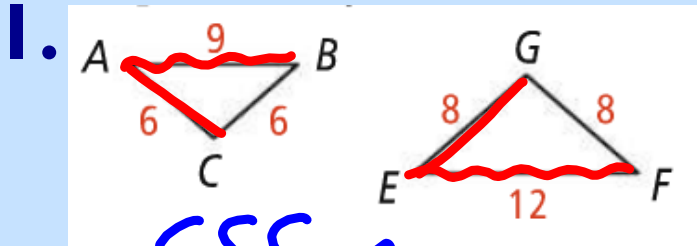


# 1/24/20 - Warm Up Problem

Is each pair of triangles similar? By SSS, SAS, or AA?

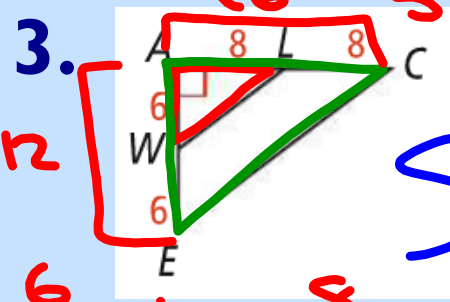


SSS ~

$$\frac{6}{8} = \frac{3}{4} \quad \frac{9}{12} = \frac{3}{4}$$



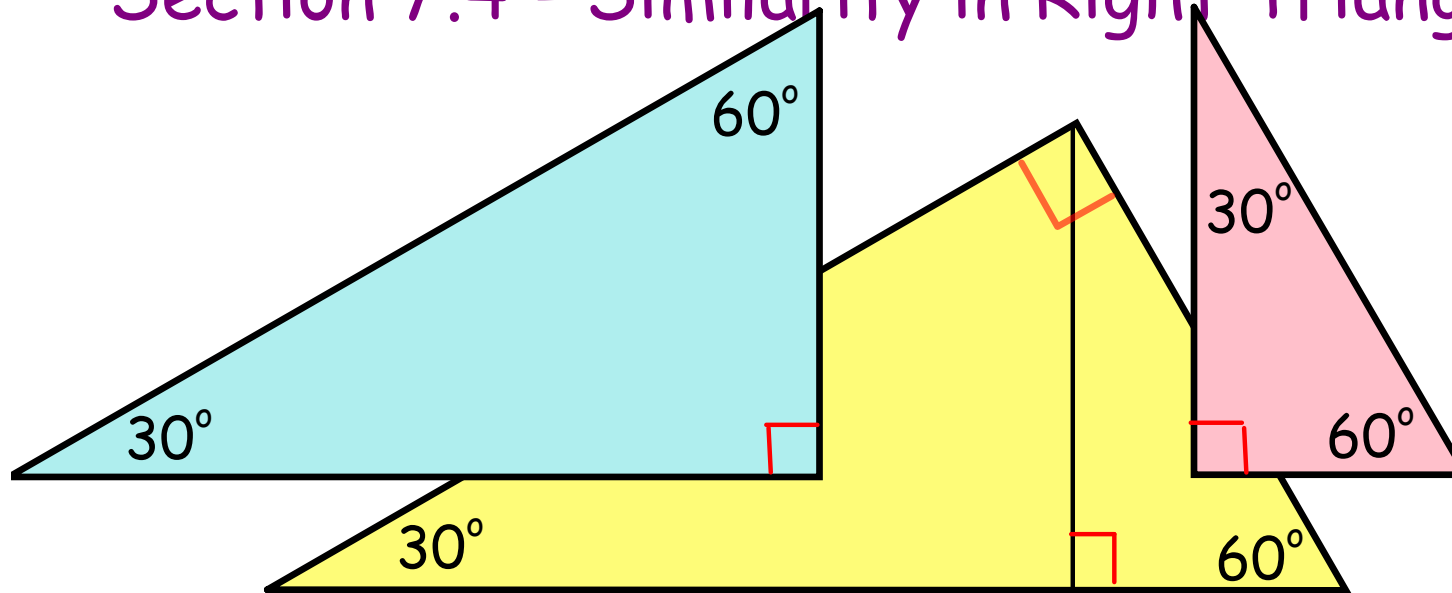
AA ~



SAS ~

$$\frac{6}{12} = \frac{1}{2} \quad \frac{8}{16} = \frac{1}{2}$$

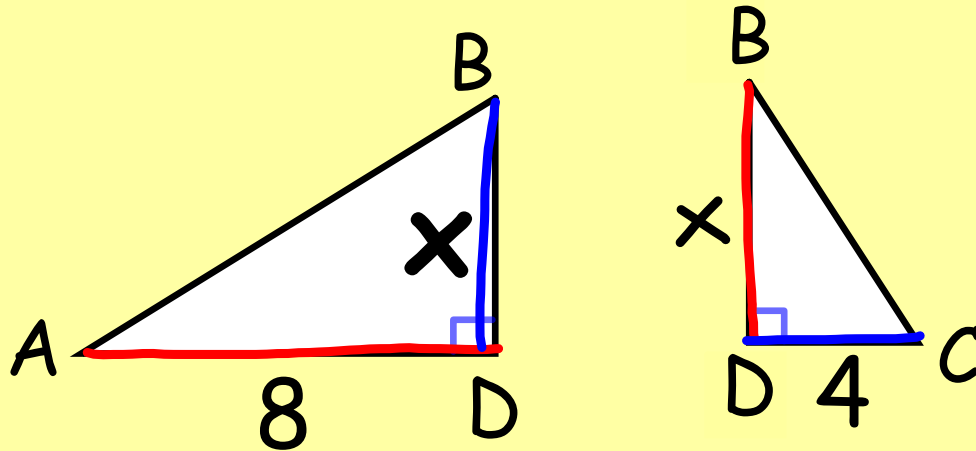
## Section 7.4 - Similarity in Right Triangles



### RIGHT TRIANGLE SIMILARITY THEOREM

The altitude to the hypotenuse of a right triangle divides the triangle into two triangles that are similar to each other and to the original triangle.

