Geometry
Ch. 9B: HW #5 Trig Practice

Name: _____
Period: _____

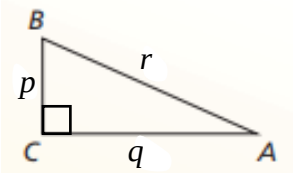
Core Concept

Sine and Cosine of Complementary Angles

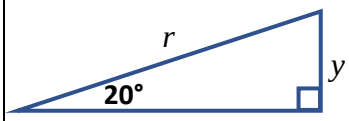
The sine of an acute angle is equal to the cosine of its complement. The cosine of an acute angle is equal to the sine of its complement.

Let A and B be complementary angles. Then the following statements are true.

$$\sin A = \cos(90° - A) = \cos B \qquad \sin B = \cos(90° - B) = \cos A$$



$A + B =$ ____
$\sin(A) =$
$\cos(B) =$

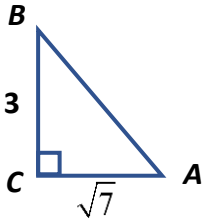
2) $\sin(20°) = \cos(\quad)$ 	3) $\cos(50°) = \sin(\quad)$ 	4) $\cos(10°) - \sin(80°) =$ _____
5) $\sin(25°) = \cos(\quad)$	6) $\cos(10°) = \sin(\quad)$	7) $\dfrac{\sin(30°)}{\cos(60°)} =$ ____

Complete the following problems on separate paper. Draw a diagram for each.

1) A firefighter is rescuing a cat in a tree. If the branch that the cat is on is 15 feet above the ground and the ladder makes an angle of 63° with the ground, how long is the ladder?	2) A cable that is 245 feet long is used to support a flag pole. If the angle that the cable makes with the ground is 78°, how long is pole?
3) A surveyor needs to find out how far away she is from a 3000 foot cliff. Looking up at the cliff, the angle of elevation is 22°. How far is she from the base of the cliff.	4) At a location 50 meters from the base of a tree, the angle of elevation is 33°. Determine the height of the tree.
5) A ladder safe if the angle if makes with ground is 80°. How far should a 20 foot ladder be placed from the base of the wall.	6) From the top of a building, you look down at an object on the ground. If your eyes are 55 feet above the ground and angle of depression is 50°, how far away (line of sight distance) is the object?
7) A truck traveled 1600 m down a hill. If it is now 64 m below the starting point, what is the angle of depression from the starting point to the truck?	8) A building 14.5 meters tall casts a shadow of 11.4 meters along level ground. What is the angle of elevation of the sun at that time?
9) A train travels 100 meters on an uphill track. If the train gained 5 meters in elevation, what is the angle of elevation of the track.	10) A lighthouse built at sea level is 150 feet high. From its top, the angle of depression to a buoy is 25°. Find the distance from the buoy to the foot of the lighthouse.

Practice Quiz

1) Use the Pythagorean Theorem to find the missing side length. Find each trig ratio. Leave answers in simple radical form, no decimals.

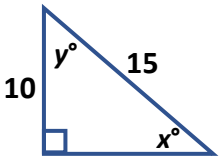


$\sin(A)$ =

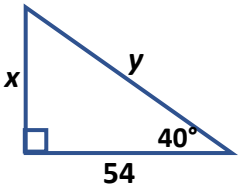
$\cos(A)$ =

$\tan(A)$ =

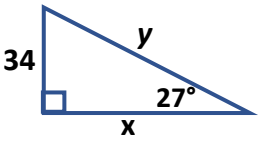
2) Find the value of *x* and *y*.



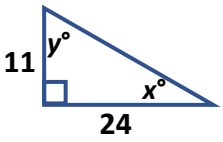
3) Find the value of *x* and *y*.



4) Find the value of *x* and *y*.

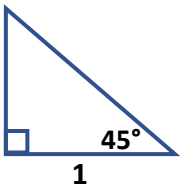


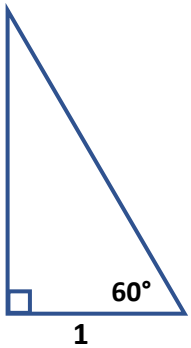
5) Find the value of *x* and *y*.



6) A lighthouse built at sea level is 90 feet high. From its top, the angle of depression to a boat is 15°. Find the distance from the boat to the top of the lighthouse.

7) Fill in the missing sides on the special right triangles:





8) Find the exact (no decimals approximations) value of each expression. Leave answer in simple radical form.

a) $\sin(30°)+\tan(45°)$ b) $\cos(45°)\tan(30°)$

9) Which one of the following is true?

a) $\cos(70°)=\sin(70°)$

b) $\cos(20°)=\sin(20°)$

c) $\cos(20°)=\sin(70°)$

10) Fill in the blank to make each statement true.

a) $\cos(60°)=\sin(\quad°)$

b) $\sin(48°)=\cos(\quad°)$