APPLICATIONS OF RIGHT TRIANGLE TRIGONOMETRY – WORKSHEET #2

For each of the following problems:

- Draw a right triangle depicting the problem.
- Label the given information.
- Identify the asked for part(s) of the triangle.
- Set up an equation to solve for those parts.
- Round all angle measurements to the nearest minute.
- Round all sides to the nearest tenth.

1. A building casts a shadow 20 meters long. If the angle from the tip of the shadow to a point on top of the building is 69°, how tall is the building?

2. Two trees are on opposite sides of a river. A base line of 100 feet is measured from T_1 to T_2, and from that position the angle measured from T_1 to T_2 is 29.7°. If the base line is perpendicular to the line segment between T_1 and T_2, find the distance between the two trees.

3. A 50-foot tower is located on the edge of a river. The angle of elevation between the opposite bank and the top of the tower is 37°. How wide is the river?

4. The top of a 20-foot ladder is leaning against the edge of the roof of a house. If the angle between the ladder and the ground is 51°, (a) what is the height of the house, (b) how far is the base of the ladder from the house?

5. An airplane at an altitude of 25,000 ft approaches a radar station located on a 2000-foot hill. At one instant in time, the angle between the radar dish pointed at the plane and the horizontal is 57°. What is the straight-line distance in miles between the airplane and the radar station at that particular instant?

6. A 5-mile straight segment of a road climbs a 4000-foot hill. Determine the angle that the road makes with the horizontal.

7. Observers in two towns A and B on either side of a 12,000-foot mountain measure the angles of elevation between the ground and the top of the mountain. Assuming that the towns lie in the same vertical plane, find the horizontal distance between them.

8. A man standing 50 feet from a 20-foot tall house looks up at a TV antenna located on the edge of the roof. If the angle between his line of sight to the edge of the roof and his line of sight to the top of the antenna is 12°, how tall is the antenna?

9. The gnomon (pin) of a sundial is 4 inches in height. What is the angle of elevation of the sun when it casts a 6-inch shadow?

10. Weather radar is capable of measuring both the angle of elevation to the top of a thunderstorm and its range (the horizontal distance to the storm). If the range of a storm is 90 km and the angle of elevation to the top of the storm is 4°, can a passenger plane that is able to climb to 10 km fly over the storm?