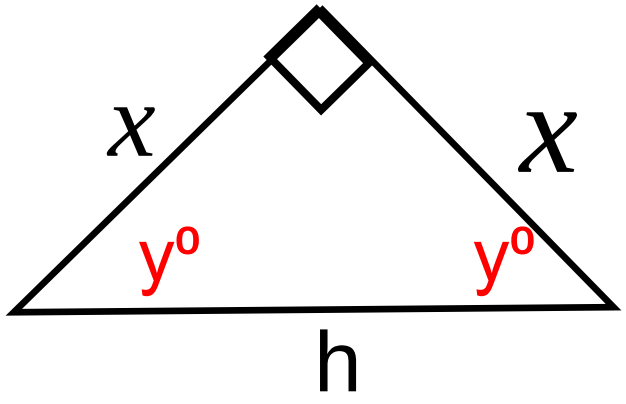
Math- 2A

Lesson 9-5

Using Proportions To Solve
45-45-90 Right Triangles.

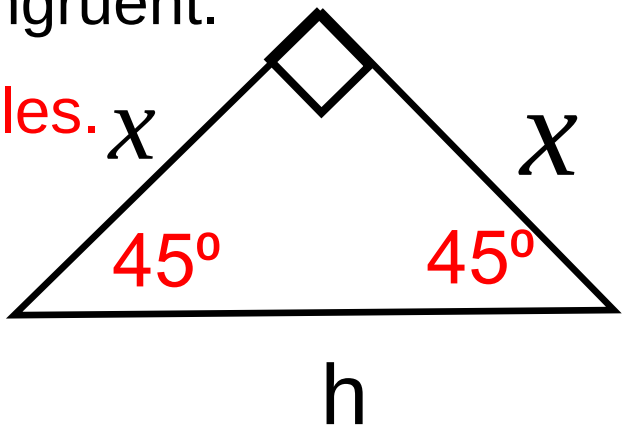
Isosceles Right Triangle: a right triangle with two sides that are congruent.



1) Find the measures of the base angles.

$$y^\circ + y^\circ + 90 = 180$$

$$2y^\circ = 90 \quad y = 45^\circ$$



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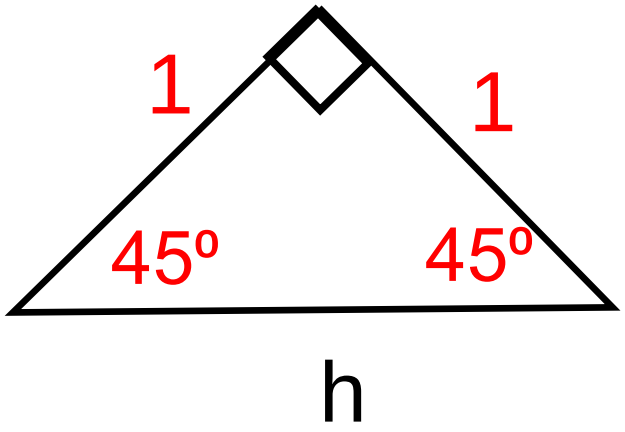
2) "X" can be any number. To make it ***really*** easy, lets just make x = 1.

