

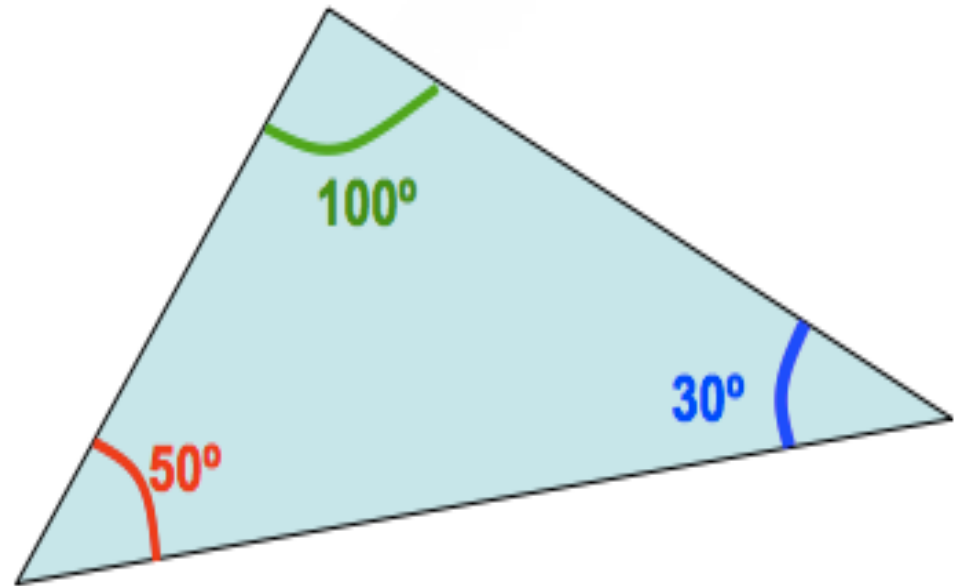
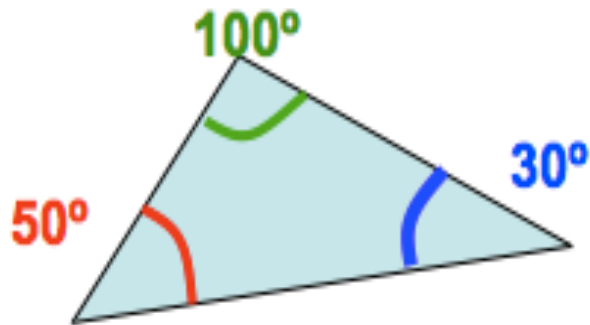
Similar shapes

- **Are Enlargements of each other**
- **Corresponding angles are congruent.**
- **Corresponding sides are related by the same scale factor (they are proportional)**

