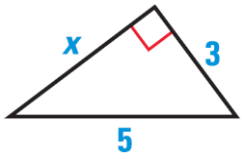
Geometry

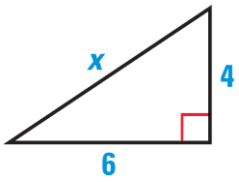
9.1 The Pythagorean Theorem

Pythagorean Theorem

In a _____ triangle, _____ where *a* and *b* are the length of the _____ and *c* is the length of the _____.

Find the value of x





Pythagorean Triples

A set of _____ positive integers that satisfy the _____ Theorem

_____ _____ _____ _____

Converse of the Pythagorean Theorem

If _____ where *a* and *b* are the length of the _____ sides and *c* is the length of the _____ side, then it is a _____ triangle.

Tell whether a triangle with the given sides is a right triangle.

4, $4\sqrt{3}$, 8

If c is the _____ side and…

$c^2 < a^2 + b^2$ → _____ triangle

$c^2 = a^2 + b^2$ → _____ triangle

$c^2 > a^2 + b^2$ → _____ triangle

Show that the segments with lengths 3, 4, and 6 can form a triangle

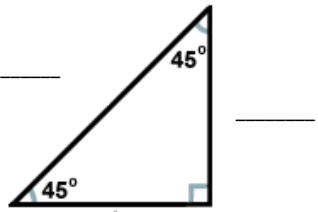
Classify the triangle as *acute*, *right* or *obtuse*.

Assignment: 452 #2, 4, 6, 7, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 43, 45, 48, 49, 53 = 20 total

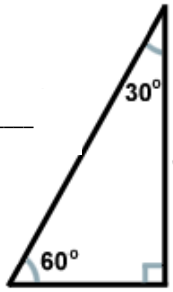
Geometry

9.2 Special Right Triangles

45°-45°-90°

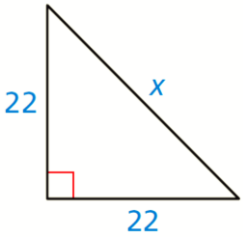


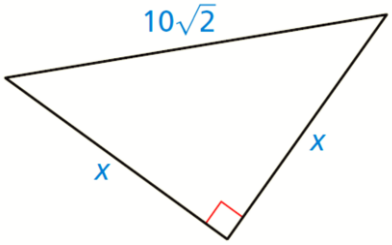
30°-60°-90°



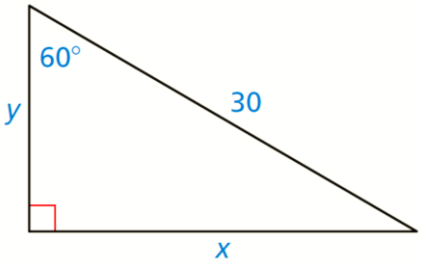
If you have another 45°-45°-90° or 36°-60°-90° triangle, then use the fact that they are _____ and use the _____ sides.

Find the value of *x*. Write your answer in simplest form.





Find the values of *x* and *y*. Write your answers in simplest form.



Assignment: 459 #1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 24, 25, 26, 30, 32 = 20 total

Geometry

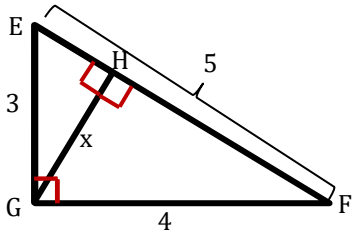
9.3 Similar Right Triangles

Right Triangle Similarity Theorem

If the _____ is drawn to the _____ of a right triangle, then the two triangles formed are _____ to the _____ triangle and to _____.

$\Delta CBD \sim \Delta ABC$, $\Delta ACD \sim \Delta ABC$, $\Delta CBD \sim \Delta ACD$

Identify the similar triangles. Then find *x*.



Geometric Mean

The geometric mean of two positive numbers _____ and _____ is the positive number that satisfies $\frac{a}{x} = \frac{x}{b}$. So,

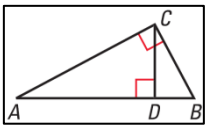
_____

Find the geometric mean of 8 and 10.

Geometric Mean (Altitude) Theorem

If the altitude is drawn to the hypotenuse of a right triangle, then the _____ is the _____ _____ of the two _____ of the _____.