Write a proportion and cross multiply to find the value of  $x$ .



$$\frac{8}{x} = \frac{x}{4}$$

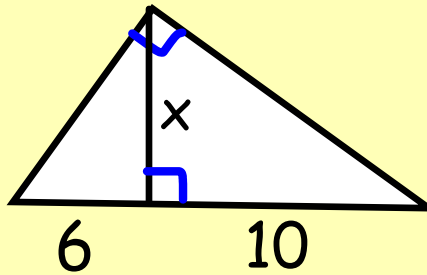
$$\sqrt{x^2} = \sqrt{32}$$

$$x = \sqrt{16 \cdot 2} = 4\sqrt{2}$$

**COROLLARY 1 TO RIGHT TRIANGLE SIMILARITY THEOREM**

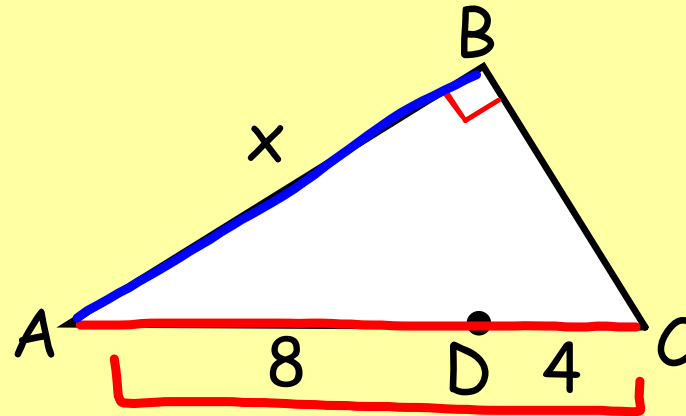
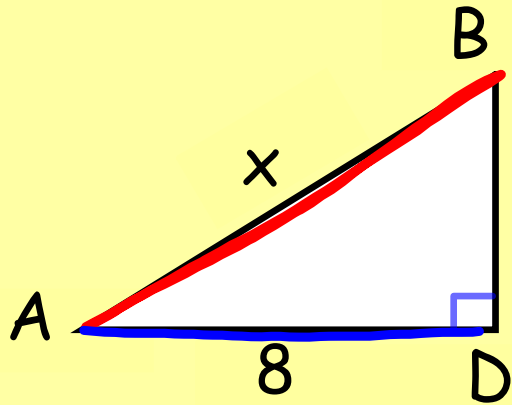
(FINDING THE ALTITUDE)

The length of the altitude to the hypotenuse of a right triangle is the geometric mean of the lengths of the segments of the hypotenuse.



$$\begin{aligned} & \frac{6}{x} = \frac{x}{10} \\ & \sqrt{x^2} = \sqrt{60} \\ & x = \sqrt{4 \cdot 15} \\ & x = 2\sqrt{15} \end{aligned}$$

Write a proportion and cross multiply to find the value of  $x$ .



