

# Angles of Elevation and Depression

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## 1. Mountain Hike:

Jake is hiking up a mountain. When he's 100 meters from the base, he looks up to the peak and measures the angle of elevation to be  $30^\circ$ . How high is the peak above Jake's eye level?

## 2. Skyscraper Observation:

From a point on the ground, Lara observes the top of a skyscraper at an angle of elevation of  $45^\circ$ . If she is 200 meters from the base of the skyscraper, how tall is the skyscraper?

## 3. Lighthouse View:

A ship is sailing in the sea and is 5 km away from a lighthouse. The captain sees the top of the lighthouse at an angle of elevation of  $3^\circ$ . If the captain's eye level is 2 meters above the sea level, how tall is the lighthouse?

4. Bird Watching:

Samuel is watching a bird on a tree. The angle of elevation from his eyes to the bird is  $20^\circ$ . If Samuel is standing 30 meters from the tree, how high is the bird from his eye level?

5. Airplane Descent:

An airplane is preparing to land. The pilot notices a building in the distance and measures an angle of depression of  $10^\circ$  to the top of the building. If the airplane is flying at a height of 3000 meters, how far is the airplane from the building?

6. Pool Dive:

Sarah stands at the edge of a diving platform and looks down at the pool below. The angle of depression from her toes to the other end of the pool is  $25^\circ$ . If the pool is 50 meters long, how high is the diving platform?

7. Observation Wheel:

Mark is on an observation wheel and at the highest point. He looks down at his friend and sees him at an angle of depression of  $15^\circ$ . If the observation wheel has a radius of 40 meters, how far is his friend from the base of the wheel?

8. Hill Descent:

A cyclist is about to descend a hill. Before she starts, she measures the angle of depression to the foot of the hill to be  $12^\circ$ . If she is 500 meters from the base of the hill, how high is she currently above the base?

9. Castle Tower:

From a distance of 150 meters, a tourist looks up at a castle's tower and notices the flag on top at an angle of elevation of  $18^\circ$ . How high is the flag from the tourist's eye level?

10. Balloon Adventure:

Alice is in a hot air balloon and measures the angle of depression to a landmark on the ground as  $26^\circ$ . If the hot air balloon is 1000 meters above the ground, how far is Alice from the landmark horizontally?

11. Mountain Peak:

Sophia stands 500 meters away from a mountain peak and sees the top at an angle of elevation of  $40^\circ$ . How high is the peak above Sophia's eye level?

12. Building Shadow:

A tall building casts a shadow 300 meters long. The angle of elevation of the sun is  $50^\circ$ . How tall is the building?

13. Bridge Observation:

John stands under a bridge and looks up to see a bird sitting at an angle of elevation of  $60^\circ$ . If he is 50 meters from the bird horizontally, how high is the bird above him?

14. Kite Flying:

Emily flies a kite and lets out 100 meters of string at an angle of elevation of  $70^\circ$ . How high is the kite above the ground?

15. Canyon Depth:

Mark stands at the edge of a canyon and looks down to see a river at an angle of depression of  $28^\circ$ . If he is 400 meters from the river horizontally, how deep is the canyon at that point?

16. Stadium Lights:

A football player looks up at the stadium lights at an angle of elevation of  $75^\circ$ . If he is 20 meters away from the base of the light pole, how high are the lights?

17. Hilltop Viewing:

From a hilltop, Anna observes a car on the ground below at an angle of depression of  $12^\circ$ . If the hill is 500 meters high, how far is the car from the base of the hill?

18. Rooftop Ladder:

A ladder leans against a building, touching the roof at an angle of elevation of  $65^\circ$ . If the ladder is 8 meters long, how high does it reach on the building?

19. From a boat at sea, a sailor sees a lighthouse on top of a cliff. The angle of elevation to the lighthouse's top is  $15^\circ$ . If the sailor is 800 meters from the base of the cliff, how tall is the cliff?

20. Hot Air Balloon:

Jack is in a hot air balloon and measures an angle of depression of  $10^\circ$  to a farmhouse. If the balloon is 500 meters above the ground, how far is the balloon from the farmhouse horizontally?

## Answers

1. 57.74 meters
2. 200 meters
3. 261.8 meters
4. 10.92 meters
5. 16952.1 meters
6. 23.31 meters
7. 150.88 meters
8. 106.28 meters
9. 48.74 meters
10. 2190.2 meters
11. 419.55 meters
12. 357.54 meters
13. 86.6 meters
14. 93.97 meters
15. 212.68 meters
16. 74.64 meters
17. 2352.89 meters
18. 7.25 meters
19. 214.32 meters
20. 2834.49 meters