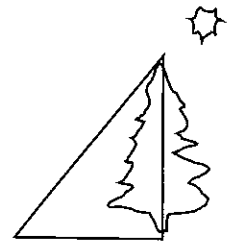


# Angles of Elevation & Depression

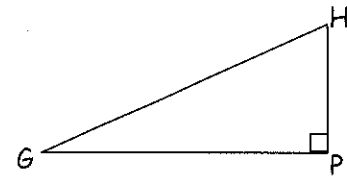
Name \_\_\_\_\_

## Worksheet

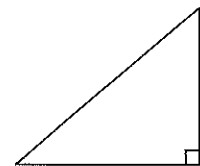
1. A tree casts a shadow 21m long. The angle of elevation of the sun is  $51^\circ$ . What is the height of the tree?



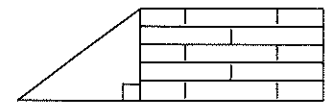
2. A helicopter (H) is hovering over a landing pad (P) 100m from where you are standing (G). The helicopter's angle of elevation with the ground is  $12^\circ$ . What is the altitude of the helicopter?



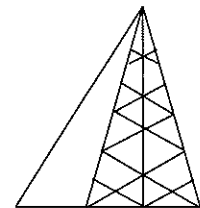
3. You are flying a kite and have let out 80m of string. The kite's angle of elevation with the ground is  $40^\circ$ . If the string is stretched straight, how high is the kite above the ground?



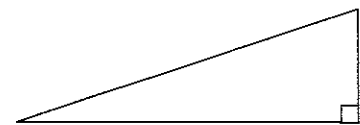
4. A 15 m pole is leaning against a wall. The foot of the pole is 10 m from the wall. Find the angle the pole makes with the ground.



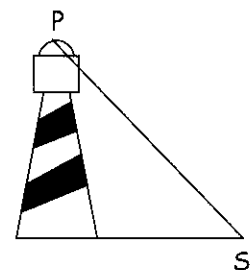
5. A guy wire reaches from the top of a 120 m television transmitter tower to the ground. The wire makes a  $63^\circ$  angle with the ground. Find the length of the guy wire.



6. An airplane climbs at an angle of  $18^\circ$  with the ground. Find the ground distance the plane travels as it moves 2500 m through the air. Give your answer to the nearest 100m.



7. A lighthouse operator at point P, 25m above sea level sights a sailboat at a point S. The angle of depression of the sighting is  $10^\circ$ . How far is the boat from the base of the lighthouse? Give your answer to the nearest 10m.



**Draw pictures for each problem situation before you solve the problem.**

8. A wooden beam 24 feet long leans against a wall and makes an angle of  $71^\circ$  with the ground. Find to the nearest foot how high up the wall the beam reaches.
9. From the top of a lighthouse 160 feet high, the angle of depression of a boat out at sea is  $24^\circ$ . Find to the nearest foot the distance from the boat to the foot of the lighthouse, if the foot of the lighthouse is at sea level.
10. The 600 block of Powell Street in San Francisco rises 10 feet for every 66 feet along the horizontal. Find the grade of the road. (Grade is the ratio rise/run)
11. A 30 foot steel girder is leaning against a wall. The foot of the girder is 20 feet from the wall. Find to the nearest degree the angle the girder makes with ground.
12. A guy wire attached to the top of a pole reaches a stake in the ground 20 feet from the foot of the pole and makes an angle of  $58^\circ$  with the ground. Find to the nearest foot the length of the guy wire.
13. The grade of Maple Street is 12%. Find the angle the street makes with the horizontal.
14. A surveyor is 100 meters from a bridge. The angle of elevation to the top of the bridge is  $35^\circ$ . Find the height of the bridge.
15. To secure a 500-meter radio tower against high winds, guy wires are attached to the top of the tower. Each wire forms a  $15^\circ$  angle with the top of the tower. Find the length of the wire from the tower to its anchor in the ground.

Name \_\_\_\_\_

Trig Word Problems Worksheet

1. A boy flying a kite lets out 300 feet of string which makes an angle of  $38^\circ$  with the ground. Assuming that the string is straight, how high above the ground is the kite?

2. A ladder leaning against the wall makes an angle of  $74^\circ$  with the ground. If the foot of the ladder is 6.5 feet from the wall, how high on the wall is the ladder?

3. A straight road to the top of a hill is 2500 feet long and makes an angle of  $12^\circ$  with the horizontal. Find the height of the hill.

4. An airplane climbs at an angle of  $11^\circ$  with the ground. Find the ground distance it has traveled when it has attained an altitude of 400 feet.

**5. A wire attached to the top of a pole reaches a stake in the ground 20 feet from the foot of the pole and makes an angle of  $58^\circ$  with the ground. Find the length of the wire.**

**6. Henry is flying a kite. The kite string makes an angle of  $43^\circ$  with the ground. If Henry is standing 100 feet from a point on the ground directly below the kite, find the length of the kite string.**

**7. A 25 foot ladder leans against a building. The ladder's base is 13.5 feet from the building. Find the angle which the ladder makes with the ground.**

**8. In order to reach the top of a hill which is 250 feet high, one must travel 2000 feet straight up a road which leads to the top. Find the number of degrees contained in the angle which the road makes with the horizontal.**

**9. A ladder leans against a building. The top of the ladder reaches a point on the building which is 18 feet above the ground. The foot of the ladder is 7 feet from the building. Find the measure of the angle which the ladder makes with the level ground.**