$\boldsymbol{CD = \sqrt{AD \cdot DB}}$

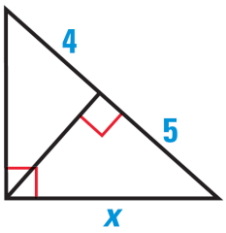


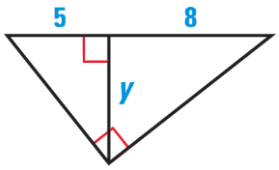
Geometric Mean (Leg) Theorem

If the altitude is drawn to the hypotenuse of a right triangle, then each _____ is the _____ _____ of the _____ and the _____ of the _____ adjacent to that leg.

$\boldsymbol{AC = \sqrt{AB \cdot AD}}$ **and** $\boldsymbol{BC = \sqrt{AB \cdot DB}}$

Find the value of x or y.





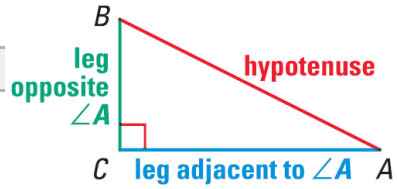
Assignment: 466 #2, 4, 6, 8, 10, 12, 14, 18, 20, 22, 24, 27, 30, 32, 36, 43, 47, 48, 49, 50 = 20 total

Geometry

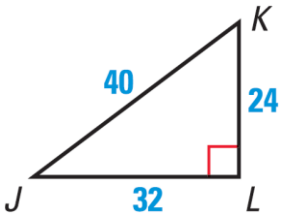
9.4 The Tangent Ratio

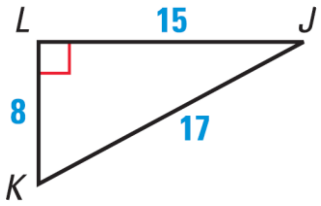
Tangent ratio

$$\tan A = \frac{leg}{leg}$$

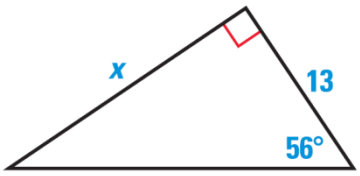


Find tan J and tan K.





Find the value of x. Round to the nearest tenth.



Assignment: 473 #2, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 18, 20, 24, 25, 29, 30 ,32 = 20 total

Geometry

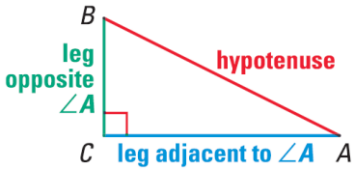
9.5 The Sine and Cosine Ratios

Sine and Cosine Ratios

$$\sin A = \frac{leg}{\text{———}}$$

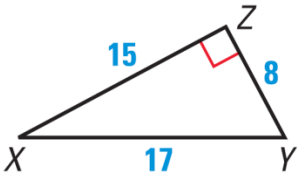
$$\cos A = \frac{leg}{\text{———}}$$

$$\tan A = \frac{leg}{leg}$$



S O H
C A H
T O A

Find sin *X*, cos *X*, and tan *X*



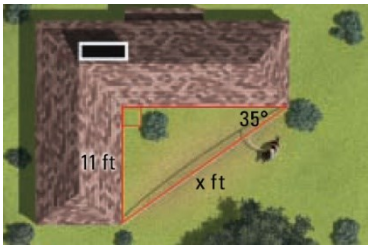
Sine of an angle = cosine of the complement

$\sin A = \cos(90° - A) = \cos B$

$\cos A = \sin(90° - A) = \sin B$

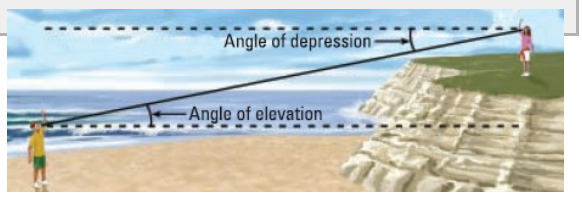
Write cos 68° in terms of sine.

Find the length of the dog run (*x*).



Geometry 9.5 Name: _____

Angle of Elevation and Depression



Both are measured from the _____

Since they are measured to _____ lines, they are _____

The angle of elevation of a plane as seen from the airport is 50°. If the plane's 1000 ft away, how high is plane?

Assignment: 480 #2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 27, 28, 30, 35, 38, 41, 44, 45, 48 = 20 total

Geometry

9.6 Solving Right Triangles

Solve a Triangle

Solve a triangle means to find _____ the unknown _____ and _____.