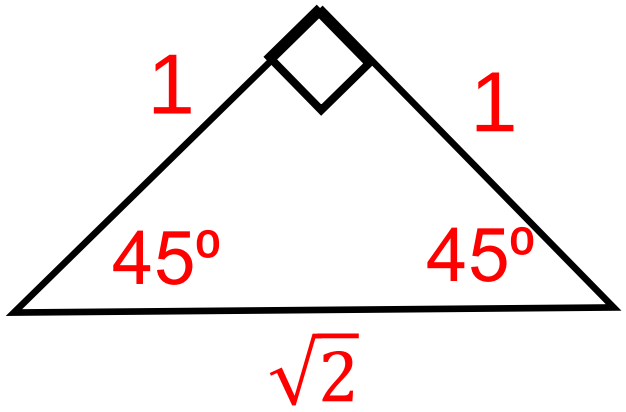
3) *Solve for 'h'.* $a^2 + b^2 = c^2$



$$1^2 + 1^2 = c^2$$

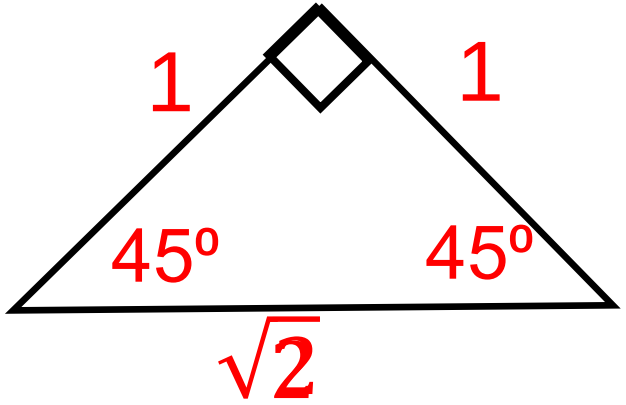
$$2 = c^2$$

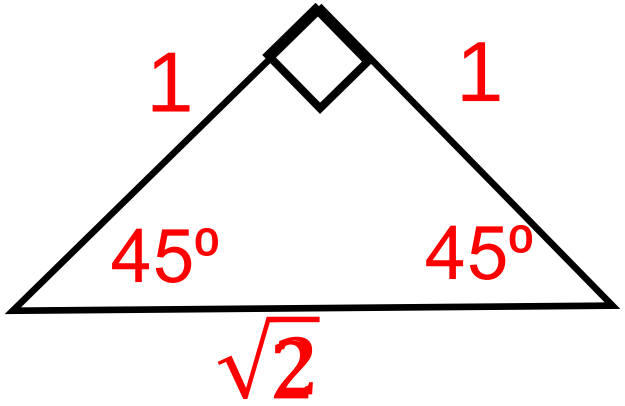
$$c = \sqrt{2}$$

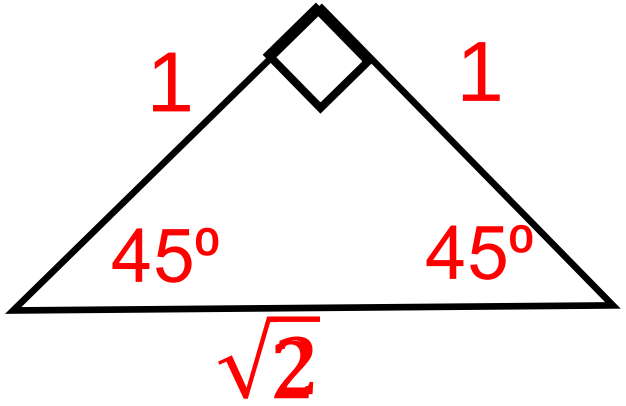


Isosceles Right Triangle: a right triangle with two sides that are congruent.

"One-One-Two-Root"

