

PRACTICE (5.0)---Solving Problems with Trigonometry

1) The angle of elevation of the top of a cathedral from a point 300 ft away from the base is 60° . Find the height of the cathedral.

2) From a point 100 ft from its base, the angle of elevation to the top of the Arch of Septimus Severus, in Rome, Italy, is $34^\circ 13' 12''$. How tall is this monument?

3) The angle of depression from the top of a lighthouse 120 ft above the surface of the water to a buoy is 10° . How far is the buoy from the lighthouse?

4) A guy wire connects the top of an antenna to a point on level ground 5 ft from the base of the antenna. The angle of elevation formed by this wire is 80° . What are the length of the wire and the height of the antenna?

5) A boat, is located at point P , and L is the nearest point on the shore. Point Q is located 4.25 mi down the shoreline from L & the line segments formed by PL & LQ are perpendicular. Determine the distance that the boat is from the shore if $\angle PQL = 35^\circ$.

6) The angle of elevation from an observer to the bottom edge of an observation deck 200 ft from the observer is 30° . The angle of elevation from the observer to the top of the observation deck is 40° . What is the height of the observation deck?

7) From the top of a 100-ft building a man observes a car moving toward him. If the angle of depression of the car changes from 15° to 33° during the period of observation, how far does the car travel?

8) A Coast Guard cutter travels at 30 knots from its home port of Corpus Christi on a course with bearing 95° for 2 hours. Then, it changes to a course of 185° for 2 hours. Find the distance and the bearing from the Corpus Christi port to the boat.

9) A shoreline runs north-south, and a boat is due east of the shoreline. The bearings of the boat from two points on the shore are 110° & 100° . Assume the two points are 550 ft apart. How far is the boat from the shore?

10) Milwaukee, Wisconsin, is directly west of Grand Haven, Michigan, on opposite sides of Lake Michigan. On a foggy night, a law enforcement boat leaves from Milwaukee on a course with bearing of 105° , at the same time small smuggling craft steers a course of 195° from Grand Haven. The law enforcement boat averages 23 knots and collides with the smuggling craft. What was the smuggling boat's average speed?