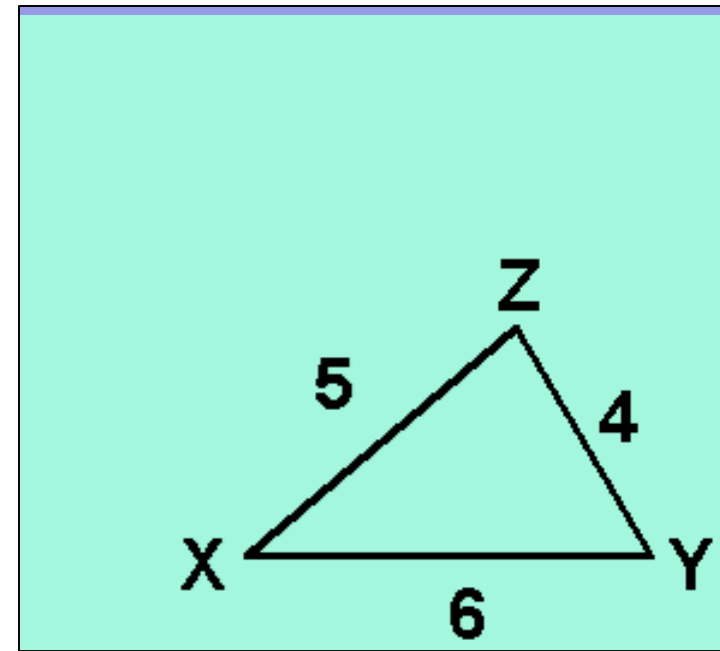
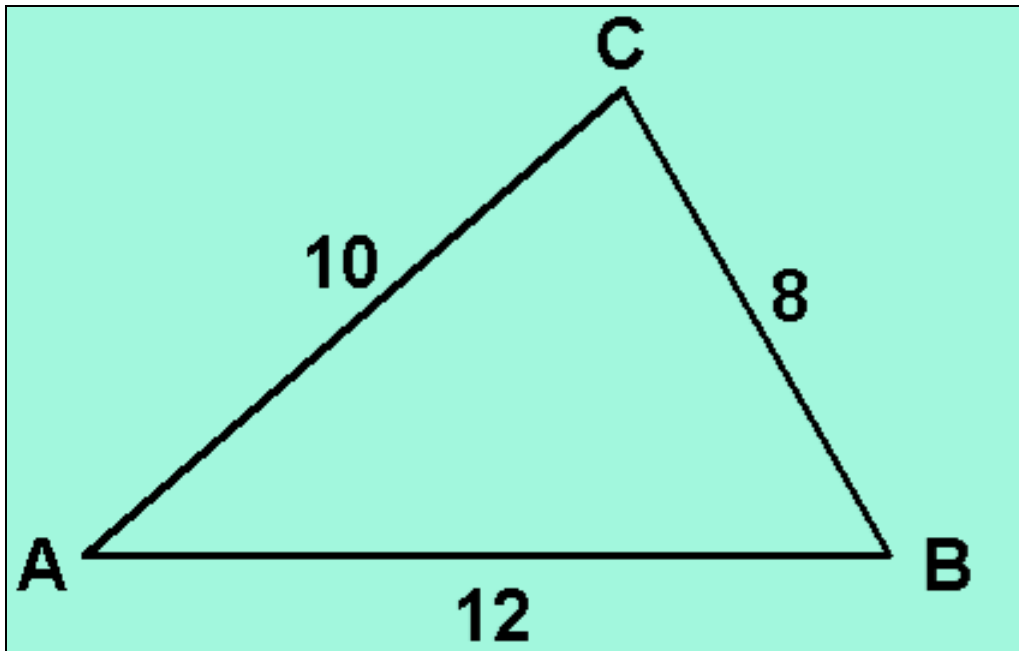


Similar Triangles

Triangles are similar if matching angles remain the same size.



Similar triangles are triangles that have the same shape but not necessarily the same size.



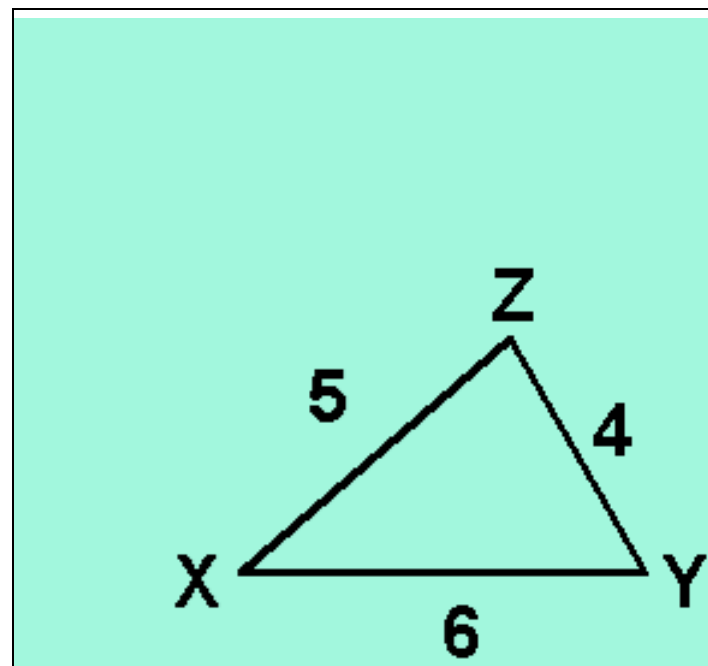
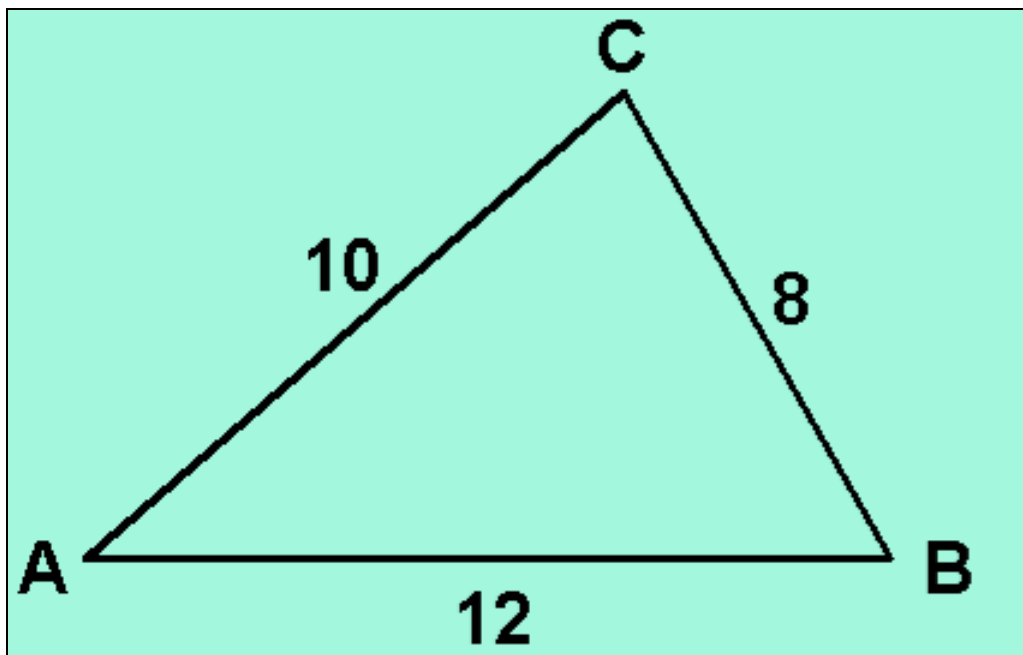
$$\triangle ABC \sim \triangle XYZ$$