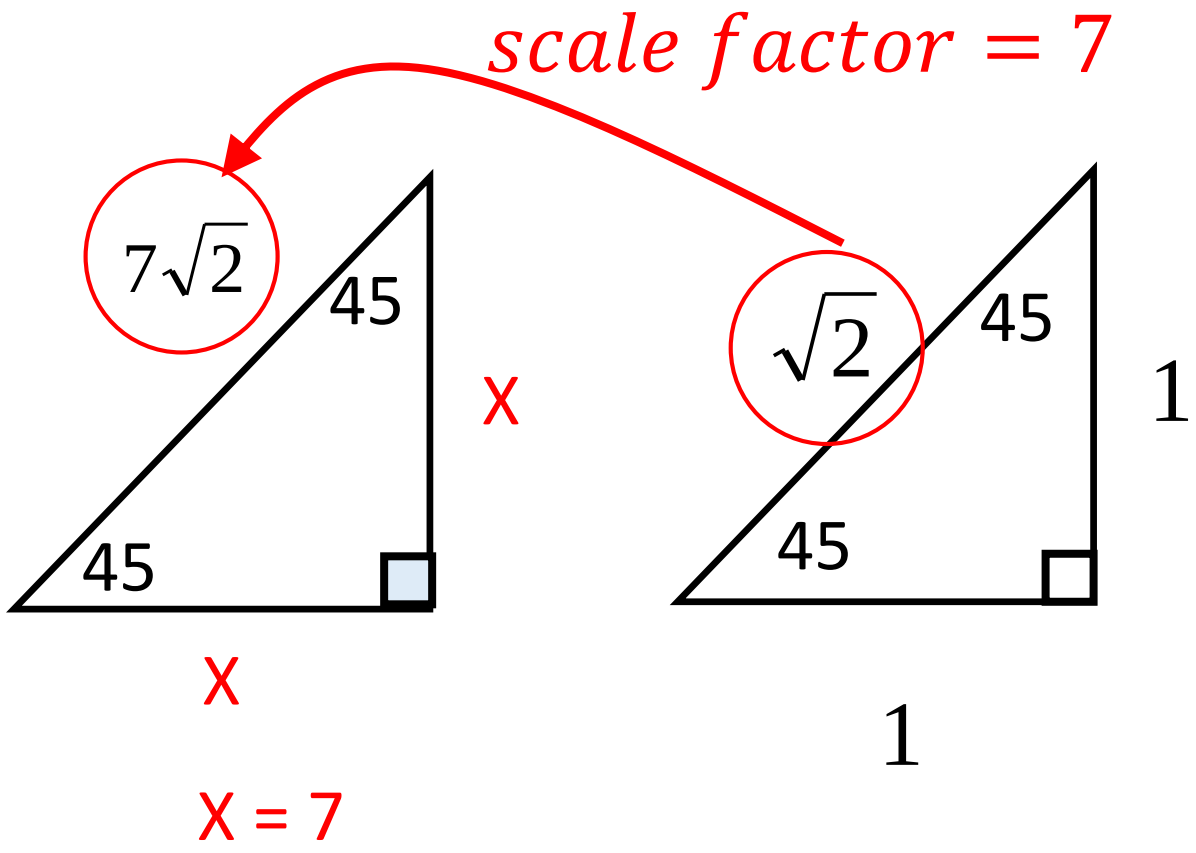






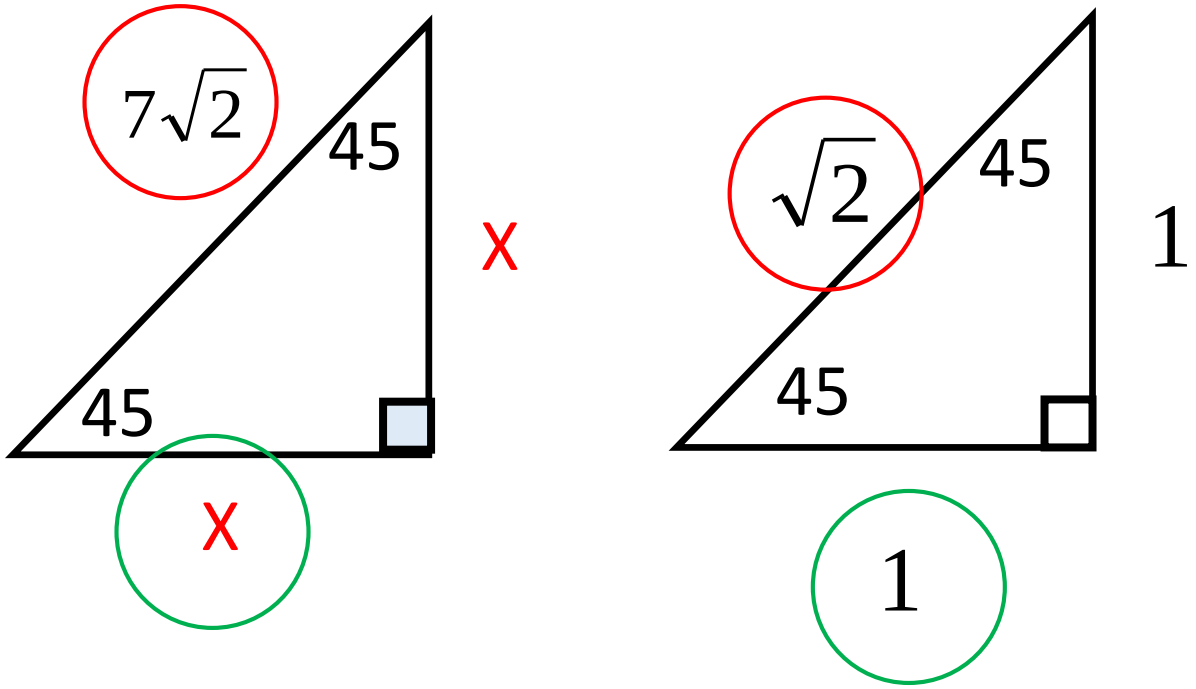
45-45-90 Right Triangle

Can you use scale factors to solve for the lengths of sides of similar 45-45-90 right triangles?



