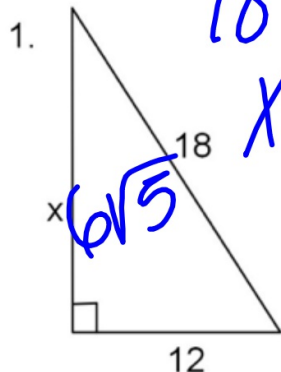Find the missing side in each triangle. For non-integer answers, leave them in simplest radical form.
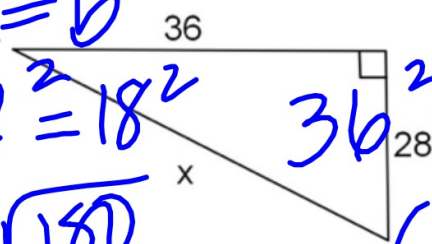
1.

$18^2 - 12^2 = b^2$

$x^2 + 12^2 = 18^2$

$b^2 = \sqrt{180}$

$3 \cdot 5$

$6\sqrt{5}$

18

x

12

2.

36

$36^2 + 28^2 = c^2$

$c^2 = \sqrt{2080}$

16 130

$4\sqrt{130}$

28

x

3. Does each set of lengths form a right triangle?

a. 16, 30, 34

$34^2 = 30^2 + 16^2$

$1156 = 1156$

yes

b. 11, 59, 61

$61^2 \neq 59^2 + 11^2$
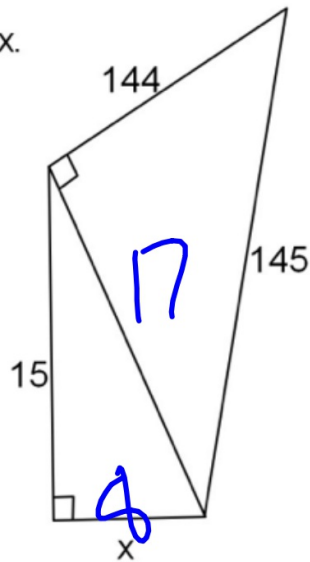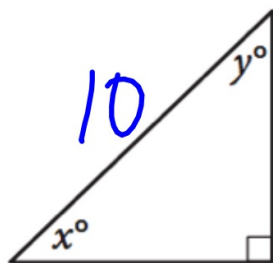
NO.

4. Is this a Pythagorean Triple?

14, 48, 50

$$50^2 = 48^2 + 14^2$$
$$2500 = 2500 \quad \text{yes.}$$

5. Find the value of x.

144

17 145

15

x

$$145^2 - 144^2$$

$$17^2 - 15^2$$

6.

10 · $y°$ · 6

SOH CAH TOA

$\sin x = \dfrac{opp}{hyp}$ $\dfrac{6}{10}$

In the triangle above, the sine of angle x is 0.6.
What is the cosine of angle y?

$\cos y = \dfrac{adj}{hyp}$

$\boxed{\dfrac{6}{10}}$

$x°$

7.

$$f(x) = 2^x + 1$$

The function f is defined by the equation above.
Which of the following is the graph of $y = -f(x)$ in
the xy-plane?

$\boxed{C}$

$f(x) = -2^x - 1$

$f(0) = -2^0 - 1$

$= -1 - 1 = \boxed{-2}$

Geometry   8-2: Special Right Triangles

Objective 1: I can find side lengths of a $45° - 45° - 90°$ **triangle.**

In an isosceles right triangle, both acute angles are ___≅___. Another name for an isosceles right
triangle is a ___45 45 90___ because of the measures of the angles. The
theorem we're going to look at today shows the relationship among the 3 sides of this triangle.

Theorem 8-5: $45° - 45° - 90°$ **Triangle Theorem**

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

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

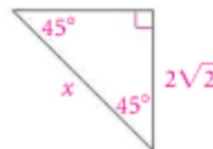---

Finding the hypotenuse of a $45° - 45° - 90°$ triangle.
Example 1: Finding the length of each variable.

