

Angles of Elevation and Depression

Solve each problem. Round measures of segments to the nearest hundredth and measures of angles to the nearest degree.

1. A 20-foot ladder leans against a wall so that the base of the ladder is 8 feet from the base of the building. What angle does the ladder make with the ground?
2. A 50-meter vertical tower is braced with a cable secured at the top of the tower and tied 30 meters from the base. What angles does the cable form with the vertical tower?
3. At a point on the ground 50 feet from the foot of a tree, the angle of elevation to the top of the tree is 53° . Find the height of the tree.
4. From the top of a lighthouse 210 feet high, the angle of depression of a boat is 27° . Find the distance from the boat to the foot of the lighthouse. The lighthouse was built at sea level.
5. Richard is flying a kite. The kite string makes an angle of 57° with the ground. If Richard is standing 100 feet from the point on the ground directly below the kite, find the length of the kite string.

Using the Law of Sines

Solve each $\triangle ABC$. Round measures to the nearest tenth.

1. $a = 12$, $m\angle B = 70$, $m\angle C = 15$
2. $a = 12$, $b = 5$, $m\angle A = 110$
3. $a = 8$, $m\angle A = 60$, $m\angle C = 40$

4. $a = 5, c = 4, m\angle A = 65$

5. $b = 6, m\angle A = 44, m\angle B = 68$

8. A ship is sighted from two radar stations 43 km apart. The angle between the line segment joining the two stations and the radar beam of the first station is 37° . The angle between the line segment joining the two stations and the beam from the second station is 113° . How far is the ship from the second station?

Using the Law of Cosines

Solve each triangle $\triangle ABC$ described below. Round measures to the nearest tenth.

1. $a = 16, b = 20, m\angle B = 40$

2. $a = 10, b = 15, c = 12$

3. $a = 42, c = 60, m\angle B = 58$

4. $m\angle A = 60, m\angle B = 72, c = 9$

7. $a = 16, m\angle A = 23, m\angle B = 87$

8. $c = 15.6, a = 12.9, b = 18.4$