Name _____ Date _____ Period _____

Solve. Draw a diagram and show all your work. Round all answers to the <u>nearest tenth</u> if necessary.

1. From a boat on the lake, the angle of elevation to the top of a cliff is 12°. If the base of the cliff is 1,366 feet from the boat, how high is the cliff?

2. When sitting atop a tree and looking down at his pal Joey, the angle of depression of Mack's line of sight is 38°. If Joey is known to be standing 39 feet from the base of the tree, how tall is the tree?

3. On a sunny day, a building and its shadow form the sides of a right triangle. If the hypotenuse is 34 m long and the shadow is 24 m, how tall is the building?

4. A building has a ramp to its front door to accommodate persons with disabilities. If the distance from the building to the end of the ramp is 18 feet and the height of the ramp from the ground to the front doors is 7 feet, how long is the ramp?

5. Lookout station B is located 11 miles dues east of station A. The bearing of a fire from A is S 11° E and the bearing from B is S 26° W. Determine the distance from the fire to station B. Round to the nearest tenth.
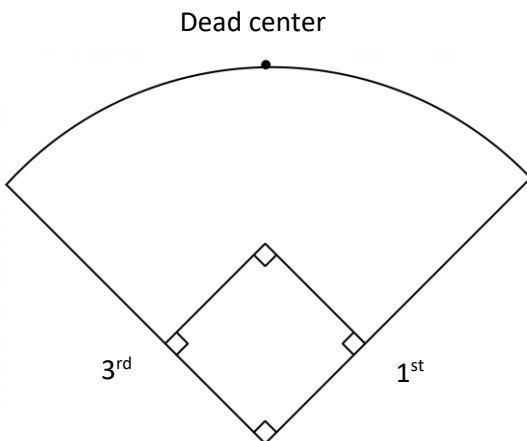
6. A wire that is attached to the top of a tower and anchored in the ground to help stabilize the tower (This is called a guy wire.) makes a 65° angle with level ground. At a point 39 feet farther from the tower but on the same side as the base of the wire, the angle of elevation to the top of the tower is 36°. Find the length of the wire. Round to the nearest tenth.

7. Bob is driving along a straight and level road towards a mountain. At some point on his trip he measures the angle of elevation to the top of the mountain and finds it to be 25°. He then drives 1 mile (1mile=5,280 feet) more and measures the angle of elevation to be 31°. Find the height of the mountain in feet.

8. A person is watching a car from the top of a building. The car is traveling on a straight road directly toward the building. When first noticed the angle of depression to the car is 22°. When the car stops, the angle of depression is 48°. The building is 260 feet tall. How far did the car travel from where it was first noticed until it stopped?

9. A boat leaves the dock and sails in a direction of 70°. Once the boat reaches its destination on the opposite shore, it sails in a direction of 272° and docks 150 km north of its original starting position. What is the total distance the boat has traveled?

10. Target Field is the name of the stadium for the Major League Baseball team the Minnesota Twins. The point on the outfield wall that is the longest distance from home plate is dead center. At Target Field this distance is 403 feet. Given that the infield forms a square with 90 feet on each side, how far is it from third base to dead center?

Dead center

3rd   1st

11. A tower that is leaning is being supported by a guy wire that is 536 feet long. The wire makes an angle of 37° with respect to the ground. The distance from the point where the wire is attached to the ground to the bottom of the tower is 179 feet. Find the height of the tower.

12. Two factories blow their whistles at exactly the same time. A man hears the two blasts exactly 2.3 seconds and 6.7 seconds after they are blown. If the angle between his two lines of sight to the two factories is 46.4°, how far apart are the factories? (Use the fact that sound travels at 344 m/sec.)

13. Two boats leave a dock together, each traveling in a straight line. One boat travels at 31 mph and the other at 12 mph. If the angle between their courses measures 29.4°, how far apart are they after 2.5 hours?