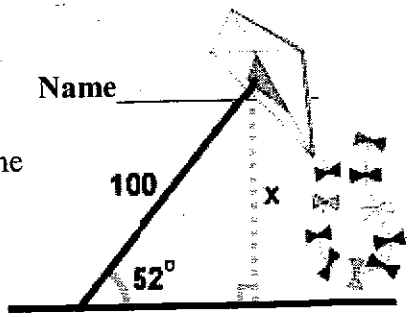
Right Triangle Trig using Angles of Elevation and Depression

Name_____



1. A man flies a kite with a 100 foot string. The angle of elevation of the string is 52°. How high off the ground is the kite?

2. Liola drives 20 km up a hill that is at a grade of 10°. What horizontal distance, to the nearest tenth of a kilometer, has she covered?

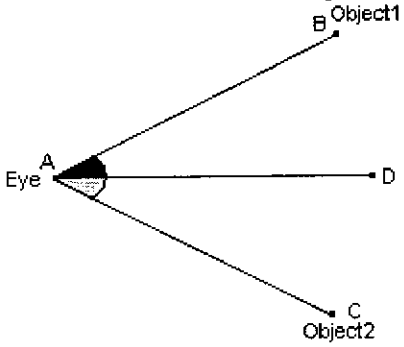
3. A car is traveling up a slight grade with an angle of elevation of 2°. After traveling 1 mile, what is the vertical change in feet?

4. A 30 ft ladder is resting against a building. The base of the ladder is 6 feet from the building. What is the angle of elevation of the ladder from the ground to the top of the ladder?

5. To find the height of a pole, a surveyor moves 80 feet away from the base of the pole and then, with a transit 4 feet tall, measures the angle of elevation to the top of the pole to be 57°. What is the height of the pole? Round answer to the nearest foot.

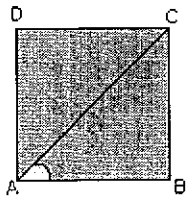
6. A bird is flying at a height of 40 feet and spots a ledge that is 8 ft high on which to perch. If the top of the ledge is at a 22° angle of depression from the bird, how far must the bird fly before it can land?

7. Which of the following is the angle of depression in the figure?



8. A tree 10 meters high casts a 17.3 meter shadow. Find the angle of elevation of the sun.

9. If the side of the square is 3 feet, then find the acute angle of elevation.



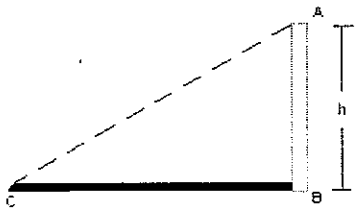
10. Tom and Sam are on the opposite sides of a tower of 160 meters height. They measure the angle of elevation of the top of the tower as 40° and 55° respectively. Find the distance between Tom and Sam.

11. From the top of a spire of height 50 ft, the angles of depression of two cars on a straight road at the same level as that of the base of the spire and on the same side of it are 25° and 40°. Calculate the distance between the two cars.

12. From the top of a tower of height h meters the angle of depression of a red car is φ ° and the angle of depression of a blue car which is on the opposite side of the tower is θ °. If the distance between the foot of the tower and the red car is y meters, then find the height of the tower and the distance between the two cars.
Assume that the points of location of the cars and the foot of the tower are collinear. [Given y = 115, $\theta = 55°$ and $\varphi = 40°$.]

13. The angle of elevation of an unfinished tower from a point 120 m away from its base is 25°. How much higher will the tower need to be raised so that its angle of elevation from the same point will be 40°?

14. Find the angle of elevation of the sun when the length of the shadow of a pole is $\sqrt{3}$times the height of the pole.



15. The upper part of a pole broken over by wind makes an angle 30° with the ground and touches the ground at a distance 26 feet from its base. What was the height of the pole before it broke?