

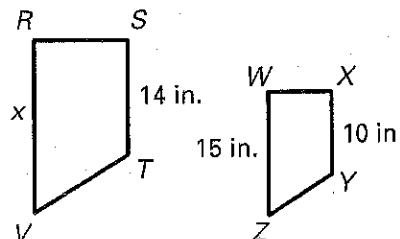
Goal: Find unknown side lengths of similar figures.

Example 1 Finding an Unknown Side Length in Similar Figures

Given $RSTV \sim WXYZ$, find VR .

Solution

Use the ratios of the lengths of corresponding sides to write a proportion involving the unknown length, VR .



$$\frac{XY}{ST} = \frac{WZ}{RV}$$

Write proportion involving VR .

$$\frac{10}{15} = \frac{14}{x}$$

Substitute.

$$10 \cdot x = 15 \cdot 14$$

Cross products property

$$\frac{10x}{10} = \frac{210}{10}$$

$$x = 21$$

Multiply.

Divide each side by 10.

Answer: The length of VR is 21 inches.

Checkpoint

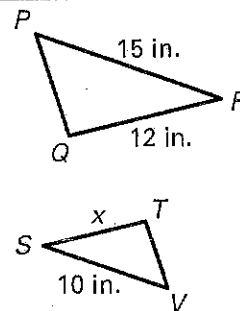
1. Given $\triangle PQR \sim \triangle VTS$, find TS .

$$\frac{SV}{PR} = \frac{ST}{QR}$$

$$\frac{10}{15} = \frac{x}{12}$$

$$15x = 120$$

$$x = 8$$



Example 2**Using Indirect Measurement**

Height At a certain time of day, a person who is 6 feet tall casts a 3-foot shadow. At the same time, a tree casts an 11-foot shadow. The triangles formed are similar. Find the height of the tree.

**Solution**

Write and solve a proportion to find the height h of the tree.

$$\frac{\text{Height of tree}}{\text{Height of person}} = \frac{\text{Shadow TREE}}{\text{Shadow Person}}$$

$$\frac{h}{6} = \frac{11}{3}$$

Substitute values.

$$3 \cdot h = 6 \cdot 11$$

Cross products property

$$3h = 66$$

Multiply.

$$h = 22$$

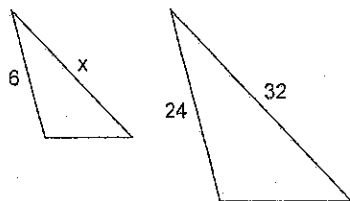
Divide each side by 3.

Answer: The tree has a height of 22 feet.

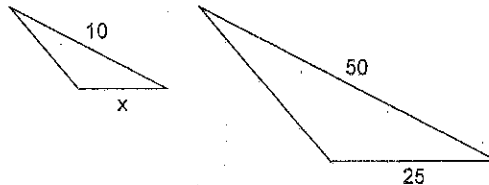
GUIDED PRACTICE

Each pair of figures is similar. Find the missing side.

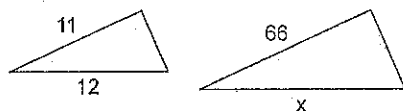
1)



2)



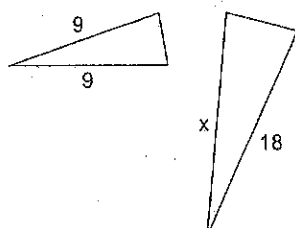
3)



4)



5)



6)