$$\angle A \cong \angle X$$

$$\angle B \cong \angle Y$$

$$\angle C \cong \angle Z$$

Compare the ratios of the corresponding sides.



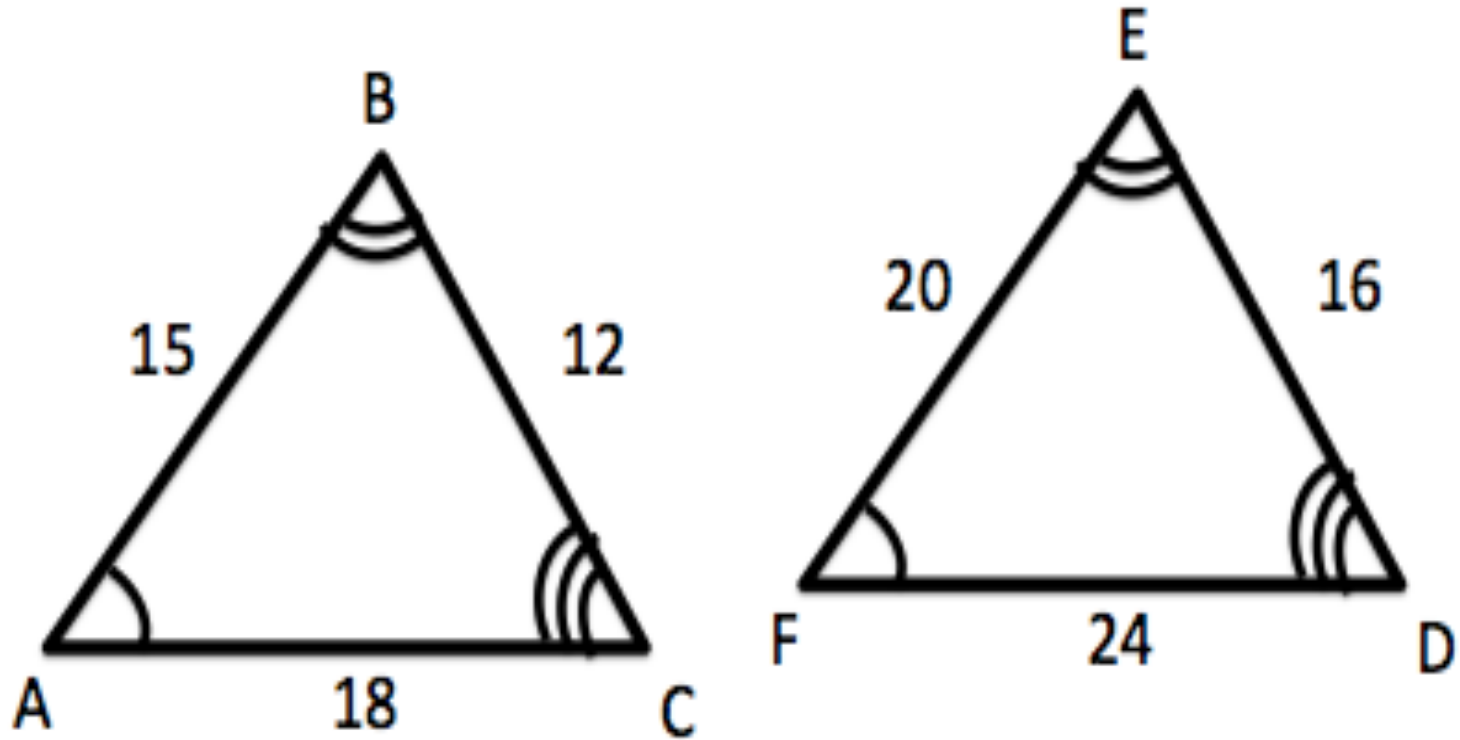
$$\frac{AC}{XC} = \frac{10}{5} = \frac{2}{1}$$

