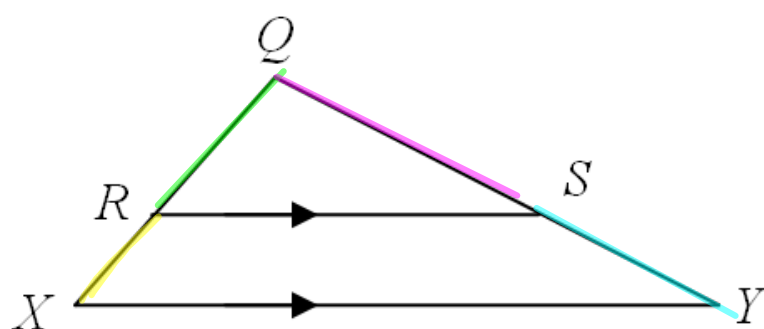


# **7.5**

## **Proportions in Triangles**

## Side-Splitter Theorem

If a line is parallel to one side of a triangle and intersects the other two sides, then it divides those sides proportionally.

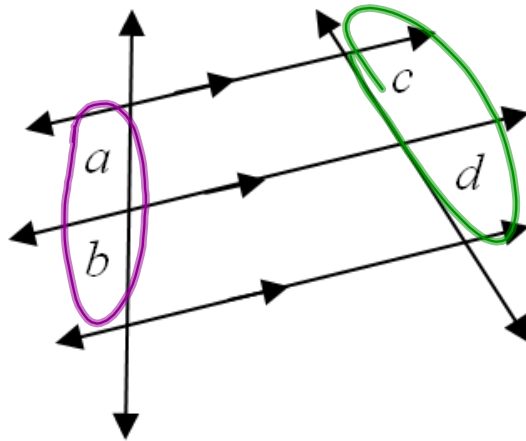


$$\frac{XR}{RQ} = \frac{YS}{SQ}$$

**Corollary**

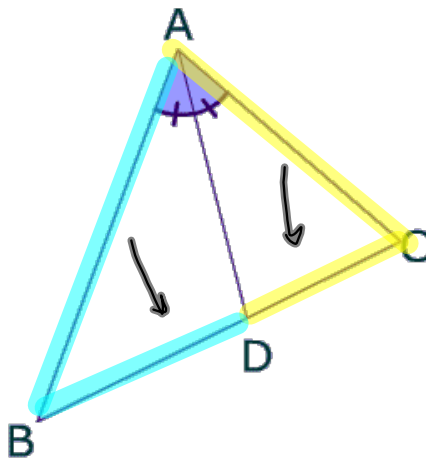
If three parallel lines intersect two transversals, then the segments intercepted on the transversals are proportional.

$$\frac{a}{b} = \frac{c}{d}$$



**Triangle-Angle-Bisector Theorem**

If a ray **BISECTS** an angle of a triangle, then it divides the opposite side into two segments that are **PROPORTIONAL** to the other two sides of the triangle.

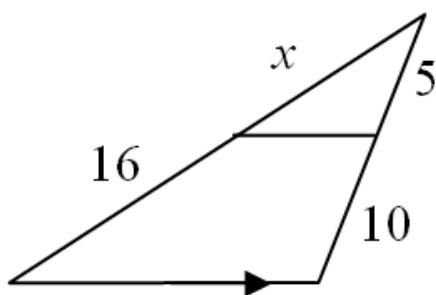


$$\frac{\overline{CA}}{\overline{CD}} = \frac{\overline{BA}}{\overline{DB}}$$

[www.mathwarehouse.com](http://www.mathwarehouse.com)

**Examples**

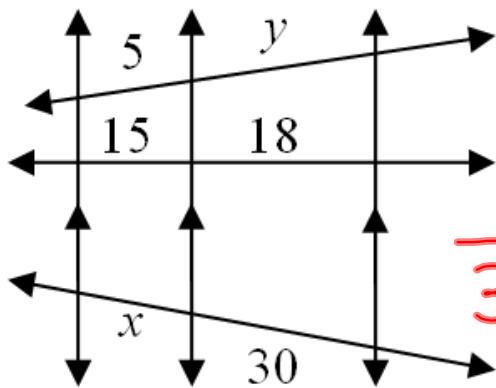
1) Find the value of x.



