5-8 Using Similar Figures

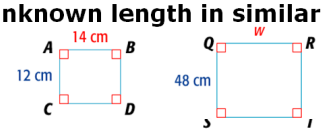
p. 304 3-13-18

Mar 18-10:44 AM

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

Mar 18-10:43 AM

Find the unknown length in similar figures.



$\frac{AC}{QS} = \frac{AB}{QR}$ *Write a proportion using corresponding sides.*

$\frac{12}{48} = \frac{14}{w}$ *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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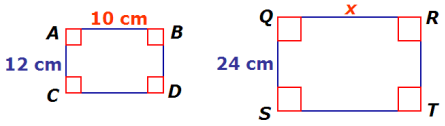
Find the unknown length in similar figures.



$\frac{12}{24} = \frac{10}{x}$ 20 cm

$12x = 240$

$x = 20$

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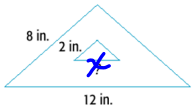
The inside triangle is similar in shape to the outside triangle. Find the length of the base of the inside triangle.



Let x = the base of the inside triangle.

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

$8x = 24$

$x = 3$ in

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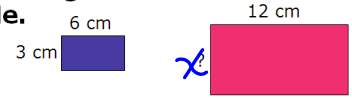
The rectangle on the left is similar in shape to the rectangle on the right. Find the width of the right rectangle.



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

$6x = 36$

$x = 6$ cm

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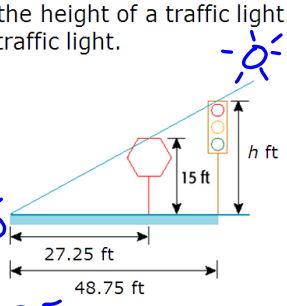
City officials want to know the height of a traffic light. Estimate the height of the traffic light.



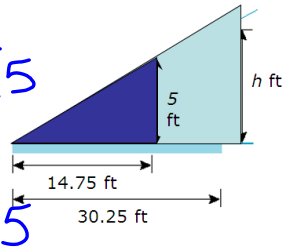
$\frac{15}{27.25} = \frac{h}{48.75}$

$27.25h = 731.25$

$h = 26.83$ ft

Mar 18-10:46 AM

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



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

$14.75h = 151.25$

$h = 10.25$ ft

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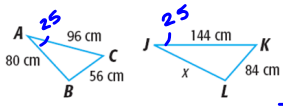
Find the unknown length in each pair of similar figures.

1.

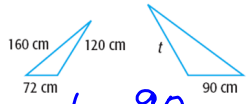


$\frac{x}{80} = \frac{144}{96}$

$96x = 11{,}520$

$x = 120$ cm

2.



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

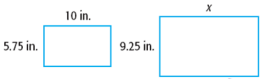
$72t = 10{,}800$

$t = 150$ cm

Mar 18-10:47 AM

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.



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

$5.75x = 92.5$

$x = 16.09$ in.

Mar 18-10:49 AM