

PROPORTIONS AND SIMILAR TRIANGLES

Learning Goals:

- solve proportions
- solve similar triangles

What is a ratio?

comparison of 2 or more
things with the same unit

What is a proportion?

part of a whole
compared to other things

What does it mean for two fractions to be proportional?

two fractions are
equal to each other

Solve for the variable.

$$\frac{2}{5} = \frac{4}{x}$$

(Red arrows: top from 2 to 4 labeled $\times 2$, bottom from 5 to x labeled $\times 2$)

$$x = 10$$

$$\frac{5}{y} = \frac{10}{12}$$

(Red arrows: top from 5 to 10 labeled $\div 2$, bottom from y to 12 labeled $\div 2$)

$$y = 6$$

$$\frac{21}{30} = \frac{m}{10}$$

(Red arrows: top from 21 to m labeled $\div 3$, bottom from 30 to 10 labeled $\div 3$)

$$m = 7$$

cross multiply

$$\frac{5}{y} = \frac{10}{12}$$

(Green arrow from 5 to 12, red arrow from 10 to y)

$$5(12) = y(10)$$

$$60 = 10y$$

$$\frac{60}{10} = \frac{10y}{10}$$

$$6 = y$$

On the Boards...

$$\frac{2}{18} = \frac{b}{6}$$

$$18b = 12$$

$$b = \frac{12}{18}$$

$$b = \frac{2}{3}$$

$$\frac{5}{d} = \frac{4}{6}$$

$$4d = 30$$

$$d = \frac{30}{4}$$

$$d = \frac{15}{2}$$

$$\frac{u}{12} = \frac{25}{10}$$

$$10u = 300$$

$$u = 30$$

What are congruent figures?

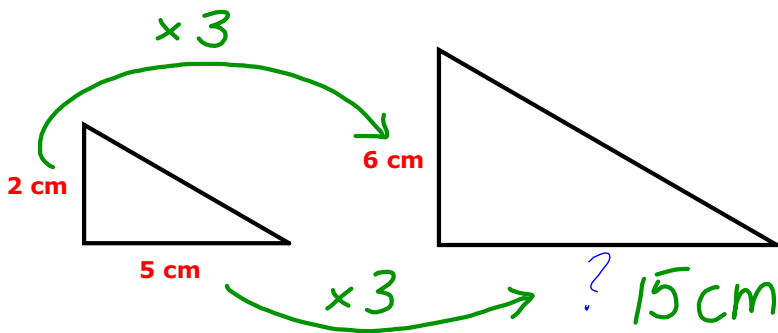
same shape

same size

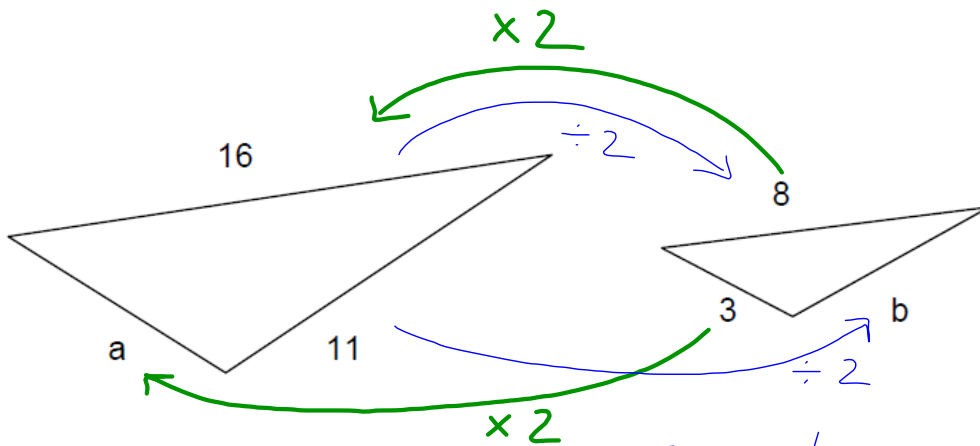
What are similar figures?

same shape

different size



1. Calculate the missing information for the following pairs of similar triangles.

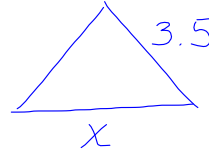
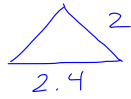
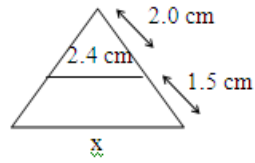


