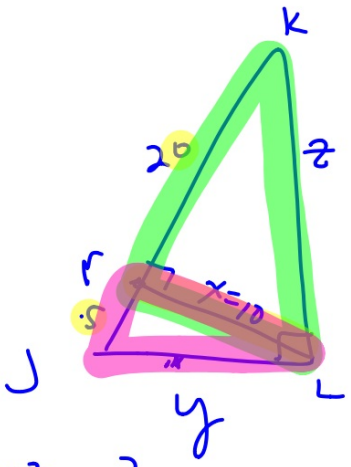


$\frac{5}{x} = \frac{x}{20}$

$\sqrt{x^2} = \sqrt{100}$

$x = 10$

$5^2 + 10^2 = y^2$

$25 + 100 = y^2$

$125 = y^2$

$10^2 + 20^2 = z^2$

$100 + 400 = z^2$

$500 = z^2$

$x = 10$

$y = 11.2$ $\sqrt{125}$

$z = 22.4$

$\sqrt{500}$

Geometry 8.3

Use the properties of 45-45-90 triangles

Use the properties of 30-60-90 triangles

Quiz 8.1-8.2 Tues.

isosceles

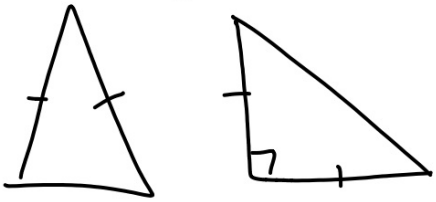
isosceles right triangle

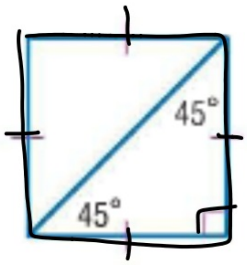
equilateral triangle

30-60-90 triangle

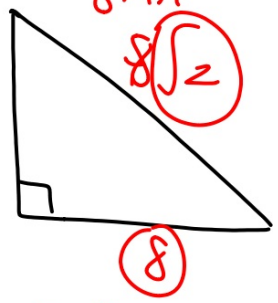
special right triangle

rationalizing the denominator (alg1)





Isosceles Right triangles
Look for patterns



$8 \cdot 1.4 = 12$

$8\sqrt{2}$

50
25 2
5 5

$5^2+5^2=h^2$

$25+25=h^2$

$\sqrt{50}=h$

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

5, 5, $5\sqrt{2}$

8, 8, $8\sqrt{2}$

$3^2+3^2=x^2$

$9+9=x^2$

$\sqrt{18}=\sqrt{x^2}$

$\sqrt{18}=x=\sqrt{2\cdot 3\cdot 3}=3\sqrt{2}$

$x, x, x\sqrt{2}$

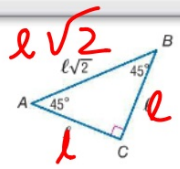
18
9 2
3 3

p 555 8

Theorem 8.8 45°-45°-90° Triangle Theorem

In a 45°-45°-90° triangle, the legs ℓ are congruent and the length of the hypotenuse h is $\sqrt{2}$ times the length of a leg.

Symbols In a 45°-45°-90° triangle, $\ell = \ell$ and $h = \ell\sqrt{2}$.

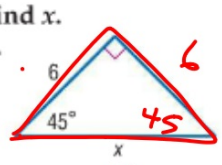


Why?

Example 1 Find the Hypotenuse Length in a 45°-45°-90° Triangle

Find x.

a.

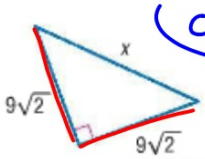


6

45

$6\sqrt{2}$

b.



$9 \cdot \sqrt{2}$

$\sqrt{4} = 2$

$(9\sqrt{2})\sqrt{2}$

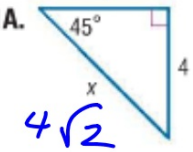
$9 \cdot 2$

18

GuidedPractice

Find x.

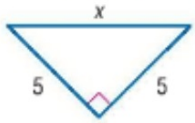
1A.



4

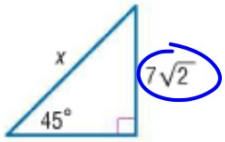
$4\sqrt{2}$

1B.



$5\sqrt{2}$

1C.