$$\frac{AB}{XY} = \frac{12}{6} = \frac{2}{1}$$

$$\frac{CB}{ZY} = \frac{8}{4} = \frac{2}{1}$$

$\triangle ABC \sim \triangle XYZ$ with a similarity ratio 2:1.

Are the triangles similar? If the triangles are similar, state the similarity statement and similarity ratio.



A proportion is a statement that two ratios are equal.

In symbol, $\frac{a}{b} = \frac{c}{d}$ ($b \neq 0$, $d \neq 0$), or $a:b = c:d$.

It is read "*a is to b as c is to d*".

Find x .

$$\frac{6}{x} = \frac{15}{10}$$

$$\frac{x}{90 - x} = \frac{2}{7}$$

$$7 : x = 3 : 10$$

Properties of Proportions

$\frac{a}{b} = \frac{c}{d}$ is equivalent to

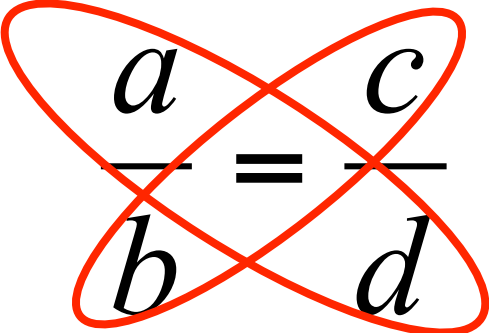
(1) $ad = bc$

(2) $\frac{b}{a} = \frac{d}{c}$

(3) $\frac{a}{c} = \frac{b}{d}$

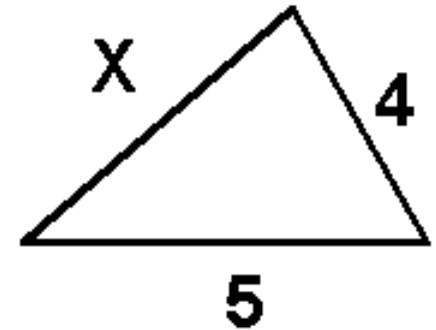
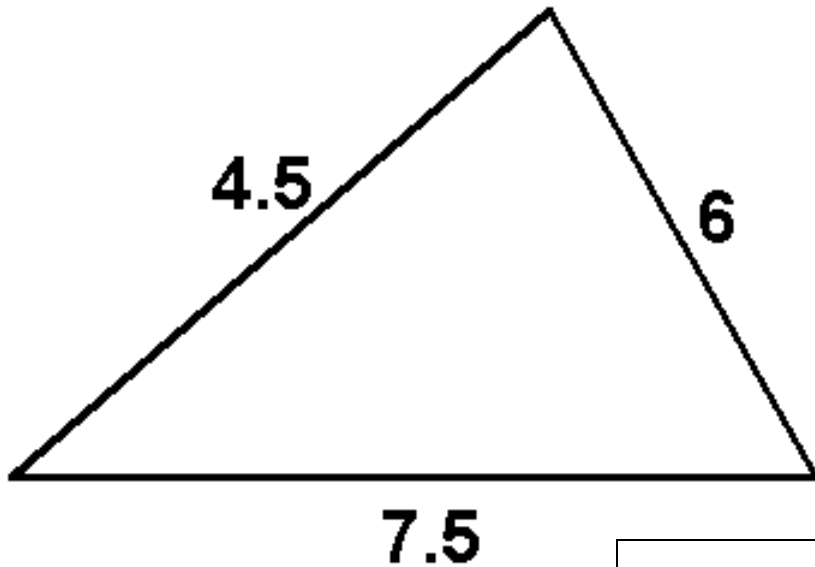
(4) $\frac{a+b}{b} = \frac{c+d}{d}$

If the product of the extremes equals the product of the means then a proportion exists.


