# 5-8

# Special Right Triangles

# Find side lengths for special right triangles

## OBJECTIVE

# ALGEBRA REVIEW

Rationalize the denominator:

1. $\frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$

2. $\frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \sqrt{3}$

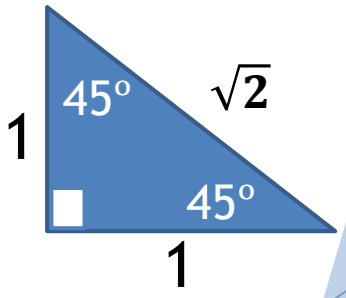
3. $\frac{3}{2\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{3\sqrt{5}}{2(5)} = \frac{3\sqrt{5}}{10}$

# KEY CONCEPT

45˚-45˚-90˚ Triangle Theorem:

In a 45˚-45˚-90˚ triangle (isosceles right Δ), both legs are congruent and the length of the hypotenuse is $\sqrt{2}$ times the length of a leg.

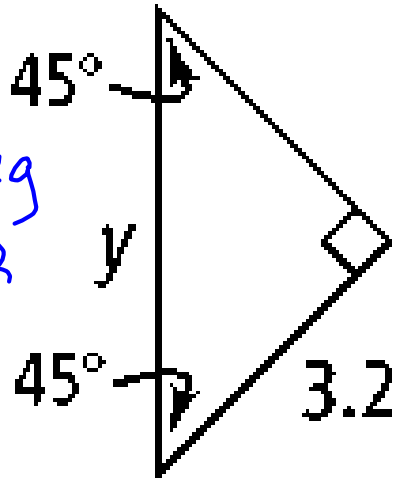
Hypotenuse = $\sqrt{2}$ • leg



# CLASS WORK

Find the value of each variable. If your answer is not an integer, express it in simplest radical form.

4.

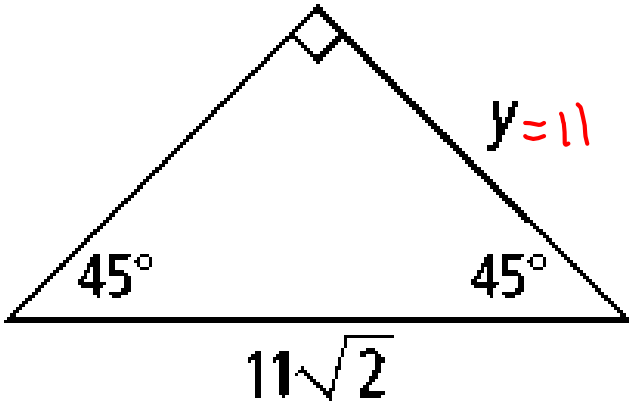



Hyp = √2 · leg

y = √2 · 3.2

y = 3.2√2

5.




Hyp = √2 · leg

$\frac{11\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2} \cdot y}{\sqrt{2}}$

y = 11

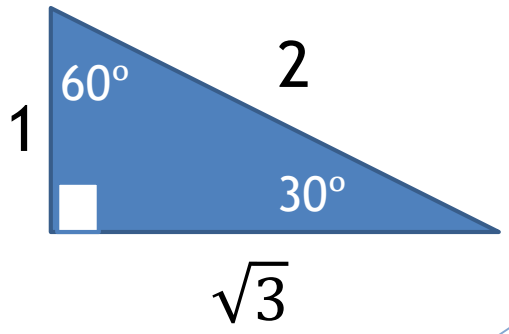
# KEY CONCEPT

30˚-60˚-90˚ Triangle Theorem:

In a 30˚-60˚-90˚ triangle, the length of the hypotenuse is twice the length of the shorter leg. The length of the longer leg is $\sqrt{3}$ times the length of the shorter leg.

Hypotenuse = 2 • short leg

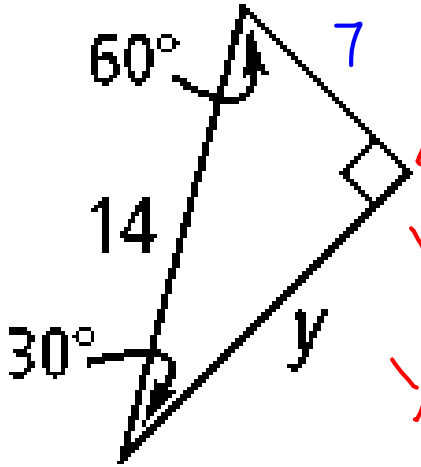
Long leg = $\sqrt{3}$ • short leg



# CLASS WORK

Find the value of each variable. If your answer is not an integer, express it in simplest radical form.

6.




Hyp = 2 · SL

14 = 2 · SL

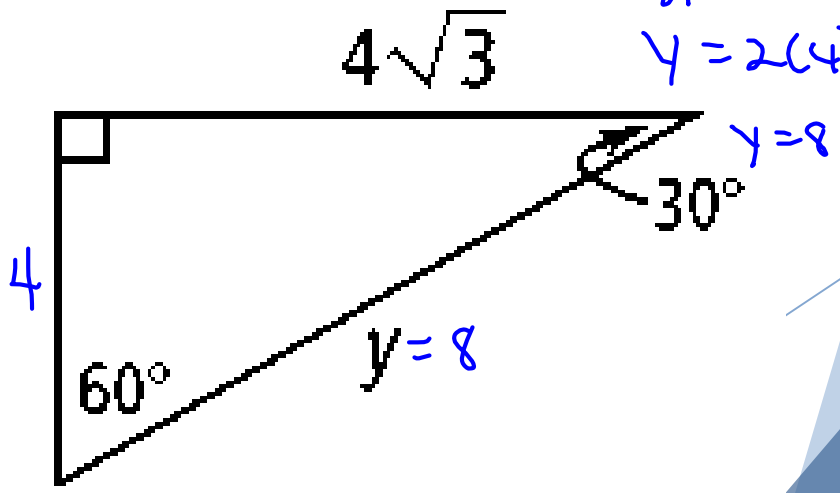
SL = 7

LL = √3 · SL

y = √3 · 7

y = 7√3

7.