$$\frac{16}{x} = \frac{10}{5}$$
$$80 = 10x$$
$$x = 8$$

**Examples**

1. Solve for the indicated variables:



$$\frac{x}{30} = \frac{15}{18}$$

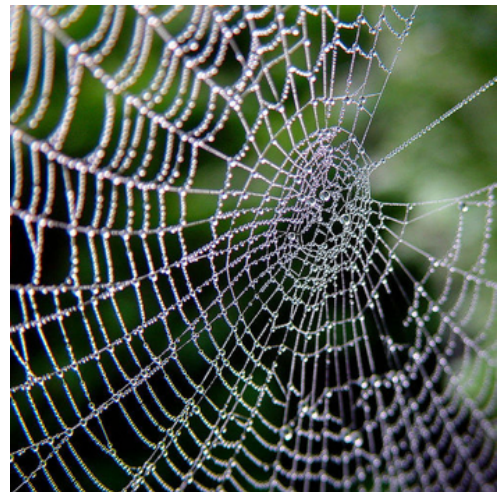
$$\frac{5}{15} = \frac{y}{18}$$

$$\frac{1}{3} = \frac{y}{18} \quad 3y = 18$$

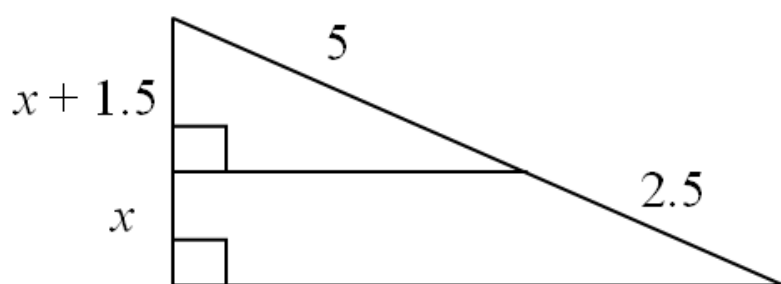
$$y = 6$$

$$\frac{x}{30} = \frac{5}{6} \quad (25)$$

$$150 = 6x$$



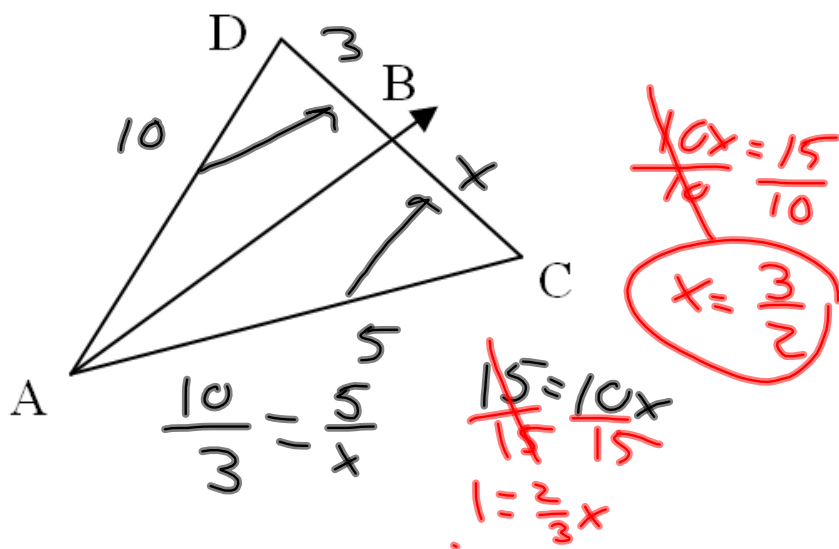
2. Find x.



$$\frac{x}{x+1.5} = \frac{2.5}{5}$$
$$2x = x + 1.5$$
$$x = 1.5$$

**Example**

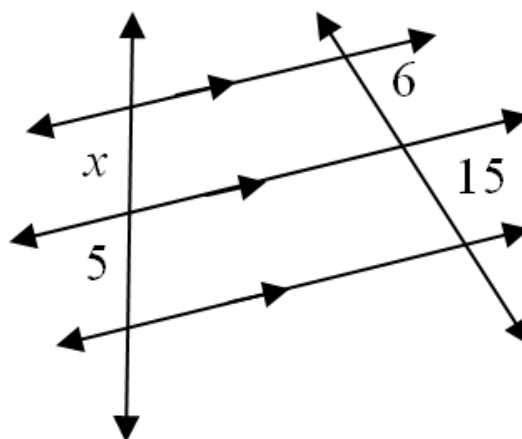
$\overrightarrow{AB}$  bisects  $\angle DAC$ ,  $AC = 5$ ,  $DB = 3$ ,  $AD = 10$ . Find  $BC$ .





## Practice

1. Solve for  $x$ .



3.  $\overrightarrow{AB}$  bisects  $\angle DAC$ ,  $AC = 10$ ,  $DB = 4$ ,  $AD = 15$ . Find  $BC$ .

