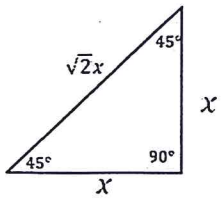
Bellwork Hon Alg 2 Thursday, May 4, 2017

Special Right Triangles

There are two right triangles that are referred to as Special Right Triangles

$45° - 45° - 90°$ Triangles

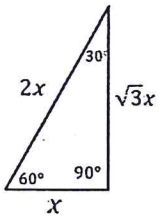


The two relationships that are true in ALL $45° - 45° - 90°$ Triangles are:

1. The two legs are congruent.
2. Hypotenuse = Leg $\cdot \sqrt{2}$

This is also called an Isosceles Right triangle because the two legs are congruent.

$30° - 60° - 90°$ Triangles

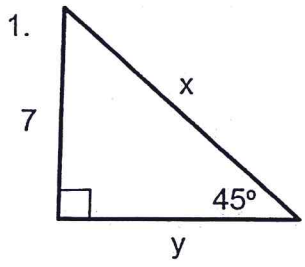


The two legs in a $30° - 60° - 90°$ Triangle are called the Short Leg and the Long Leg. The Short leg is always opposite the $30°$ angle and the Long Leg is always opposite the $60°$ angle. The two relationships that are true in ALL $30° - 60° - 90°$ Triangles are:

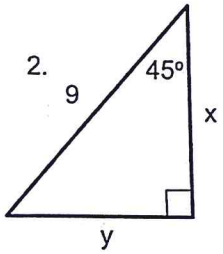
1. Short Leg = $\frac{1}{2}$ · Hypotenuse
2. Long Leg = Short Leg $\cdot \sqrt{3}$

Use these relationships in Special Right Triangles to find the EXACT value of the sides labelled x and y in each triangle.

1.



2.



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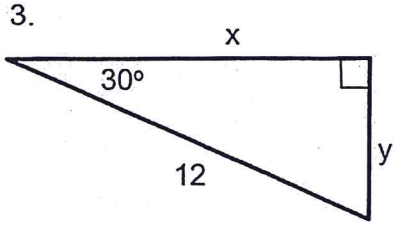

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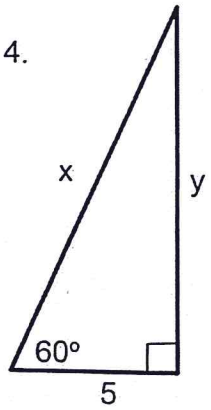

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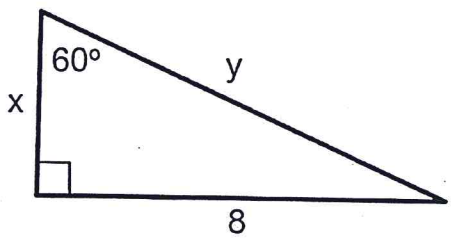

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Answers

Special Right Triangles

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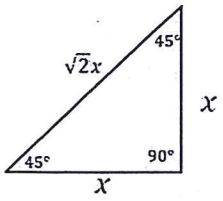

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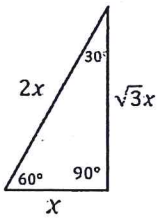

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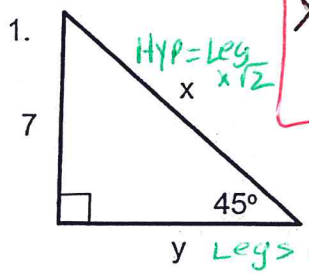


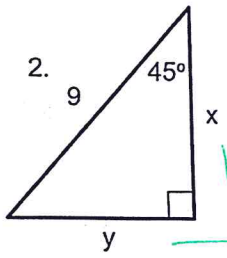
Hyp = Leg x $\sqrt{2}$

Legs are $\cong$

$x = 7\sqrt{2}$

$y = 7$

2.

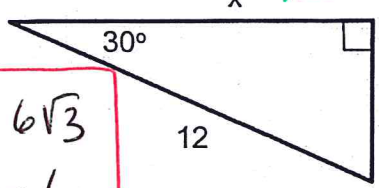


$x = \frac{9}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{9\sqrt{2}}{2}$

$y = \frac{9\sqrt{2}}{2}$

Leg = $\frac{\text{hypot}}{\sqrt{2}}$

3.



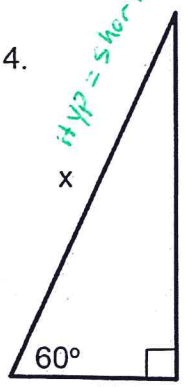
Long Leg = Short leg x $\sqrt{3}$

short leg = hyp ÷ 2

$x = 6\sqrt{3}$

$y = 6$

4.



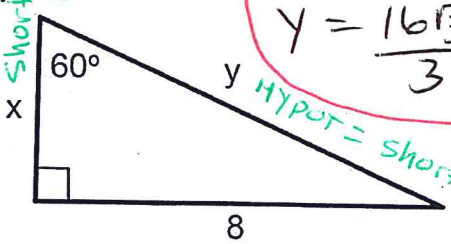
Hyp = short leg x 2

Long leg = short leg x $\sqrt{3}$

$x = 10$

$y = 5\sqrt{3}$

5.



short leg = Long leg ÷ $\sqrt{3}$

Hypot = short leg x 2

$x = \frac{8}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{8\sqrt{3}}{3}$

$y = \frac{16\sqrt{3}}{3}$