$x \times \frac{1}{3y} \times 3y = y \times 3y$$

$$x = 3y^2$$

c) $\frac{5x}{3yz} = 4z^2$

$$\frac{5x}{3yz} \times 3yz = 4z^2 \times 3yz$$

$$5x = 12yz^3$$

Xiriirka isku dhufashada (multiplicative relationships) ee u dhexeeya doorsoomayaasha waxaa loo qori karaa siyaabo kala duwan.

Tusaale ahaan, isla'egta waxaan ka heli karnaa $\frac{15}{c} = d$ ooys dib u habayn ah.

$$\frac{15}{c} = d$$

$$15 = c \times d$$

$$\frac{15}{d} = c$$

$$15 = d \times c$$