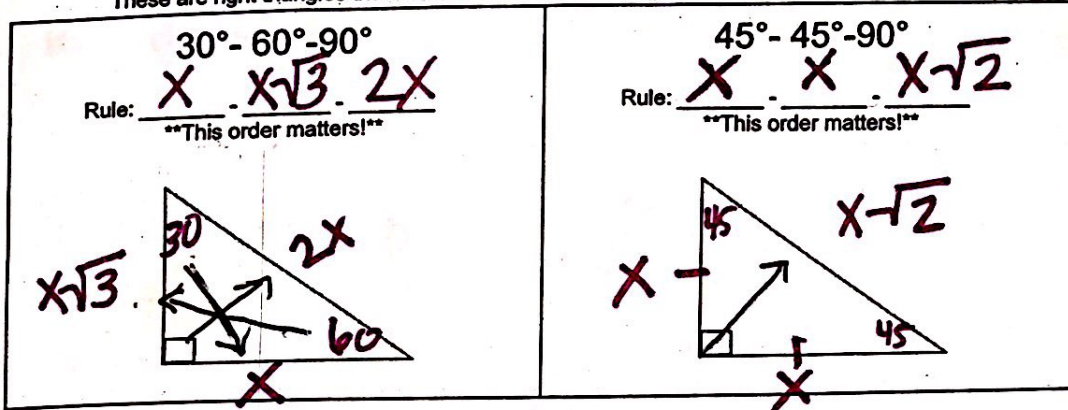


# Special Right Triangles

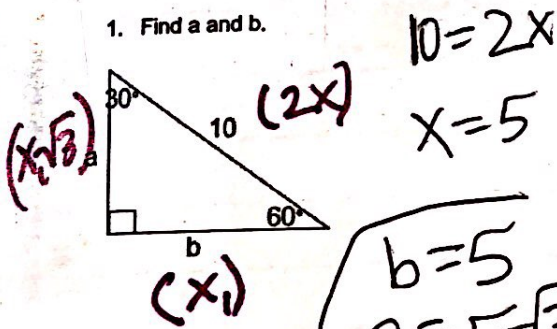
## Special Right Triangles

These are right triangles that have consistent relationships between the angles and sides.

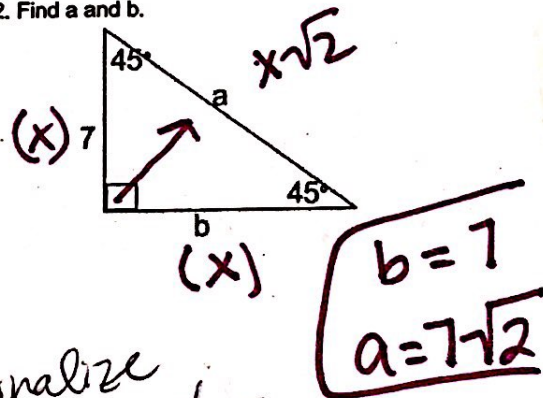


Examples:

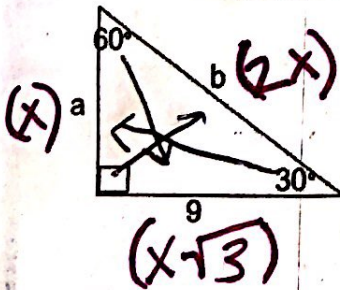
1. Find a and b.



2. Find a and b.



3. Find a and b. \*\*In this problem, we have to rationalize the denominator, because there is a radical in the denominator.



$$9 = X\sqrt{3}$$

$$\frac{9}{\sqrt{3}} = \frac{X\sqrt{3}}{\sqrt{3}}$$

$$X = \frac{9}{\sqrt{3}} \rightarrow$$

$$X = \frac{9}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{9\sqrt{3}}{3} = 3\sqrt{3}$$

