

WS4—Right Triangle Applications

1. A surveyor is 100 meters from a monument. The angle of elevation to the top of the monument is  $41^\circ$ . The surveyor's instrument is 1.5 meters above the ground. Find the height of the monument to the nearest hundredth.
2. Ellen Cortez, standing on a 1000 foot cliff, spots a deer on a 700 foot cliff on the other side of the valley. The valley is 500 feet wide. Find the angle of depression to the deer to the nearest hundredth.
3. Greg Robinson is standing on a dock looking at a ship 50 feet away. The angle of elevation to a sailor on the ship is  $24^\circ$ . The angle of depression to a point where the water comes up on the ship is  $32^\circ$ . How far is the sailor from the water? Round your answer to the nearest hundredth.
4. When the angle of elevation of the sun is  $52^\circ$ , a tree casts a shadow of 25 feet. Find the height of the tree to the nearest foot.
5. Anita Lightfoot is in a plane that is at an elevation of 500 feet. She spots a person sunbathing on the roof of a 225 foot building. The distance from the plane to the person is 350 feet. Find the angle of depression to the sunbather. Round your answer to the nearest degree.
6. A kite is flying at the end of a taut string that is 175 feet long. The string is attached to the ground. The angle of elevation of the kite is  $68^\circ$ . How high is the kite in the air? Round your answer to the nearest hundredth.
7. The distance from a boat to a bridge is 200 meters. A person aboard measures the angle of elevation to the bridge is  $12^\circ$ . How far above the water is the bridge? Round your answer to the nearest hundredth.
8. Sam Mitchell is in a hot-air balloon approaching Twin Necks Canyon. He measures the angle of depression to the near rim of the canyon is  $23^\circ$  and to the far rim as  $14^\circ$ . If his balloon is 400 meters from the ground, find the distance across the canyon to the nearest meter.
9. In the mountains, a car rises 4 feet for every 110 feet it moves along the road. Find the angle of elevation of the road to the nearest tenth of a degree.
10. A person standing in a 750 foot tower spots a car parked 95 feet away from the base of the tower. Find, to the nearest degree, the angle of depression to the car.
11. A ladder is leaning against the side of a house from a  $65^\circ$  angle with the ground. The base of the ladder is 8 feet from the building. Find the length of the ladder to the nearest foot.
12. A chairlift at Natural Bridge travels 400 feet from the top of a hill to the base of the hill. If the angle of depression from the top of the hill is  $30^\circ$ , find the height of the hill to the nearest foot.