A)

$$h = 9\sqrt{2}$$

B)

$$x = 2\sqrt{2} \cdot \sqrt{2}$$
$$= 4$$
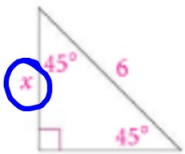
QC 1: Find the length of the hypotenuse of a $45° - 45° - 90°$ triangle with legs of length $5\sqrt{3}$.

$$\text{hyp} = 5\sqrt{6}$$

Finding the leg of a $45° - 45° - 90°$ triangle.

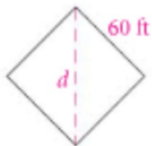Example 2: Find each variable.

A)

$$6 = \sqrt{2} \cdot X$$

$$X = \frac{6}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{2}}{2}$$

$$= 3\sqrt{2}$$

B) Find the length of a leg of a $45° - 45° - 90°$ triangle with a hypotenuse of length 10.

$$10 = \sqrt{2} \cdot x$$

$$x = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{10\sqrt{2}}{2}$$

$$= 5\sqrt{2}$$

Example 3: A high school softball diamond is a square. The distance from base to base is 60 ft. To the nearest foot, how far does a catcher throw the ball from home plate to second base?

60 ft

$$d = 60 \cdot \sqrt{2}$$

$$= 85 ft$$

QC 3: A square garden has sides 100 ft long. You want to build a brick path along a diagonal of the square. How long will the path be? Round your answer to the nearest foot.

$$d = 100\sqrt{2}$$
$$= 141 ft$$

Objective 2: I can find side lengths of a $30° - 60° - 90°$ **triangle**

Another special type of right triangle is a $30° - 60° - 90°$ triangle. Today we will look at the relationship among the 3 sides of this triangle.

Theorem 8-6: $30° - 60° - 90°$ **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.
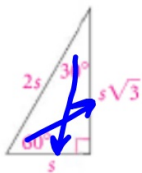
$$hyp = 2 \cdot short\ leg$$
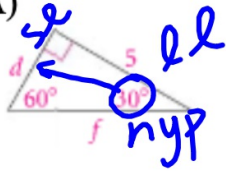$$ll = \sqrt{3} \cdot short\ leg$$

$$sl = \frac{hyp}{2}$$

$$sl = \frac{ll}{\sqrt{3}}$$
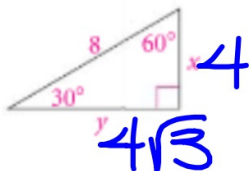
Example 4: Find the value of each variable.

A)

$$5 = \sqrt{3} \cdot d$$

$$d = \frac{5}{\sqrt{3}} = \frac{5\sqrt{3}}{3} \cdot \frac{2}{1}$$
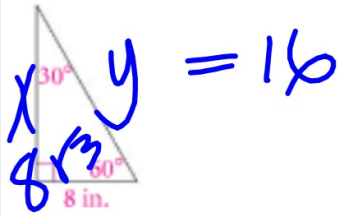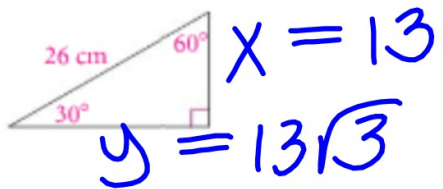
$$f = \frac{10\sqrt{3}}{3}$$

B)

$$8 = 2x$$
$$x = 4$$

C)

30°

x

$y = 16$

$8\sqrt{3}$

60°

8 in.

D)

26 cm   60°

30°

$x = 13$

$y = 13\sqrt{3}$

Hwk #14 -

Sec 8-2,

Pages 428-429,

Problems 2-5, 8, 11-13, 18, 22

IXL #9 - Q.1 & Q.4 due Friday by 4pm!