

# Similarity and Solving

IC4

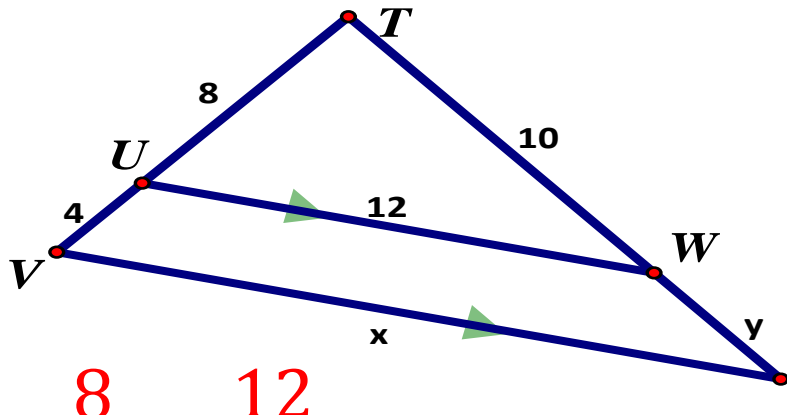
Polygons are similar if and only if:

1) All pairs of corresponding sides are Proportional/have same scale factor.

2) All pairs of corresponding angles are  $\cong$ .