45-45-90 Right Triangle

Can you use a proportion to solve for the lengths of sides of similar 45-45-90 right triangles?



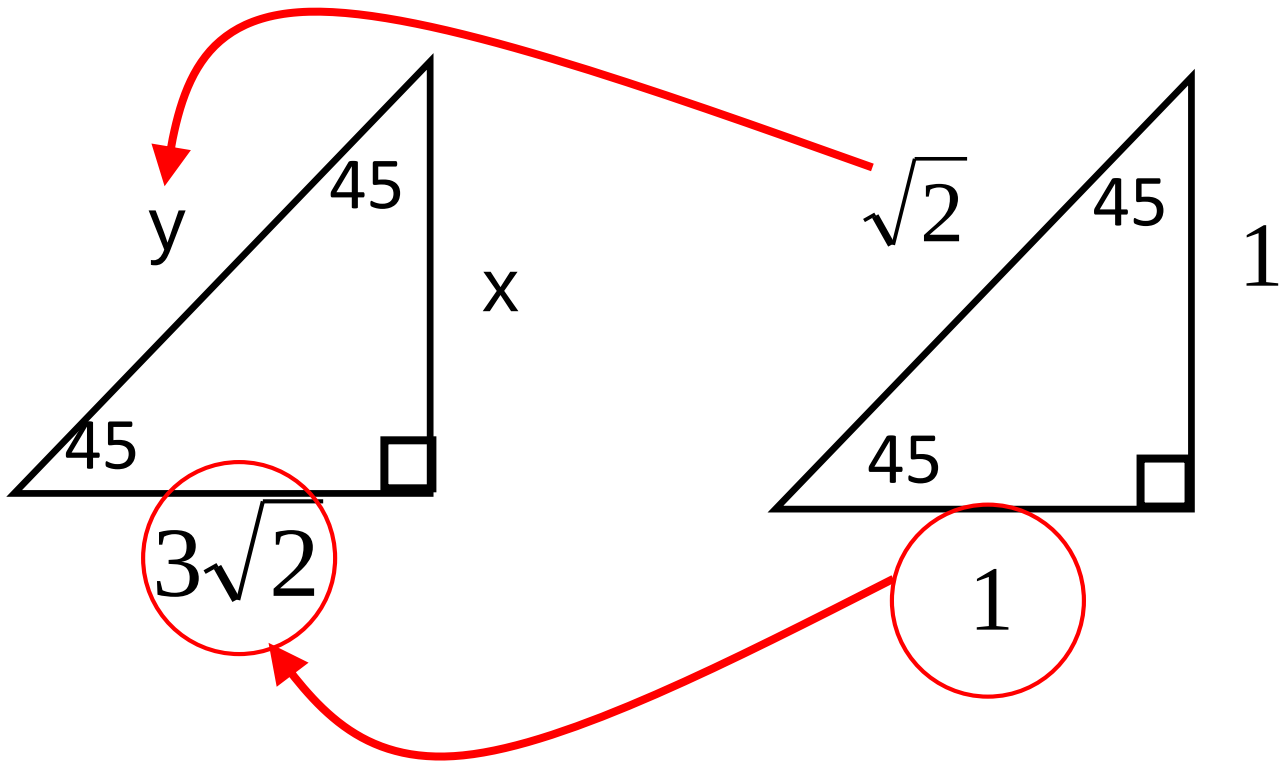
Write a proportion (equation where a fraction equals a fraction)

