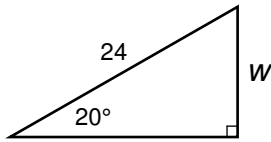


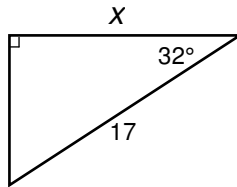
In the following problems, please round lengths to the nearest *hundredth*, and angle measures to the nearest *tenth*.

In problems 1-6, find the value of the missing side or angle measure. All lengths are in centimeters.

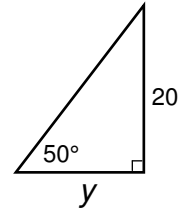
1. _____



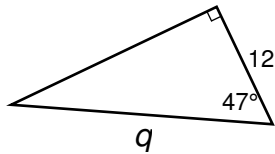
2. _____



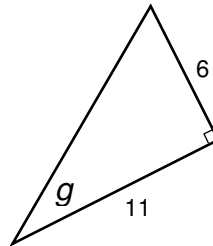
3. _____



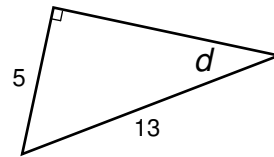
4. _____



5. _____

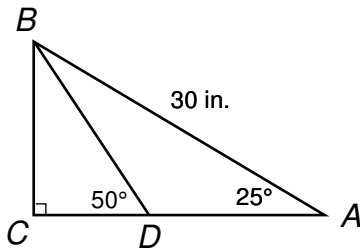


6. _____



In problems 7 and 8, find the indicated measures.

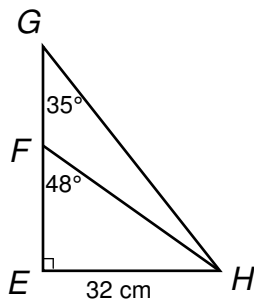
7. Find:



a. $BC =$ _____

b. $BD =$ _____

8. Find:



a. $EF =$ _____

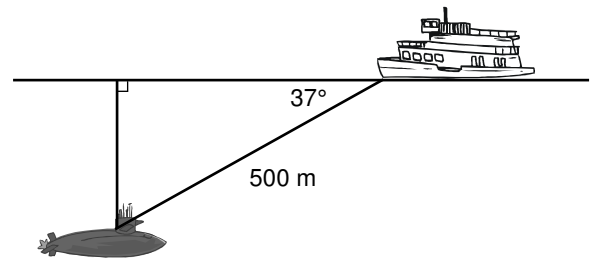
b. $EG =$ _____

c. $FG =$ _____

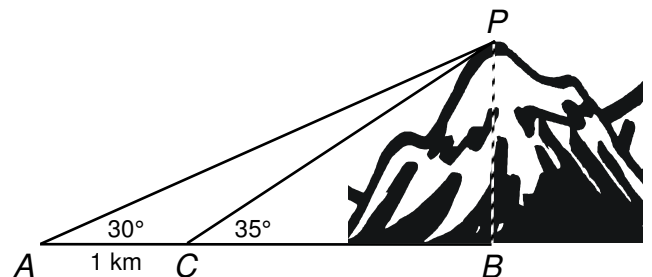
In problems 9-23, solve the problem.

9. A ladder is leaning against the side of a house and forms a 65° angle with the ground. The foot of the ladder is 8 feet from the house. Find the length of the ladder.
10. A lighthouse built at sea level is 150 feet high. From its top, the angle of depression of a buoy is 25° . Find the distance from the buoy to the foot of the lighthouse.
11. A surveyor is 100 meters from a bridge. The angle of elevation to the top of the bridge is 35° . The surveyor's instrument is 1.45 meters above the ground. Find the height of the bridge.
12. A surveyor is 100 meters from a building. The angle of elevation to the top of the building is 23° . The surveyor's instrument is 1.55 meters above the ground. Find the height of the building.
13. In a parking garage, each level is 20 feet apart. Each ramp to a level is 130 feet long. Find the measure of elevation for each ramp.

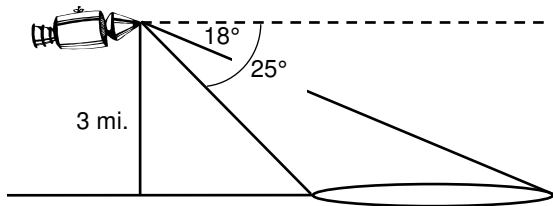
14. A train in the mountains rises 10 feet for every 250 feet it moves along the track. Find the angle of elevation of the track.
15. A plane rose from take-off and flew at an angle of 11° with the ground. When it reached an altitude of 500 feet, what was the horizontal distance the plane had flown?
16. As viewed from a cliff 360 m above sea level, the angle of depression of a ship is 28° . How far is the ship from the shore?
17. A sonar operator on a cruiser detects a submarine at a distance of 500 m and an angle of depression of 37° . How deep is the submarine?



18. A mountain has a base and peak that are inaccessible. At point A , the angle of elevation of the peak is 30° . One kilometer closer to the mountain, at point C , the angle of elevation of the peak is 35° . Find the height PB of the mountain.

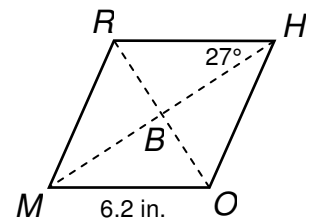


19. Before Apollo 11 descended to the surface of the moon, it made one orbit at a distance of 3 miles above the surface of the moon. At one point in its orbit, the onboard guidance system measured the angles of depression to the near and far sides of a huge crater. The angles measured 25° to the near side of the crater, and 18° to the far side of the crater. Find the distance across the crater.

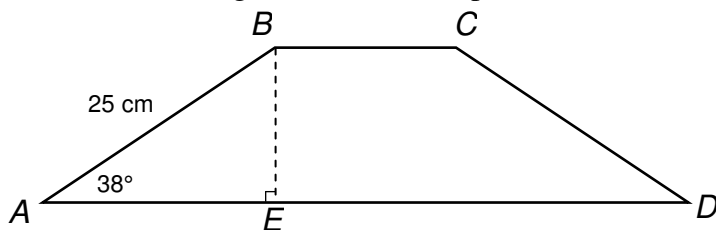


20. An observer on a cliff 1000 yards above sea level sights two ships due east. The angles of depression of the ships are 47° and 32° . Find the distance between the two ships.

21. One diagonal of a rhombus makes an angle of 27° with a side of the rhombus. If each side of the rhombus has a length of 6.2 inches, find the length of each diagonal.



22. Find the height of isosceles trapezoid $ABCD$ as marked.



23. The legs of an isosceles triangle are each 18 cm. The base is 14 cm. Find:

- a) the measure of the base angles, and
- b) the *exact* length of the altitude to the base.

