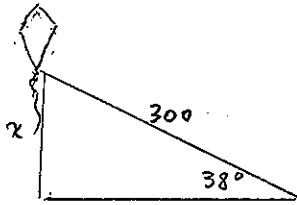## Trig Word Problems Worksheet(2)

1. A boy flying a kite lets out 300 feet of string which makes an angle of 38° with the ground. Assuming that the string is straight, how high above the ground is the kite?
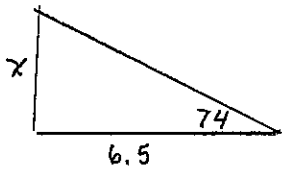
$$\sin 38 = \frac{x}{300}$$

$$x = 300(\sin 38)$$

$$x = 184.69$$

2. A ladder leaning against the wall makes an angle of 74° with the ground. If the foot of the ladder is 6.5 feet from the wall, how high on the wall is the ladder?
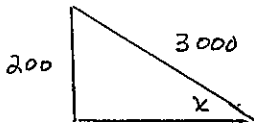
$$\tan 74° = \frac{x}{6.5}$$

$$x = 6.5 (\tan 74°)$$

$$x = 22.66$$

3. A straight road to the top of a hill 200 feet high is 3000 feet long. Find the angle the road makes with the horizontal.
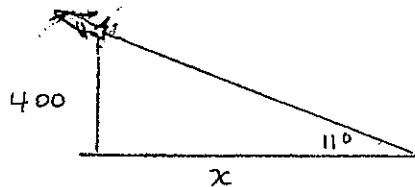
$$\sin x = \frac{200}{3000}$$

$$x = \sin^{-1}\left(\frac{2}{30}\right)$$

$$x = 3.8°$$

4. An airplane climbs at an angle of 11° with the ground. Find the ground distance it has traveled when it has attained an altitude of 400 feet.
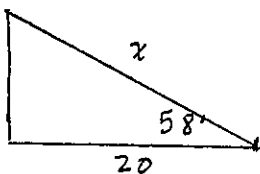
$$\tan 11 = \frac{400}{x}$$

$$x = \frac{400}{\tan 11°}$$

$$x = 2057.82$$

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° with the ground. Find the length of the wire.
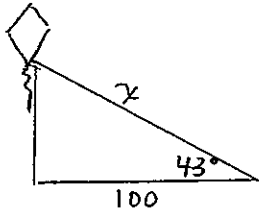
$$\cos 58° = \frac{20}{x}$$

$$x = \frac{20}{\cos 58°}$$

$$x = 37.74$$

6. Henry is flying a kite. The kite string makes an angle of 43° 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.
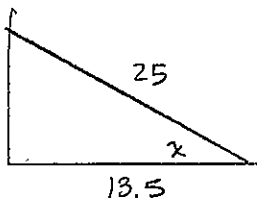
$$Cos\ 43 = \frac{100}{x}$$

$$x = \frac{100}{Cos\ 43°}$$

$$x = 136.73$$

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.
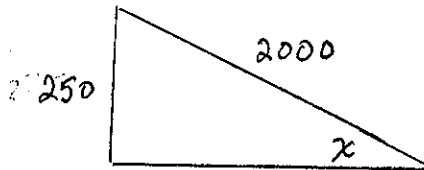
$$Cos\ x = \frac{13.5}{25}$$

$$x = Cos^{-1}\left(\frac{13.5}{25}\right)$$

$$x = 57.3°$$

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.
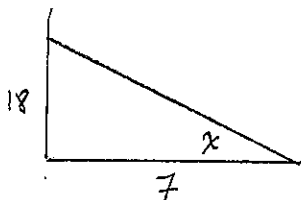
$$Sin\ x = \frac{250}{2000}$$

$$x = Sin^{-1}\left(\frac{250}{2000}\right)$$

$$x = 7.18°$$

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.
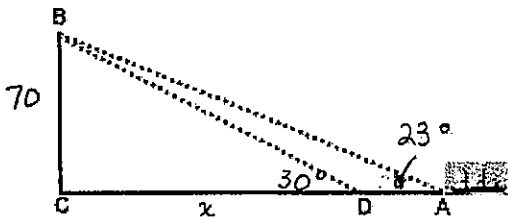
$$tan\ x = \frac{18}{7}$$

$$x = tan^{-1}\left(\frac{18}{7}\right)$$

$$x = 68.7°$$

10. As shown in the diagram, a ship is headed directly toward a coastline formed by a vertical cliff $\overline{BC}$, 70 meters high. At point A, the angle of elevation from the ship to B, the top of the cliff, is 23°. A few minutes later at point D, the angle of elevation increases to 30°.

(a) To the nearest meter, find:
   (1) DC
   (2) AC
   (3) AB
(b) To the nearest meter, what is the distance between the ship's position to the two sightings?

(a) (1) <u>DC (x)</u>

$\tan 30 = \dfrac{70}{x}$

$X = \dfrac{70}{\tan 30}$

$x = 121.24$

(2) <u>Ac (y)</u>

$\tan 23 = \dfrac{70}{y}$

$y = \dfrac{70}{\tan 23}$

$x = 164.90$

(3) <u>AB (z)</u>

$\sin 23 = \dfrac{70}{z}$

$z = \dfrac{70}{\sin 23}$

$z = 179.15$

(b) AC - CD

164.90 - 121.24 = 43.66