Find a
 $a = 3(2)$
 $a = 6$

Find b
 $b = \frac{11}{2}$

3C - 0 - day 4 - Similar Triangles and Proportions.notebook

The two triangles are similar. Determine the length represented by x.



small
big

$$\frac{2.4}{x} = \frac{2}{3.5}$$

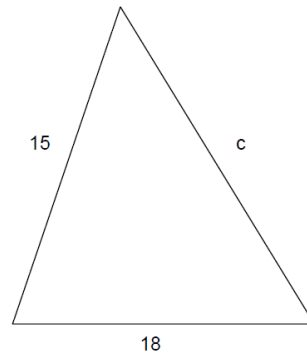
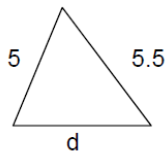
$$2.4(3.5) = 2x$$

$$\frac{8.4}{2} = \frac{2x}{2}$$

$$4.2 = x$$

On the Boards...

b)



$$\frac{5}{15} = \frac{5.5}{c}$$

$$5c = 82.5$$

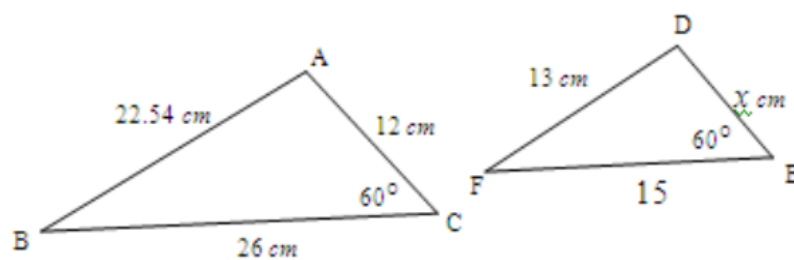
$$c = 16.5$$

$$\frac{5}{15} = \frac{d}{18}$$

$$15d = 90$$

$$d = 6$$

Solve for x in the similar triangles.



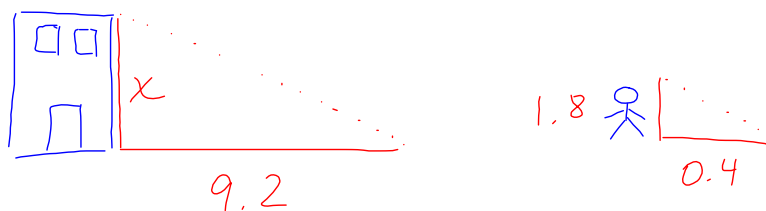
$$\frac{26}{15} = \frac{12}{x}$$

$$26x = 180$$

$$x = 6.92$$

A tall building casts a shadow 9.2 m long. At the same time, a 1.8 m tall person casts a shadow 0.4 m long. How tall is the building?

Hint: Draw a diagram



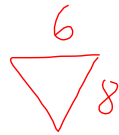
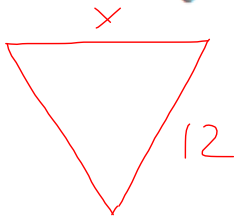
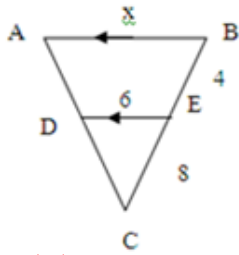
$$\frac{x}{1.8} = \frac{9.2}{0.4}$$

$$0.4x = 16.56$$

$$x = 41.4$$

$$\therefore 41.4 \text{ m}$$

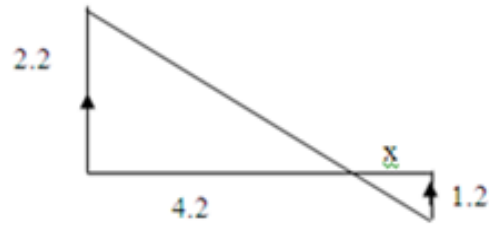
Find the value of x in the following two triangles:



$$\frac{x}{6} = \frac{12}{8}$$

$$8x = 72$$

$$x = 9$$



$$\frac{1.2}{2.2} = \frac{x}{4.2}$$

$$2.2x = 5.04$$

$$x = 2.29$$

Homework

Similar triangles
handout



Attachments

SolvingEquationsPart2Worksheet.pdf

Day2Worksheet.docx