

Geometry

1. Express these trig ratios as fractions (exact values):

a. $\sin 30^\circ$

d. $\sin 45^\circ$

g. $\sin 60^\circ$

b. $\cos 30^\circ$

e. $\cos 45^\circ$

h. $\cos 60^\circ$

c. $\tan 30^\circ$

f. $\tan 45^\circ$

i. $\tan 60^\circ$

EXERCISES

Solve each problem. Express each answer to the nearest whole number.

- A ladder 10 meters long leans against a building and makes a 38° angle with level ground. How high up the building does the ladder reach?
- Two television towers, each 100 meters tall, are 350 meters apart. Find the angle of elevation from the base of one tower to the top of the other.
- A tree 23 meters tall casts a shadow 17 meters long. Find the measure of the angle of elevation to the sun at that time.
- From a boat on a lake, the measure of the angle of elevation to the top of a telephone pole on shore is 42° . If the boat is 120 meters from the pole, what is the distance from the boat to the top of the pole?
- Sightings to the top, A, of a tower 75 meters tall are made from points D and B. These points are collinear with the tower's base and in the same direction from it. The measure of the angle of elevation at D is 21° and the angle of elevation at B has a measure of 27° . What is the distance from D to B?
- From the top of a cliff at the edge of a lake, the angle of depression to a buoy on the lake is 33° . If the buoy is 80 meters from the base of the cliff, how high is the cliff?
- A ship is 750 meters from a lighthouse, which is 50 meters tall. What is the angle of depression from the top of the lighthouse to the ship?
- A basketball hoop is 10 feet above the floor. What is the angle of elevation to the hoop from a point on the floor 15 feet from a point directly below the hoop?
- An airplane pilot finds the measure of the angle of depression of the edge of the runway to be 47° . If the altitude of the plane is 550 feet, what is the distance from a point on the ground directly below the plane to the edge of the runway?
- An airplane is approaching an airport at an altitude of 300 feet. Looking directly down the runway, the pilot sights an angle of depression with a measure of 29° to the near end of the runway and one with a measure of 7° to the far end of the runway. What is the length of the runway?

$$11. \cos(47^\circ) = \sin(x)$$

$$12. \text{ IF } \cos(A) = \frac{7}{9}, \text{ FIND THE EXACT VALUES OF } \sin(A), \tan(A).$$