$$a = 3\sqrt{3}$$

$$b = 6\sqrt{3}$$



# Shortcuts & Practice

30-60-90

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

45-45-90

$$x - x - x\sqrt{2}$$

Special  
Right  
Triangles  
Practice

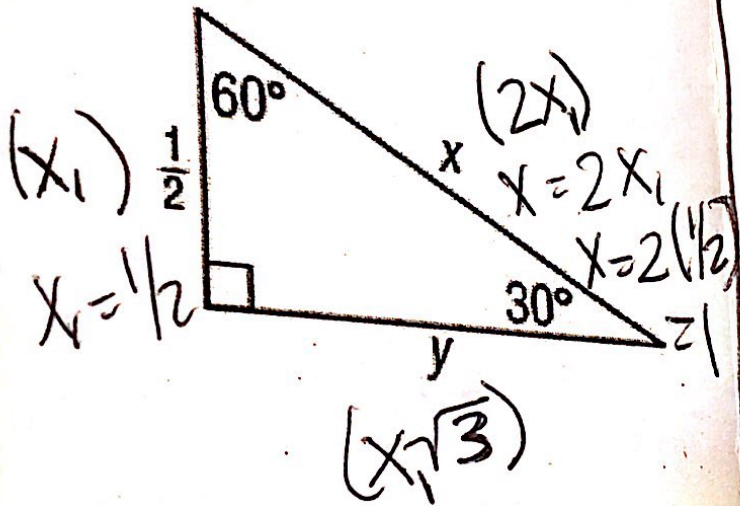
$$\frac{18}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{18\sqrt{3}}{3}$$

$$\boxed{6\sqrt{3}}$$



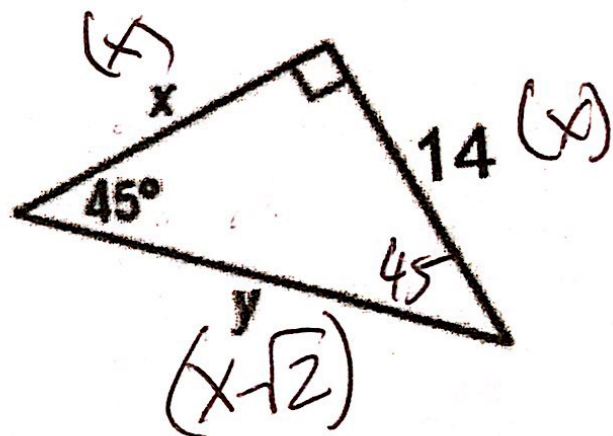


30-60-90 or 45-45-90  
 Side Length Ratios:  
 $x, x\sqrt{3}, 2x$



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

30-60-90 or 45-45-90  
 Side Length Ratios:  
 $x, x, x\sqrt{2}$



$x = 14$   
 $y = 14\sqrt{2}$

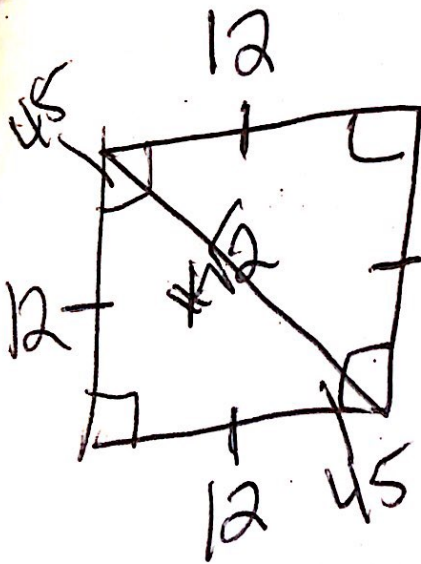


30-60-90 or 45-45-90

Side Length Ratios:

$X, X, X\sqrt{2}$

The perimeter of a square is 48 meters. Find the length of the diagonal.



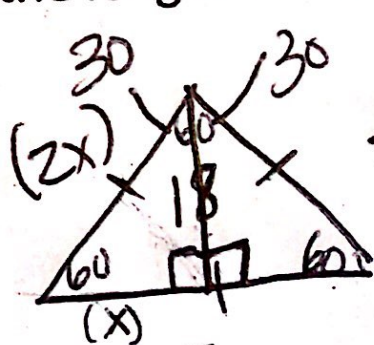
diagonal  
12  
12  
 $12\sqrt{2}$

30-60-90 or 45-45-90

Side Length Ratios:

$X, X\sqrt{3}, 2X$

The altitude of an equilateral triangle is 18 inches. Find the length of a side.



$$\frac{18}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$$

$$x = 6\sqrt{3}$$

Side =  $12\sqrt{3}$