$$\frac{7\sqrt{2}}{\sqrt{2}} = \frac{x}{1}$$

$$\frac{7\cancel{\sqrt{2}}}{\cancel{\sqrt{2}}} = \frac{x}{1}$$

X = 7

Use the scale factor to solve for the lengths of sides of similar 45-45-90 triangle.



$scale\ factor = 3\sqrt{2}$

Isosceles Right Triangle!

$x = 3\sqrt{2}$

$y = (scale\ factor) * \sqrt{2}$

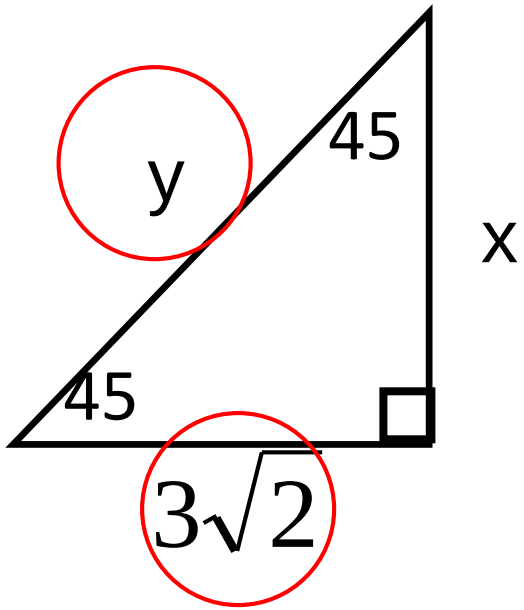
$y = 3\sqrt{2} * \sqrt{2}$

$y = 3\sqrt{2 * 2}$

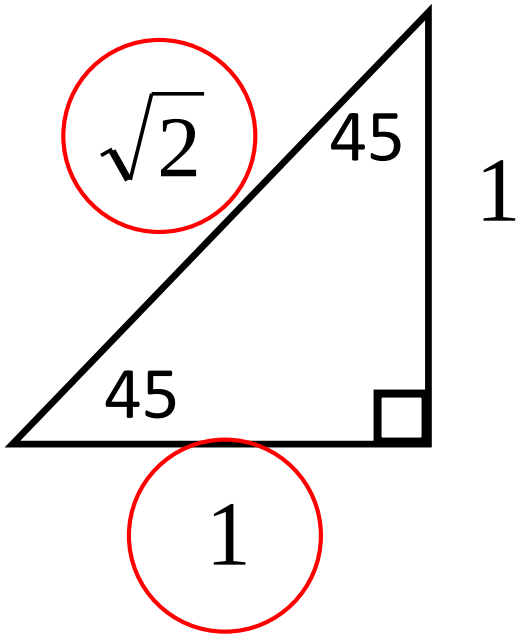
$y = 3 * 2$

$y = 6$

Use scale factors or proportions to solve for the lengths of sides of similar 45-45-90 right triangles.



x



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Isosceles Right Triangle!