Hyp = 2 · SL

y = 2(4)

y = 8

LL = √3 · SL

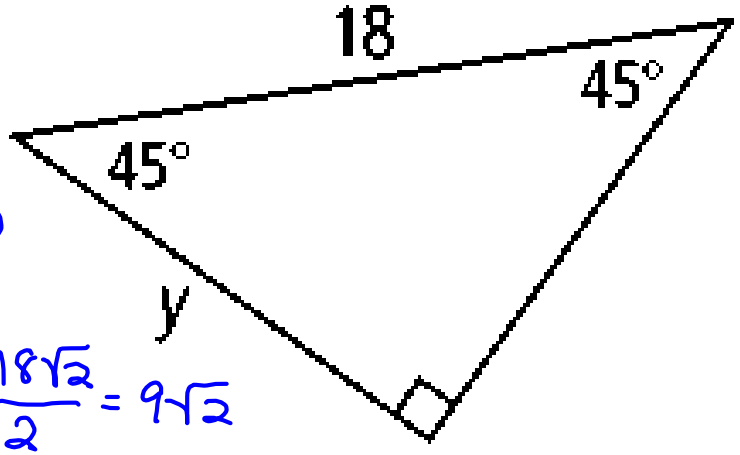
$\frac{4\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3} \cdot SL}{\sqrt{3}}$

SL = 4

# CLASS WORK

Find the value of each variable. If your answer is not an integer, express it in simplest radical form.

8.

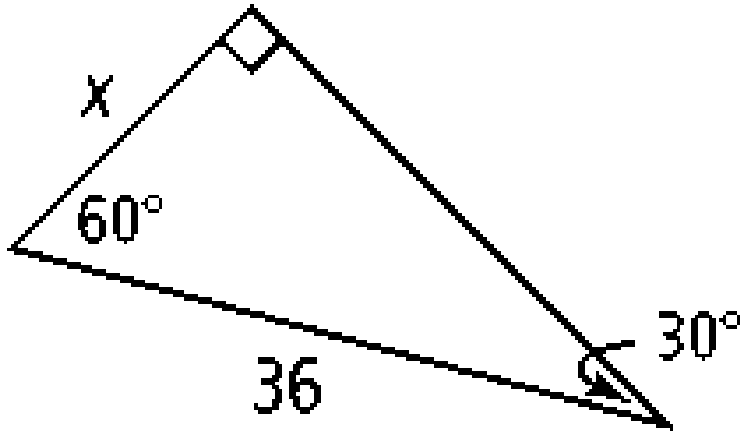



$Hyp = \sqrt{2} \cdot leg$

$18 = \sqrt{2} \cdot y$

$y = \frac{18}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{18\sqrt{2}}{2} = 9\sqrt{2}$

9.




$Hyp = 2 \cdot SL$

$36 = 2 \cdot x$

$x = 18$

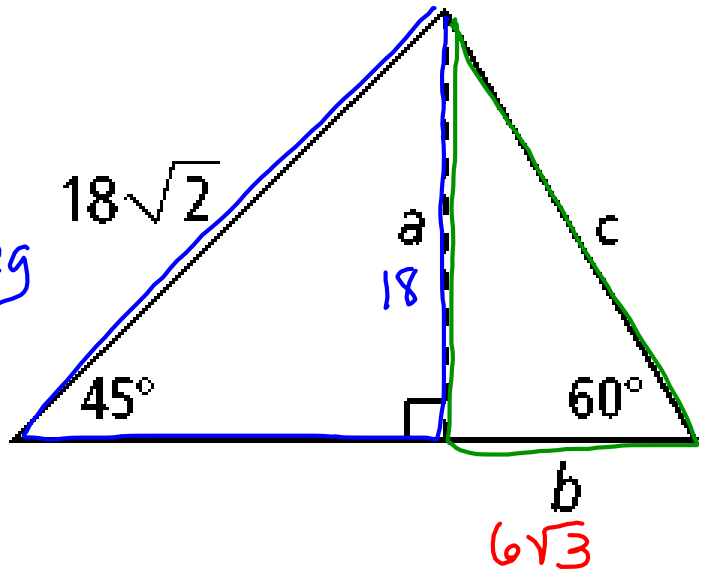
10.

# CLASS WORK

Hyp = √2 · leg

$18\sqrt{2} = \sqrt{2} \cdot a$

$a = 18$




Find the value of each variable. If your answer is not an integer, express it in simplest radical form.

LL = √3 · SL

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

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

$SL = 6\sqrt{3}$

Hyp = 2 · SL

$c = 2(6\sqrt{3})$

$c = 12\sqrt{3}$

# SUMMARY

45°-45°-90°triangle:

Hypotenuse = $\sqrt{2}$•leg

30°-60°-90° Triangle:

Hypotenuse = 2 • short leg

Long leg = $\sqrt{3}$ • short leg

# LEARNING RUBRIC

- Got It: To use special right triangle theorems to solve complex/real-world problems
- Almost There: To rationalize the denominator when using special right triangle theorems to find side lengths in triangles
- Moving Forward: To use special right triangle theorems to find side lengths in triangles
- Getting Started: To use the Pythagorean Theorem to find side lengths in 45-45-90 triangles

WS: 5-8 Practice (side 1)

# HOMEWORK