Algebra 6-9: Similar Figures

Warm-Up

Solve.

1. $\frac{5m}{14} = \frac{6}{21}$ $6 \cdot 14 = 5m(21)$ $84 = 105m$ $\frac{84}{105} = \frac{105m}{105}$ $.8 = m$

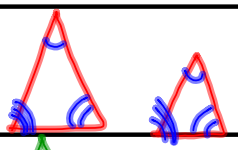
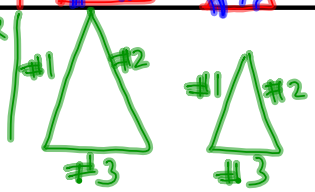
2. $\frac{1}{y+7} = \frac{8}{72}$ $1 \cdot 72 = (y+7)8$ $72 = 8y + 56$ $-56 \quad -56$ $\frac{16}{8} = \frac{8y}{8}$ $y = 2$

3. $\frac{c+12}{c+2} = \frac{6}{1}$ $6(c+2) = c+12$ $6c+12 = c+12$ $-c \quad -c$ $5c+12 = 12$ $-12 \quad -12$ $\frac{5c}{5} = \frac{0}{5}$ $c = 0$

4. $\frac{2e+9}{24} = \frac{e+1}{8}$ $8(2e+9) = 24(e+1)$ $16e+72 = 24e+24$ $-16e \quad -16e$ $72 = 8e+24$ $-24 \quad -24$ $\frac{48}{8} = \frac{8e}{8}$ $e = 6$

5. $\frac{-4}{5} = \frac{12}{a}$ $-4a = 5 \cdot 12$ $-4a = 60$ $\frac{-4a}{-4} = \frac{60}{-4}$ $a = -15$

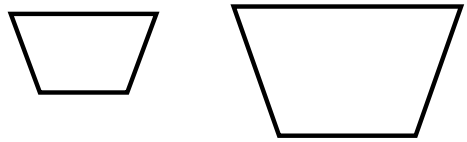
6. $\frac{3}{x} = \frac{x}{12}$ $x^2 = 36$ $x = \pm 6$ $x \cdot x = 36$ $6 \cdot 6 = 36$ $-6 \cdot -6 = 36$

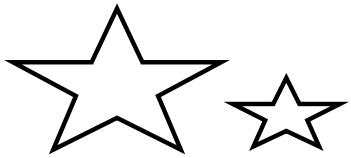
Vocab	Definition	Example
Corresponding Angles	Angles in the same relative position	
Corresponding Sides	Sides in the same relative position	

Same Shape, but not the same size

2 Requirements to be Similar Figures

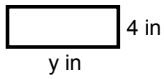
1. Corresponding angles must be equal
2. Corresponding sides are proportional





Examples

1. The 2 rectangles below are similar. Find the missing side length.



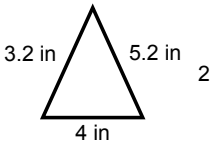
$\frac{6}{15} = \frac{4}{y}$ (right / bottom)

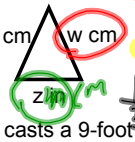
$15(4) = 6y$

$60 = 6y$

$10 = y$

2. The triangles below are similar. Find the missing side lengths.





$\frac{3.2}{4} = \frac{2}{z}$

$3.2z = 8$

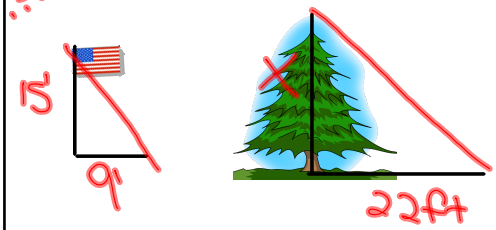
$z = 2.5$ cm

$\frac{3.2}{5.2} = \frac{2}{w}$

$3.2w = 10.4$

$w = 3.25$ cm

3. A 15-foot flagpole casts a 9-foot shadow. How tall is a tree that casts a 22-foot shadow at the same time of day?

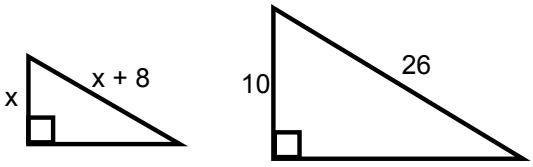


$\frac{15}{9} = \frac{x}{22}$

$9x = 330$

$x = 36.7$ ft

4. The triangles below are similar. Find x.



$\frac{x}{x+8} = \frac{10}{26}$

$26x = 10(x+8)$

$26x = 10x + 80$

$-10x \quad -10x$

$16x = 80$

$\frac{16x}{16} = \frac{80}{16}$

$x = 5$