NAME: _____ KEY

Geometry

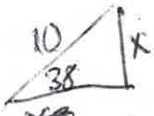
1. Express these trig ratios as fractions (exact values):

a. sin30° $\frac{1}{2}$	d. sin45° $\frac{\sqrt{2}}{2}$	g. sin60° $\frac{\sqrt{3}}{2}$
b. cos30° $\frac{\sqrt{3}}{2}$	e. cos45° $\frac{\sqrt{2}}{2}$	h. cos60° $\frac{1}{2}$
c. tan30° $\frac{\sqrt{3}}{3}$	f. tan45° 1	i. tan60° $\sqrt{3}$

EXERCISES

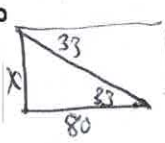
Solve each problem. Express each answer to the nearest whole number.

1. 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?



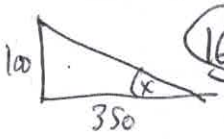
6

2. 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?



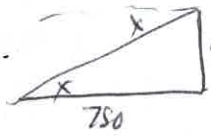
52

3. 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.



16°

4. 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?

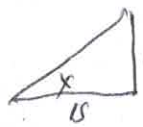


4°

5. 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.

54°

6. 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?

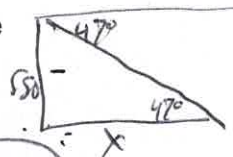


34°

7. 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?

161m

8. 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?



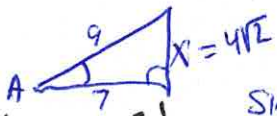
513ft

9. 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?

10. 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. $\cos(47°) = \sin(x)$ $x = 43°$

12. If $\cos(A) = \frac{7}{9}$, find the exact values of $\sin(A)$, $\tan(A)$.



$\sin A = \frac{4\sqrt{2}}{9}$

$\tan A = \frac{4\sqrt{2}}{7}$