- Can be done for a _____ triangle if you know
  - _____
  - _____
- Use _____, _____, _____, _____ Theorem, and _____ Theorem

Inverse Trigonometric Ratios

Used to find measures of _____ when you know the _____.

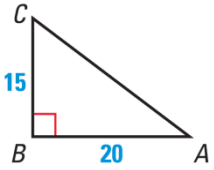
sin^{-1} _____ $= \theta$

cos^{-1} _____ $= \theta$

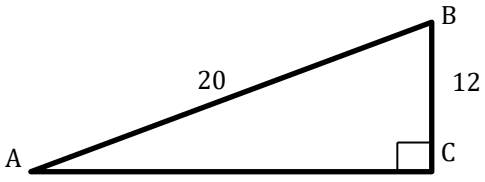
tan^{-1} _____ $= \theta$

Find $m\angle D$ to the nearest tenth if $sin\ D = 0.54$

Find $m\angle C$ to the nearest tenth.



Solve a right triangle that has a 12-inch leg and a 20-inch hypotenuse.



Assignment: 487 #2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 30, 33, 34, 35, 39 = 20 total

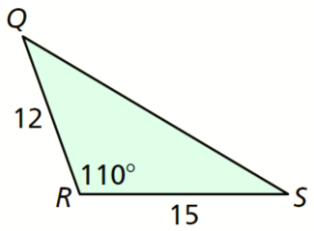
Geometry

9.7A Law of Sines

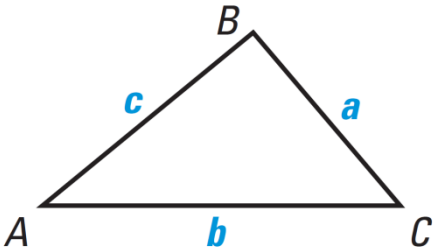
Area of a Triangle

_____ _____ _____

Find the area of the triangle.



Tangent, Sine, and Cosine are only for _____ triangles
Law of Sines and Law of Cosines are for _____ triangle



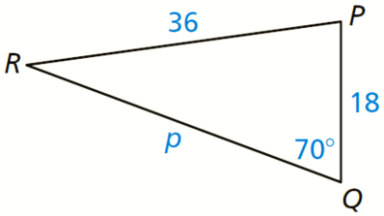
Law of Sines

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

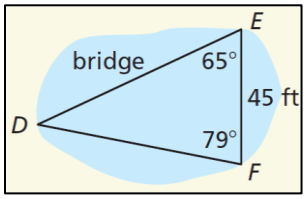
Used if you know

- _____
- _____
- _____

Solve the triangle.



A surveyor makes the measurements shown to determine the length of a walking bridge to be built across a pond in a city park. Find the length of the bridge.



Assignment: 495 #2, 4, 6, 8, 10, 12, 14, 16, 18, 20 = 10 total

Geometry

9.7B Law of Cosines

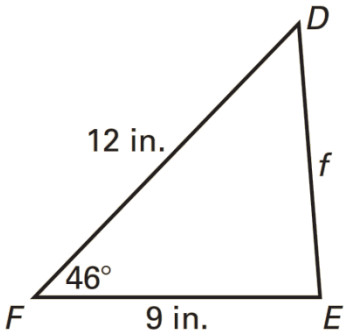
Law of Cosines

$$a^2 = b^2 + c^2 - 2bc\cos A$$
$$b^2 = a^2 + c^2 - 2ac\cos B$$
$$c^2 = a^2 + b^2 - 2ab\cos C$$

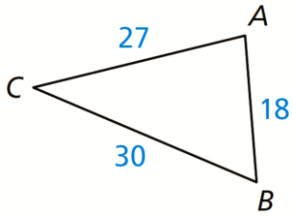
Use when you know

- _____
- _____

Solve the triangle.



Solve the triangle.

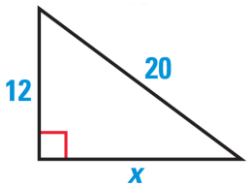


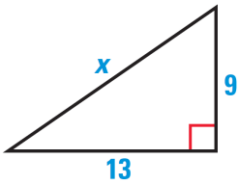
Assignment: 495 #22, 24, 26, 28, 32, 56, 57, 58, 59, 64 = 10 total

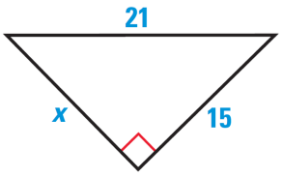
Name: _____

Geometry Chapter 9 Review

Find the value of *x*. Write your answer in simplest radical form.