$7\sqrt{2 \cdot 2}$

$7 \cdot 2$ $\sqrt{4}$

14

30-60-90

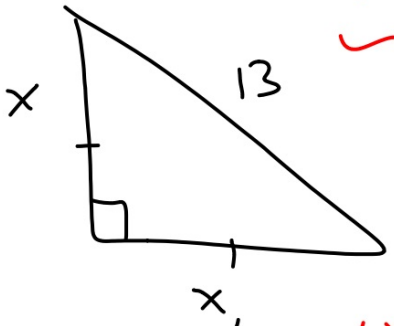
$x, x, x\sqrt{2}$

$12 = x\sqrt{2}$

$\frac{\sqrt{2}}{\sqrt{2}\sqrt{2}}12 = \frac{x\cdot\sqrt{2}}{\sqrt{2}}$

$\frac{12\sqrt{2}}{2} = 1x$

$6\sqrt{2} = x$



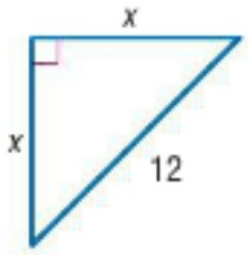
$\frac{13}{\sqrt{2}} = x\left(\frac{\sqrt{2}}{\sqrt{2}}\right)\left(\frac{\sqrt{2}}{\sqrt{2}}\right)\frac{13}{\sqrt{2}}$ $\therefore x = \frac{13\sqrt{2}}{2}$

p 562 1-17 odd 29, 31, 33

Example 2 Find the Leg Lengths in a 45°-45°-90° Triangle

Find x.

The legs of this right triangle have the same measure, x, so it is a 45°-45°-90° triangle. Use Theorem 8.8 to find x.

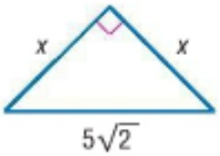


Review Vocabulary

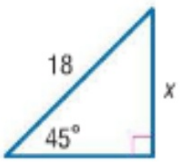
rationalizing the denominator a method used to eliminate radicals from the denominator of a fraction

GuidedPractice

2A.



2B.



30-60-90 Triangles
Look for patterns

Started out as equilateral

StudyTip

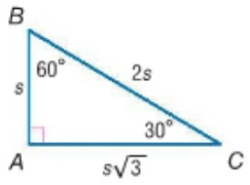
Use Ratios The lengths of the sides of a 30°-60°-90° triangle are in a ratio of 1 to $\sqrt{3}$ to 2 or $1 : \sqrt{3} : 2$.

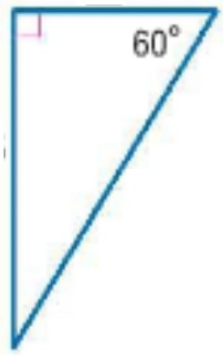
This algebraic proof verifies the following theorem.

Theorem 8.9 **30°-60°-90° Triangle Theorem**

In a 30°-60°-90° triangle, the length of the hypotenuse h is 2 times the length of the shorter leg s, and the length of the longer leg ℓ is $\sqrt{3}$ times the length of the shorter leg.

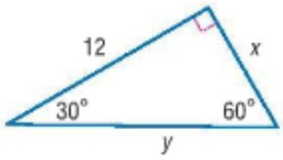
Symbols In a 30°-60°-90° triangle, $h = 2s$ and $\ell = s\sqrt{3}$.



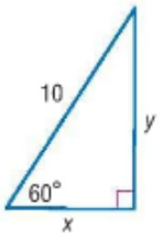


Label each angle
Which side is largest (always)?
Smallest?
Medium?

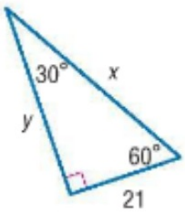
GuidedPractice



3B.

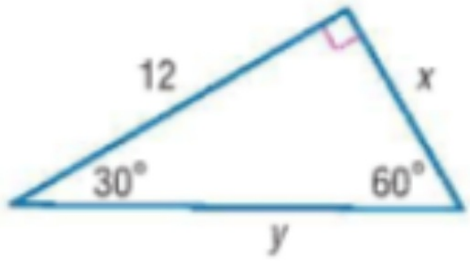


3C.



Find x and y.

3A.



Example 3 Find Lengths in a 30°-60°-90° Triangle

Find x and y.