$$x = 3\sqrt{2}$$

Write a proportion (equation where a fraction equals a fraction)

$$\frac{3\sqrt{2}}{1} = \frac{y}{\sqrt{2}}$$

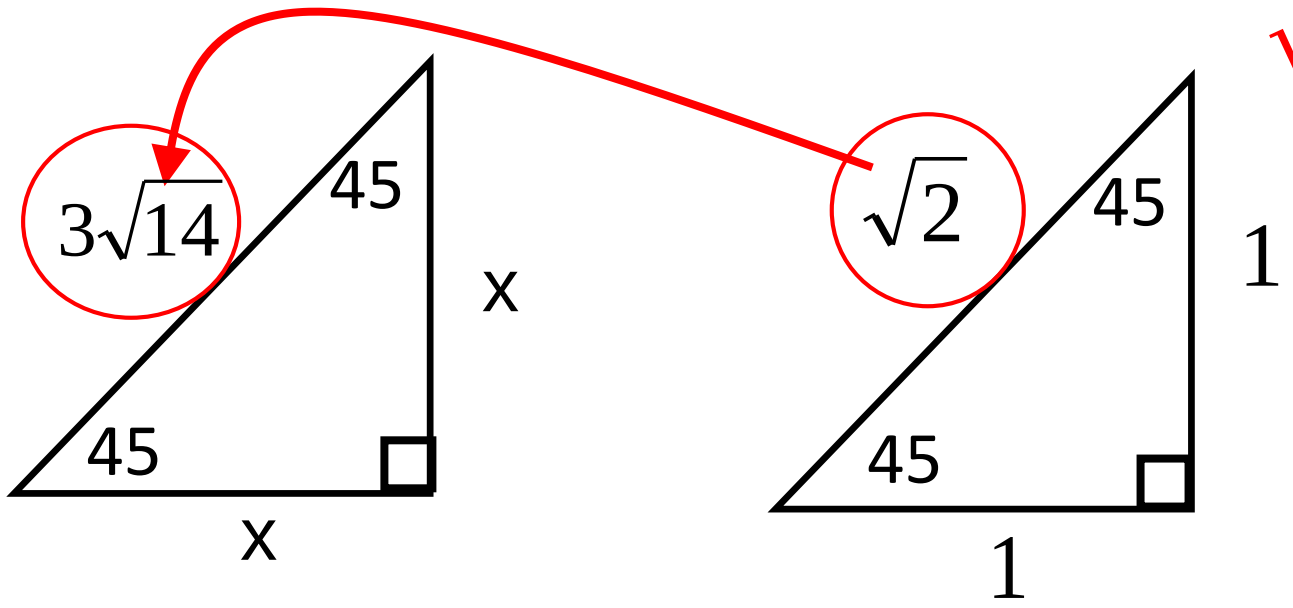
$$\frac{3\sqrt{2}}{1} * \frac{\sqrt{2}}{1} = \frac{y}{\cancel{\sqrt{2}}} * \frac{\cancel{\sqrt{2}}}{1}$$

$$3\sqrt{2 * 2} = y$$

$$3 * 2 = y$$

$$6 = y$$

Use the scale factor to solve for the lengths of sides of similar 45-45-90 triangle.



$$\sqrt{2} * (scale\ factor) = 3\sqrt{14}$$

$\div \sqrt{2}$ $\div \sqrt{2}$

$$(scale\ factor) = \frac{3\sqrt{14}}{\sqrt{2}}$$

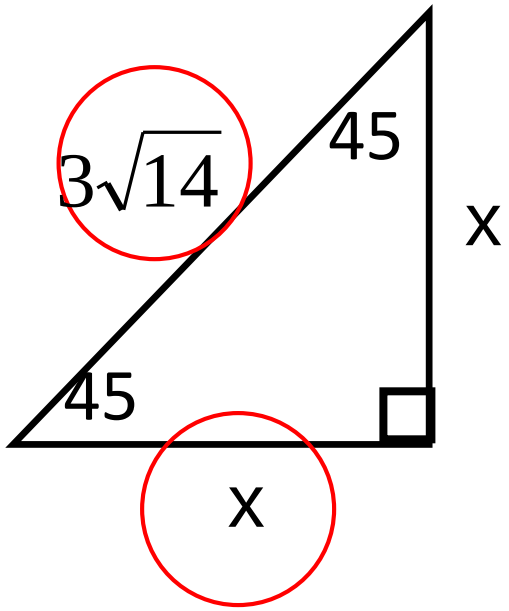
$$(scale\ factor) = \frac{3\sqrt{2}\sqrt{7}}{\sqrt{2}}$$