1. 

2. 

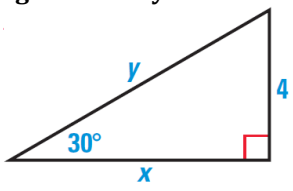
3. 

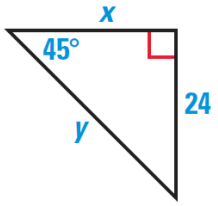
Classify the triangle as *acute*, *right*, or *obtuse*.

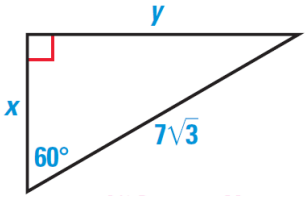
4. $5, 15, 5\sqrt{10}$

5. 4.3, 6.7, 8.2

Find the value of each variable using the special right triangles. Write your answer in simplest radical form.

6. 

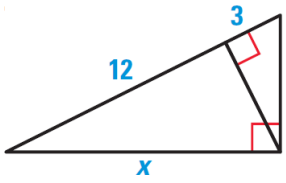
7. 

8. 

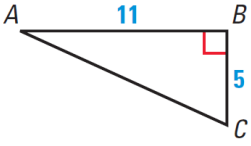
9. What is the geometric mean of 2 and 21?

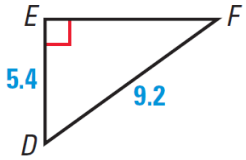
Find the exact value of *x*. (Use fractions and simplest radical form.)

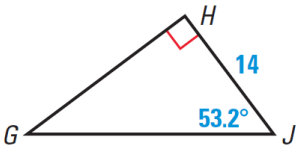
10. 

11. 

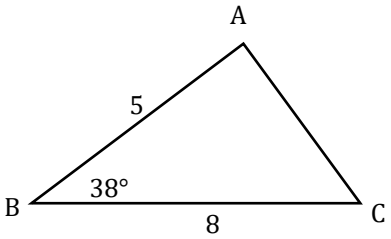
Solve the right triangle. Round your answers to the nearest tenth.

12. 

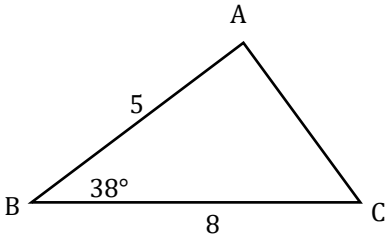
13. 

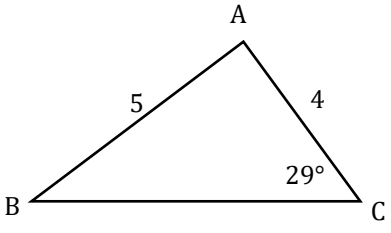
14. 

Find the area of ΔABC. Round to the nearest tenth if necessary.

15. 

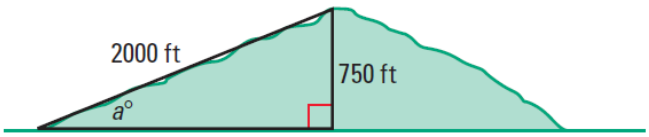
Solve the triangle. Round to the nearest tenth.

16. 

17. 

Name: _____

18. The length of a hill in your neighborhood is 2000 feet. The height of the hill is 750 feet. What is the angle of elevation of the hill?



Answers

1. 16
2. $5\sqrt{10}$
3. $6\sqrt{6}$
4. Right
5. Obtuse
6. $4\sqrt{3}$; 8
7. 24; $24\sqrt{2}$
8. $\frac{7\sqrt{3}}{2}$; $\frac{21}{2}$
9. $\sqrt{42}$
10. 10
11. $6\sqrt{5}$
12. $A \approx 24.4°, C \approx 65.6°, AC \approx 12.1$
13. $D \approx 54.1°, F \approx 35.9°, EF \approx 7.4$
14. $G = 36.8°, GH \approx 18.7, GJ \approx 23.4$
15. 12.3
16. $A = 104.8°$, $b = 5.1$, $C = 37.2°$
17. $a = 8.1$, $A = 128.2°$, $B = 22.8°$
18. About 22°