Rearranging Fractions

Did you know?

Comparing Fractions

To order fractions you can compare the product of their diagonals

Compare these two fractions $\frac{5}{12}$ and $\frac{6}{13}$

5 x 13 = 65 6 x 12 = 72

$\frac{5}{12}$ $\frac{6}{13}$

as 72 > 65 then $\frac{6}{13}$ is larger than $\frac{5}{12}$

Compare these two fractions $\frac{42}{98}$ and $\frac{12}{28}$

42 x 28 = 1176 98 x 12 = 1176

$\frac{42}{98}$ $\frac{12}{28}$

This means $\frac{42}{98} = \frac{12}{28}$ so are **equivalent** fractions

If fractions are equivalent then the product of their diagonals will always be equal!

How could you use this to help you when rearranging or solving equations involving fractions?

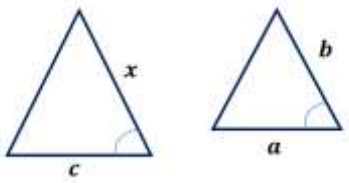
Fractions 1

1. Rewrite the formula to make time the subject
$$Speed = \frac{distance}{time}$$

2. Rearrange to make a the subject
$$\frac{x}{y} = \frac{a}{b}$$

3. Make x the subject of $tan\theta = \frac{y}{x}$

4. These triangles are similar.
Show that $x = \frac{cb}{a}$



5. Make x the subject of $x = \frac{h+k}{a}$

6. Make x the subject of $x + a = \frac{x+b}{c}$

7. Make a the subject of $\frac{1-a}{1+a} = \frac{x}{y}$

8. Make y the subject of $y(\sqrt{3} + \sqrt{2}) = x$
And write in the form $y = x(\sqrt{a} + \sqrt{b})$

Fractions 2

1. Make x the subject of $bc = \frac{x}{a}$

2. Make e the subject of $x = \frac{y}{e^2}$

3. Write a in terms of x, y, z and b.
$\frac{b-xa}{z} = y$

4. Make v the subject $C = \frac{v^2-ta}{x}$

5. Rearrange to make x the subject of
$$\frac{2}{x} + 5 = 6y$$

6. Make x the subject of
$$4F = F + \frac{a}{y+x}$$

7. Make y the subject of
$$\sqrt{\frac{m(y+a)}{y}} = y$$

8. A cylinder has a radius 3 cm and height h cm. The total surface area is $30x\ cm^2$
Find an expression for surface area and write h in terms of x and π

Wrong Steps

Each expression has been written in different ways

- Which are not correct rearrangements?
- Can you explain what's gone wrong?

$c = \frac{3e^2}{d}$	
A.	$d = 3e^2 - c$
B.	$cd = 3e^2$
C.	$\frac{d}{e^2} = \frac{c}{3}$
D.	$\frac{1}{3}c = \frac{e^2}{d}$
E.	$d = \frac{3e^2}{c}$

$\frac{sinx}{4} = \frac{siny}{a}$	
A.	$\frac{a}{4} = \frac{siny}{sinx}$
B.	$siny = \frac{4}{asinx}$
C.	$sinx = \frac{4siny}{a}$
D.	$asinx = 4siny$
E.	$a = \frac{sinx}{4siny}$

$\frac{T-a}{T+a} = \frac{x}{y}$	
A.	$x(T+a) = y(T-a)$
B.	$xy - ay = yT - ya$
C.	$a = \frac{y(T-a)}{x+y}$
D.	$xa + ya = yT - xT$
E.	$a = \frac{x+y}{yT-ya}$

$a - \frac{b^2}{d} = ce$	
A.	$b^2 = d(a + ce)$
B.	$a = ce + \frac{b^2}{d}$
C.	$\frac{b^2}{d} = a - ce$
D.	$\frac{b}{\sqrt{d}} = \sqrt{a} - \sqrt{ce}$
E.	$b = \pm\sqrt{d(a - ce)}$

$y + b = \frac{ay + e}{b}$	
A.	$by + b^2 = ay + e$
B.	$by - ay = e + b^2$
C.	$y = \frac{e-b^2}{b-a}$
D.	$e = b(y + b) - ay$
E.	$y(b - a) = \frac{e-b^2}{y}$

Prove it

Using your rearranging skills can you prove each of the following

If $\boldsymbol{a = \frac{b}{b+c}}$

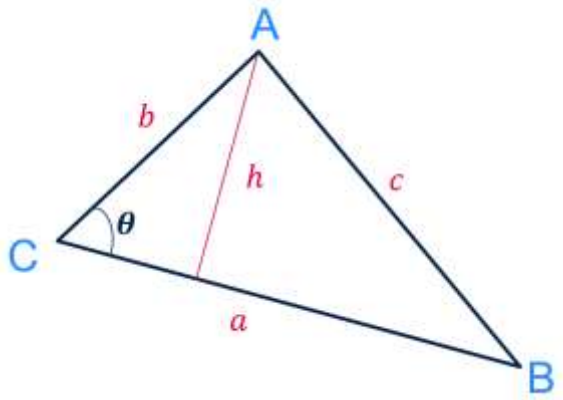
Show that $\boldsymbol{\frac{a}{1-a} = \frac{b}{c}}$

$\frac{n(n-1)}{2} + \frac{n(n+1)}{2}$ is a square number

$$\frac{2x+3}{4} - \frac{3x-2}{3} + \frac{1}{6} = \frac{19-6x}{12}$$

Missing Steps

Complete the steps and fill in the blanks to find an expression for the area of triangle ABC



1. On the diagram draw a perpendicular line from A to BC
2. Label the perpendicular line, h h
3. Find an expression for the perpendicular height, h

$$h =$$

Hint: you might want to use some trigonometry here

4. Write down the expression for the base of the triangle

$$base =$$

5. Write down an expression to find the area of this triangle using your expressions for $base$ and $perpendicular\ height$

$$area =$$