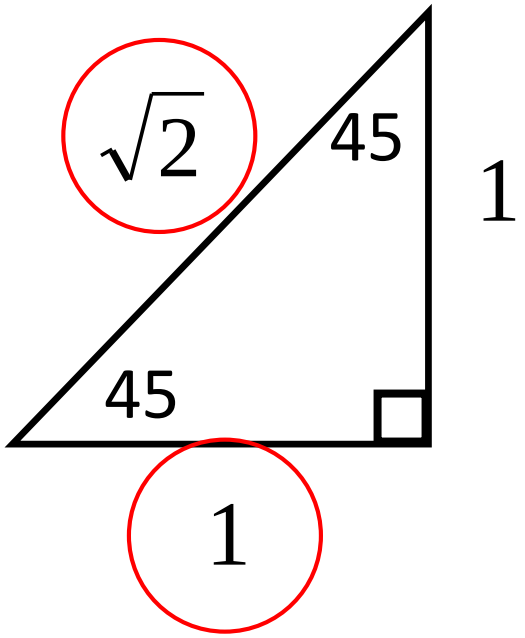
$$(scale\ factor) = 3\sqrt{7}$$

$$x = (scale\ factor) * 1$$

$$x = 3\sqrt{7}$$

Use scale factors or proportions to solve for the lengths of sides of similar 45-45-90 right triangles.





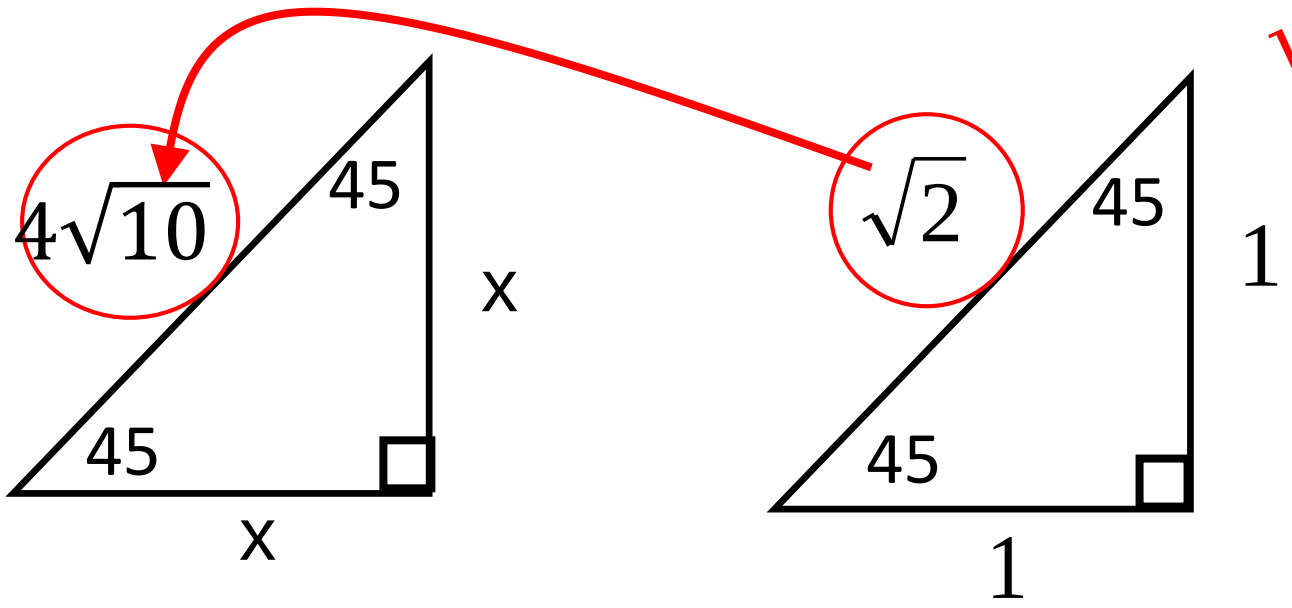
Write a proportion (equation where a fraction equals a fraction)

