

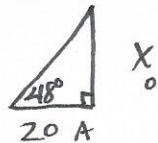
STEM Analytic Geometry
 Homework - Applications of Trig (Side Lengths)

Name HW 2/25/14
 Date _____

MGSE9-12.G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Round all answers to the nearer hundredth.

1. At a point 20 meters from a flagpole, the angle of elevation of the top of the flagpole is 48° . How tall is the flagpole?



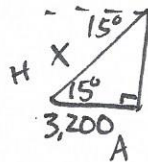
$$\tan 48^\circ = \frac{x}{20}$$

$$20 \tan 48^\circ = x$$

$$22.21 \approx x$$

22.21m

2. A woman looks out from the top of a cliff to the ocean below. In the distance is a boat. If the boat is 3200 feet from the base of the cliff and the angle of depression to the boat is 15° , what is the direct distance from the woman to the boat?



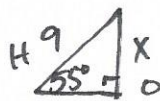
$$\cos 15^\circ = \frac{3,200}{x}$$

$$\frac{x \cos 15^\circ}{\cos 15^\circ} = \frac{3,200}{\cos 15^\circ}$$

$$x \approx 3,312.88$$

3,312.88 ft.

3. As it leans against a building, a 9-meter ladder makes an angle of 55° with the ground. How far up the building does the ladder reach?



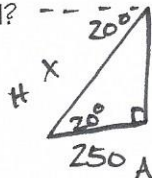
$$\sin 55^\circ = \frac{x}{9}$$

$$9 \sin 55^\circ = x$$

$$7.37 \approx x$$

7.37m

4. An owl is located in a huge oak tree and sees a food bowl for dogs in the distance. If the base of the tree is 250 feet from the food bowl, and the angle of depression from the owl is 20° , then what is the direct distance from the owl to the food bowl?



$$\cos 20^\circ = \frac{250}{x}$$

$$\frac{x \cos 20^\circ}{\cos 20^\circ} = \frac{250}{\cos 20^\circ}$$

$$x \approx 266.04$$

266.04 ft.

5. A flagpole is at the top of a building. 400 ft from the base of the building, the angle of elevation of the top of the pole is 22° and the angle of elevation of the bottom of the pole is 20° . Determine the length of the flagpole (to the nearest foot).

$$\tan 20^\circ = \frac{x}{400}$$

$$400 \tan 20^\circ = x$$

$$145.59 \approx x$$

$$\tan 22^\circ = \frac{y}{400}$$

$$400 \tan 22^\circ = y$$

$$161.61 \approx y$$

$$161.61 - 145.59 = 16.02$$

16 ft.