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

COROLLARY 2 TO RIGHT TRIANGLE SIMILARITY THEOREM

(FINDING THE LEG)

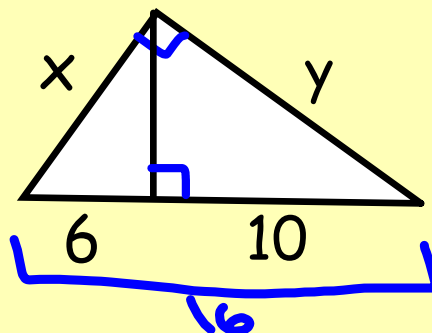
The altitude to the hypotenuse of a right triangle separates the hypotenuse so that the length of each leg of the triangle is the geometric mean of the length of the hypotenuse and the length of the segment of the hypotenuse adjacent to the leg.

$$\frac{16}{x} = \frac{x}{6}$$

$$\sqrt{x^2} = \sqrt{96}$$

$$x = \sqrt{16 \cdot 6}$$

$$x = 4\sqrt{6}$$



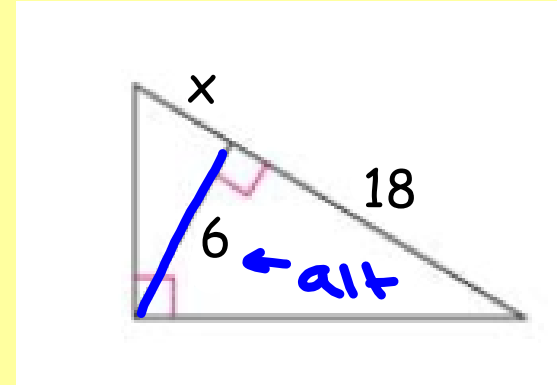
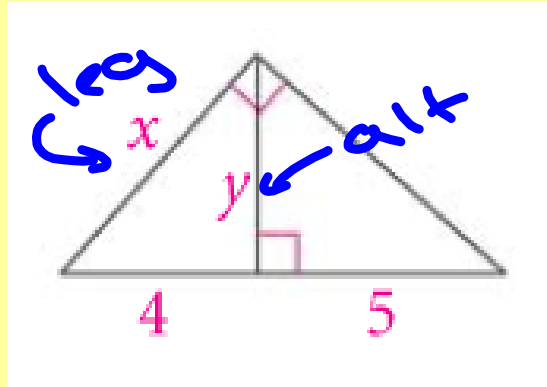
$$\frac{16}{y} = \frac{y}{10}$$

$$\sqrt{y^2} = \sqrt{160}$$

$$y = \sqrt{16 \cdot 10}$$

$$y = 4\sqrt{10}$$

## Finding Altitudes and Legs



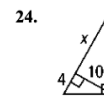
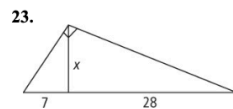
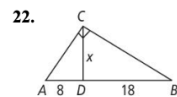
$$\frac{4}{x} = \frac{x}{9}$$

$$\frac{4}{x} = \frac{x}{9}$$

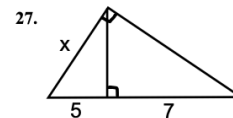
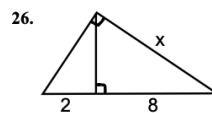
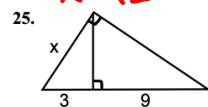
$$\frac{x}{6} = \frac{6}{18}$$

**Assignment:**  
 Concept 18 Worksheet  
 (back)

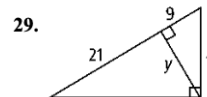
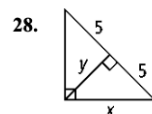
Find the value of x. Write your answer in simplified radical form.



~~$\frac{8}{x} = \frac{x}{18}$~~   
 ~~$x^2 = 144$~~   
 ~~$x = 12$~~

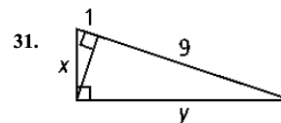
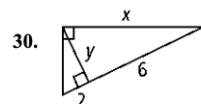


Find the value of x and y. Write your answers in simplified radical form.



x = \_\_\_\_  
 y = \_\_\_\_

x = \_\_\_\_  
 y = \_\_\_\_



x = \_\_\_\_  
 y = \_\_\_\_

x = \_\_\_\_  
 y = \_\_\_\_