$$\frac{3\sqrt{14}}{\sqrt{2}} = \frac{x}{1}$$

$$\frac{3\sqrt{2}\sqrt{7}}{\sqrt{2}} = x$$

$$x = 3\sqrt{7}$$

Use the scale factor to solve for the lengths of sides of similar 45-45-90 triangle.



$$\sqrt{2} * (scale\ factor) = 4\sqrt{10}$$

$\div \sqrt{2}$ $\div \sqrt{2}$

$$(scale\ factor) = \frac{4\sqrt{10}}{\sqrt{2}}$$

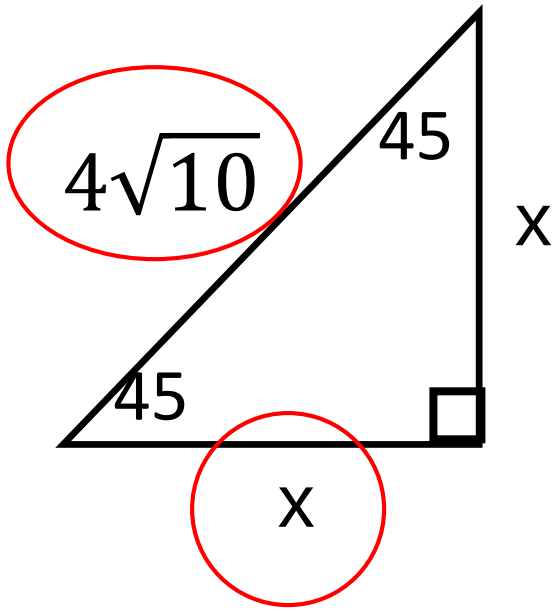
$$(scale\ factor) = \frac{4\sqrt{2}\sqrt{5}}{\sqrt{2}}$$

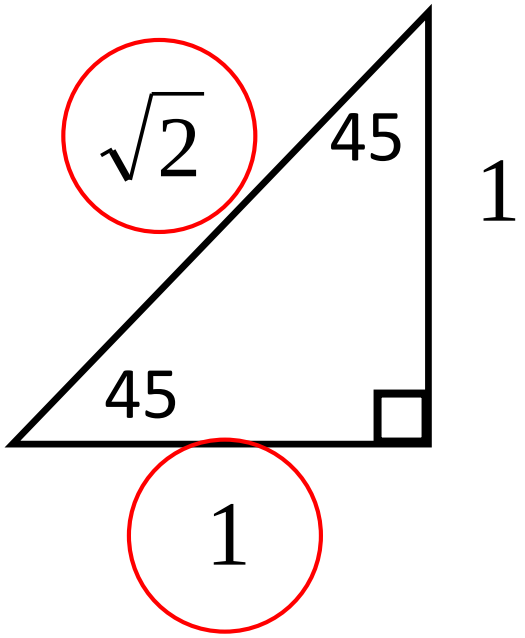
$$x = (scale\ factor) * 1$$

$$(scale\ factor) = 4\sqrt{5}$$

$$x = 4\sqrt{5}$$

Use scale factors or proportions to solve for the lengths of sides of similar 45-45-90 right triangles.





Write a proportion (equation where a fraction equals a fraction)

$$\frac{4\sqrt{10}}{\sqrt{2}} = \frac{x}{1}$$

$$\frac{4\sqrt{2}\sqrt{5}}{\sqrt{2}} = x$$

$$x = 4\sqrt{5}$$