1. Solve for the missing information, given that the two triangles in each question are SIMILAR.

a) Similarity Statement:  $\triangle UTW \sim \triangle VTX$



$$\frac{\text{small}}{\text{large}} = \frac{8}{12}$$

$$\frac{8}{12} = \frac{10}{10 + y}$$

$$8(10 + y) = 12(10)$$

$$80 + 8y = 120$$

$$8y = 40$$

$$y = 5$$

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

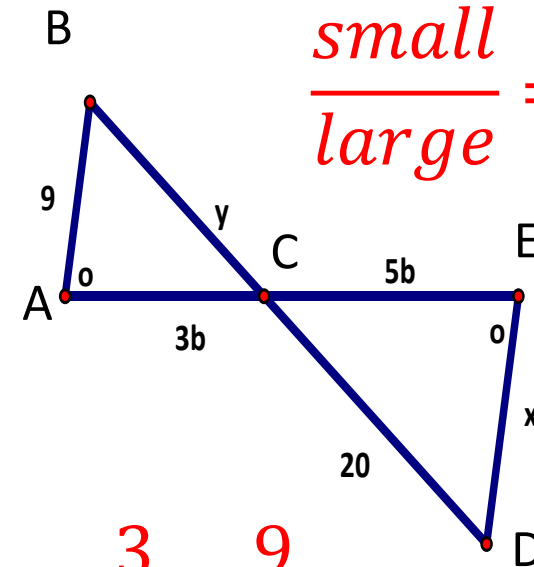
$$8x = 12(12)$$

$$8x = 144$$

$$x = 18$$

$$x = \underline{18} \quad y = \underline{5}$$

b) Similarity Statement:  $\triangle ABC \sim \triangle EDC$



$$\frac{\text{small}}{\text{large}} = \frac{3b}{5b} = \frac{3}{5}$$

$$\frac{3}{5} = \frac{9}{x}$$

$$3x = 45$$

$$x = 15$$

$$\frac{3}{5} = \frac{y}{20}$$

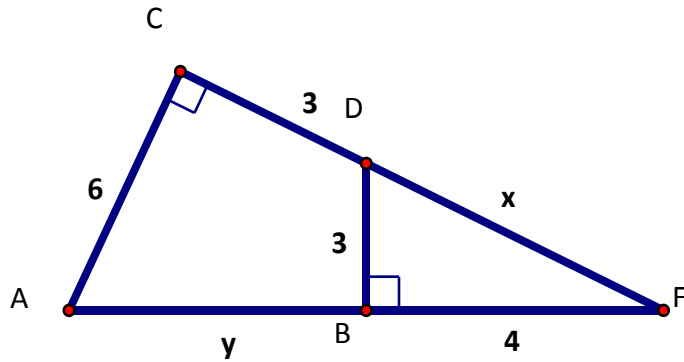
$$60 = 5y$$

$$y = 12$$

$$x = \underline{15} \quad y = \underline{12}$$

2. Use the Pythagorean Theorem to help you on these. Solving for the missing values.

a) Similarity Statement:  $\triangle ACF \sim \triangle DBF$



$$\frac{\text{small}}{\text{large}} = \frac{3}{6}$$

$$\frac{3}{6} = \frac{5}{4 + y}$$

$$3(4 + y) = 6(5)$$

$$12 + 3y = 30$$

$$3y = 18$$

$$y = 6$$

$$3^2 + 4^2 = x^2$$

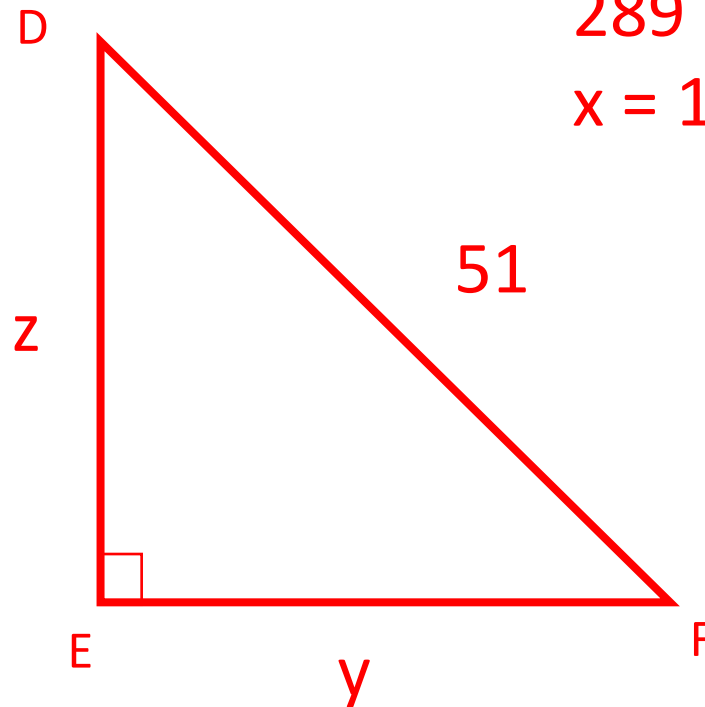
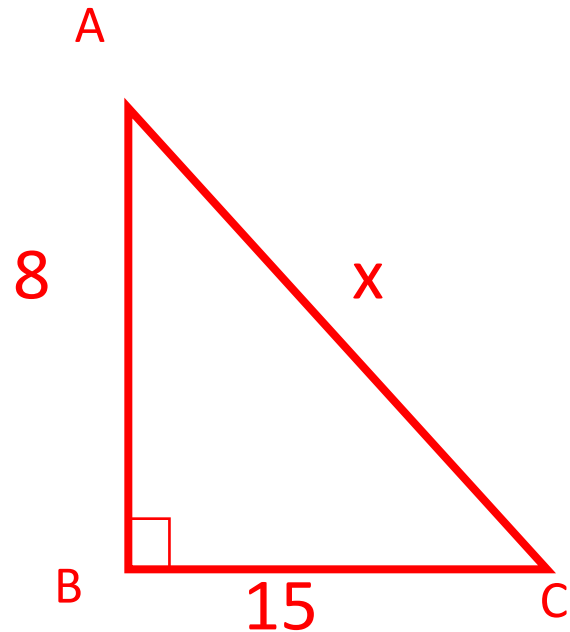
$$9 + 16 = x^2$$

$$25 = x^2$$

$$x = 5$$

2. Use the Pythagorean Theorem to help you on these. Solving for the missing values.

b) If  $\triangle ABC \sim \triangle DEF$ , and right  $\triangle ABC$  has sides of  $AB = 8$ ,  $BC = 15$ , &  $AC = x$  where  $AC$  is the hypotenuse. Also, right  $\triangle DEF$  has sides  $DE = z$ ,  $EF = y$ , &  $DF = 51$ . Draw a diagram and solve for  $x$ ,  $y$ , and  $z$ .



$$8^2 + 15^2 = x^2$$

$$64 + 225 = x^2$$

$$289 = x^2$$

$$x = 17$$

$$\frac{17}{51} = \frac{8}{z}$$

$$17z = 51(8)$$

$$17z = 408$$

$$z = 24$$

$$\frac{17}{51} = \frac{15}{y}$$

$$17y = 51(15)$$

$$17y = 765$$

$$y = 45$$