

5-8 Using Similar Figures

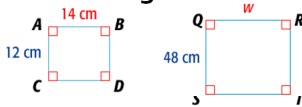
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Indirect measurement is a method of using proportions to find an unknown length or distance in similar figures.

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Find the unknown length in similar figures.



$$\frac{AC}{QS} = \frac{AB}{QR}$$

$$\frac{12}{48} = \frac{14}{w}$$

Write a proportion using corresponding sides.

Substitute lengths of the sides.

$$12 \cdot w = 48 \cdot 14$$

Find the cross product.

$$12w = 672$$

Multiply.

$$\frac{12w}{12} = \frac{672}{12}$$

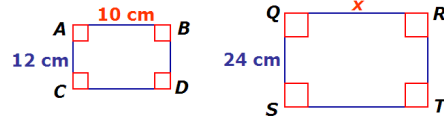
Divide each side by 12 to isolate the variable.

$$w = 56$$

QR is 56 centimeters.

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Find the unknown length in similar figures.



$$\frac{AC}{QS} \sim \frac{AB}{QR}$$

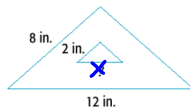
$$\frac{12}{24} = \frac{10}{x}$$

$$\frac{12x}{12} = \frac{240}{12}$$

$$x = 20$$

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The inside triangle is similar in shape to the outside triangle. Find the length of the base of the inside triangle.



Let x = the base of the inside triangle.

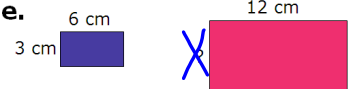
$$\frac{8}{2} = \frac{12}{x}$$

$$\frac{8x}{8} = \frac{24}{8}$$

$$x = 3$$

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The rectangle on the left is similar in shape to the rectangle on the right. Find the width of the right rectangle.



$$\frac{3}{x} = \frac{6}{12}$$

$$\frac{36}{6} = \frac{6x}{6}$$

$$x = 6$$

Mar 18-10:45 AM

City officials want to know the height of a traffic light. Estimate the height of the traffic light.

$$\frac{27.25}{48.75} = \frac{15}{h}$$

$$\frac{731.25}{27.25} = \frac{27.25h}{27.25}$$

$$h = 26.834 \text{ ft.}$$

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The inside triangle is similar in shape to the outside triangle. Find the height of the outside triangle.

$$\frac{14.75}{30.25} = \frac{5}{h}$$

$$\frac{14.75h}{14.75} = \frac{151.25}{14.75}$$

$$h = 10.25$$

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Find the unknown length in each pair of similar figures.

1.

$$\frac{AB}{JK} = \frac{BC}{KL} = \frac{AC}{JL}$$

$$\frac{96}{x} = \frac{80}{144}$$

$$\frac{13824}{80} = \frac{80x}{80}$$

$$x = 172.8$$

2.

$$\frac{t}{120} = \frac{90}{72}$$

$$\frac{10800}{72} = \frac{72t}{72}$$

$$t = 150$$

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Find the unknown length in each pair of similar figures.

3. The width of the smaller rectangular cake is 5.75 in. The width of a larger rectangular cake is 9.25 in. Estimate the length of the larger rectangular cake.

$$\frac{5.75}{9.25} = \frac{10}{x}$$

$$\frac{5.75x}{5.75} = \frac{92.5}{5.75}$$

$$x = 16.086$$

Mar 18-10:49 AM

Kareem and Julio have rectangular model train layouts that are similar to each other. Julio's layout is 4 feet by 7 feet. Kareem's layout is 6 feet wide. What is the length of Kareem's layout?

$$\frac{6}{4} = \frac{x}{7}$$

$$x = 10.5$$

$$\frac{42}{4} = \frac{4x}{4}$$

Mar 19-8:16 AM

A 6-foot-tall adult casts a shadow that is 15 feet long. Estimate the height of a child who casts a 10-foot shadow.

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

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

$$\frac{60}{15} = \frac{15x}{15}$$

$$x = 4$$

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