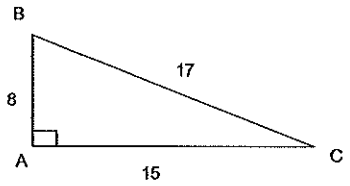
Geometry 21 Name _____

Applications of Trigonometry

8.3-8.4

Use the diagrams below to solve;

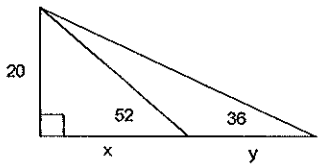
1)



sin B = $\frac{15}{17}$ cos B = $\frac{8}{17}$ tan B = $\frac{15}{8}$

m∠B = 61.9° m∠C = 28.1° $\sin C = \frac{8}{17}$

2)

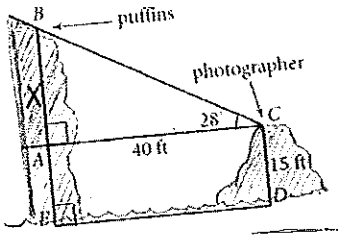


27.53

$\tan 52 = \frac{20}{x}$ $\tan 36 = \frac{20}{w}$ x = 15.63 y = 11.90

3)

An ornithologist is taking pictures of puffins on the edge of a cliff. To find the hight of the puffins above the water, she measures a 28 **angle of elevation** of her line of sight to the puffins. If her position is about 15 feet above the water and about 40 feet from the cliff, how high above the water are the puffins?

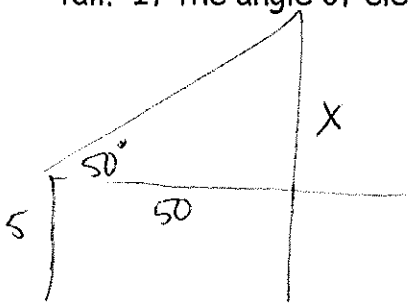


$\tan 28 = \frac{x}{40}$

21.27 + 15

The puffins are about 36.27 above the water.

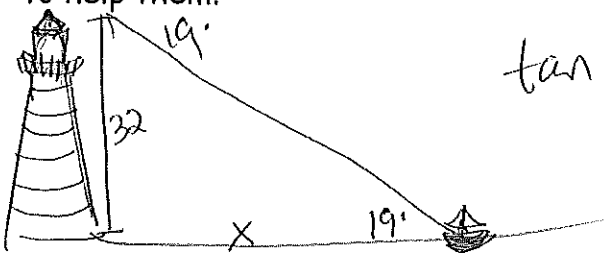
4) An engineer stands 50 feet away from a building and sights the top of the building with a surveying device mounted on a tripod that is 5 feet tall. If the angle of elevation is 50° , how tall is the building?



$\tan 50 = \frac{x}{50}$ 59.59 + 5

The building is about 64.59ft tall.

5) A lighthouse is 32 feet tall and someone at the top of the lighthouse sees a boat that needs help. The **angle of depression** from the top of the lighthouse is 19 . How far will the person have to row to get to the boat to help them?

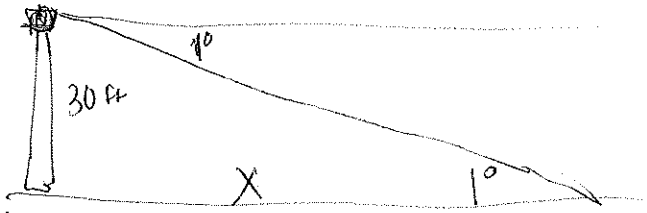


$\tan 19 = \frac{32}{x}$

x = 92.93 ft

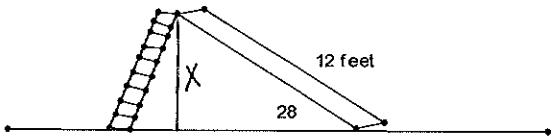
6) The height of an observation tower in a state park is 30 feet. A ranger at the top of the tower sees a fire along a line of sight that is at a 1 degree angle of depression. How far is the fire from the base of the tower?

$\tan 1° = \frac{30}{x}$



The fire is 1718.7 feet from the base of the tower.

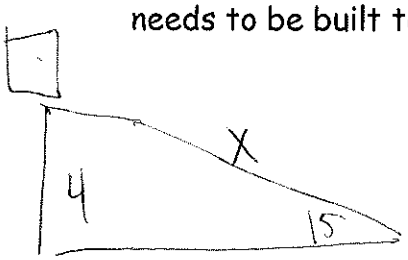
6) A slide is 12 feet long and meets the ground at a 28 degree angle.



$\sin 28 = \frac{x}{12}$

The slide is about 5.63 feet tall.

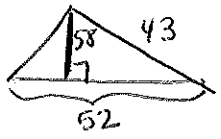
7) A handicap ramp needs to meet the ground at a 15 degree angle. A ramp needs to be built to a door that is 4 feet off the ground.



The ramp must be 15.45 feet long.

$\sin 15 = \frac{4}{x}$

8) Area of given triangle:



$A = \frac{1}{2}bh$

$\frac{1}{2}(52)h$

$\frac{1}{2}(52)(22.79) = 592.45\ ft^2$

$h \Rightarrow \frac{\cos 58}{1} = \frac{h}{43}$

$43 \cos 58 = 22.79 = h$