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

$$ad = bc$$

The two triangles below are known to be similar, determine the missing value x .



$$\frac{7.5}{5} = \frac{4.5}{x}$$

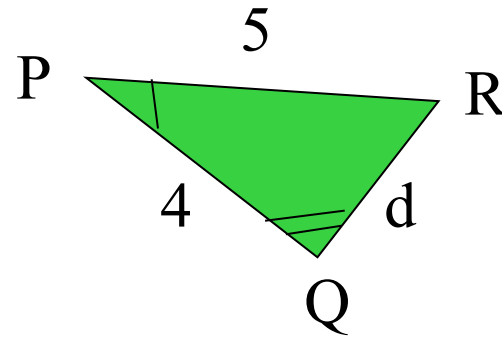
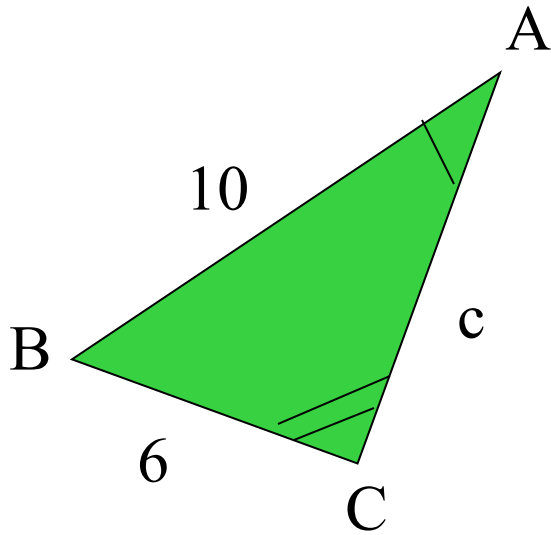
$$\frac{7.5}{5} = \frac{4.5}{x}$$

$$7.5x = 5(4.5)$$

$$7.5x = 22.5$$

$$x = 3$$

In the figure, the two triangles are similar.
What are c and d ?

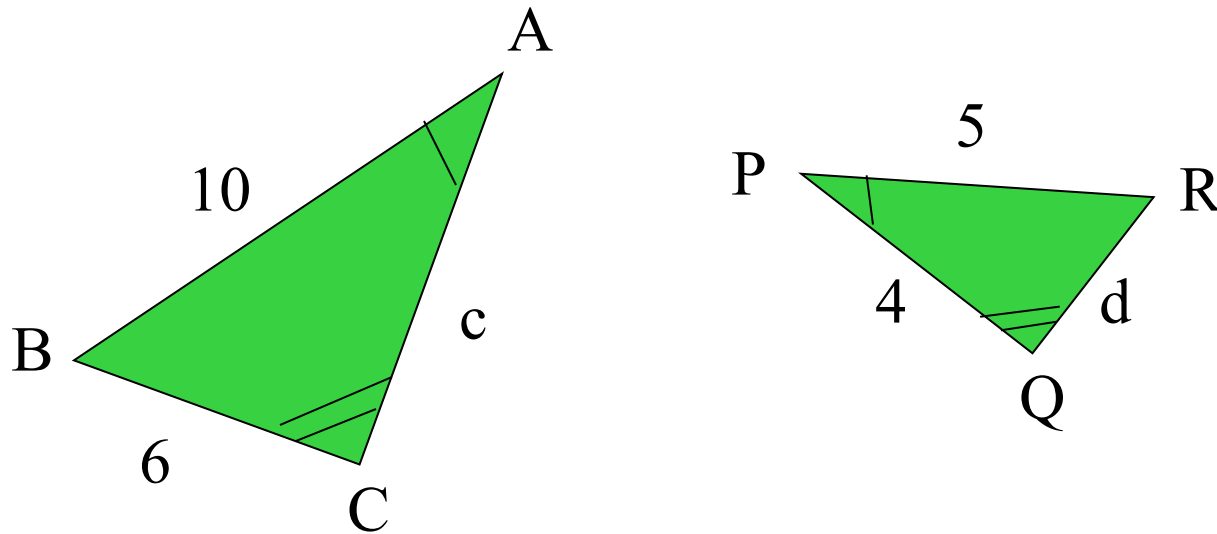


$$\frac{10}{5} = \frac{c}{4}$$

$$40 = 5c$$

$$8 = c$$

In the figure, the two triangles are similar.
What are c and d ?



$$\frac{10}{5} = \frac{6}{d} \quad 10d = 30 \quad d = 3$$

Homework

Answer Worksheet 1

Bring: ruler, protractor, pencil