Name: _____

## 9.2 – 9.5.D3: Angles of Elevation/Depression   Past due on: _____ Period: _____

For each problem below, draw a diagram that represents the scenario and then write a trigonometric equation; finally, solve.

1. You are measuring the height of a Sitka spruce tree in Alaska. You stand 45 feet from the base of the tree and measure the angle of elevation from a point on the ground to the top of the tree to be 59°. Find the height of the tree to the nearest foot.

2. The ground crew for a hot-air balloon can see the balloon in the sky at an angle of elevation of 11°. The pilot radios to the crew that the hot-air balloon is 316 meters above the ground. Use a trigonometric ratio to estimate the horizontal distance, d, of the hot-air balloon from the ground crew. Approximate your answer to the nearest tenth of a meter.

3. Suppose you stand at the top of a ski slope and look down at the bottom. The angle that your line of sight makes with a line drawn horizontally is called the angle of depression, as shown below.

    a. The vertical drop is the difference in the elevations of the top and bottom of the slope. Find the vertical drop, x, of the slope in the diagram.
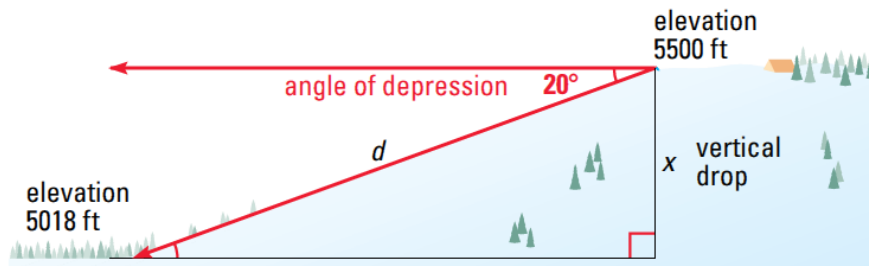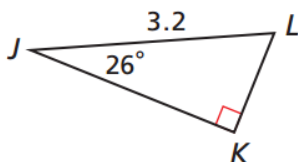

    b. Use a trigonometric ratio to estimate the distance, d, a person skiing would travel on this slope. (Round to the nearest tenth of a foot.)

4. The top row of the red seats behind home plate at Cincinnati's Riverfront Stadium is 30 yards above the level of the playing field. The angle of depression to the base of the left field wall is 14°. How far is the base of the left field wall from a point directly below the top row?

5. The angle of depression from the top of the Kenosha Lighthouse 120 feet above the surface of the water to a buoy is 10°. How far is the buoy from the lighthouse?
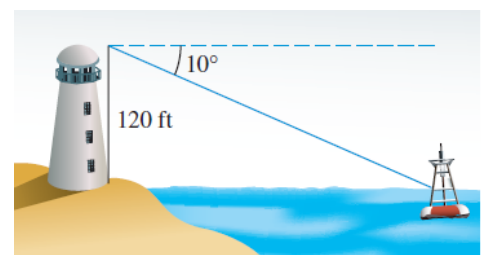
6. From a point 65 feet from the base of a telephone pole stands a concerned mother, the angle of elevation to her son working on the pole is 55°. If he became the unlucky recipient of an electric shock, he'd fall straight down said pole. How many feet would he drop?

7. The tallest freestanding structure in the world is the 553-meter tall CN tower in Toronto, Ontario. Suppose that at a certain time of day it casts a shadow 1100 meters long on the ground. What is the angle of elevation of the sun at that time of day?

8. A ramp for wheel chair accessibility is to be constructed with an angle of elevation of 15° and a final height of 5 feet. How long is the ramp?

9. Bob is looking at a helicopter that is flying 1000 feet above the ground. Bob is 1500 feet from the helicopter. What angle of elevation is Bob looking at the helicopter?

10. From the top of a tower, the angle of depression to a flower on the ground is 74°. The top of the tower is 95 feet above ground. How far is the flower from the foot of the tower? Approximate to the nearest tenth of a foot.

Solve each right triangle. If necessary, round angle measures to the nearest tenth of a degree; round side lengths to the nearest hundredth.

11.

12.