8–4 NAME Key DATE

Practice

Student Edition
Pages 420–425

Angles of Elevation and Depression

Solve each problem. Round measures of segments to the nearest hundredth and measures of angles to the nearest degree.

1. A 20-foot ladder leans against a wall so that the base of the ladder is 8 feet from the base of the building. What angle does the ladder make with the ground?

$\cos x = \frac{8}{20}$ 66°

2. A 50-meter vertical tower is braced with a cable secured at the top of the tower and tied 30 meters from the base. What angles does the cable form with the vertical tower?

$\tan x = \frac{30}{50}$ 31°

3. At a point on the ground 50 feet from the foot of a tree, the angle of elevation to the top of the tree is 53°. Find the height of the tree.

$\tan 53 = \frac{x}{50}$ 66.35 ft

4. From the top of a lighthouse 210 feet high, the angle of depression to a boat is 27°. Find the distance from the boat to the food of the lighthouse. The lighthouse was built at sea level.

$\tan 27 = \frac{210}{x}$ 412.15 ft

5. Richard is flying a kite. The kite string makes an angle of 57° with the ground. If Richard is standing 100 feet from the point on the ground directly below the kite, find the length of the kite string.

$\cos 57 = \frac{100}{x}$ 183.61 ft

6. An airplane rises vertically 1000 feet over a horizontal distance of 1 mile. What is the angle of elevation of the airplane's path? (Hint: 1 mile = 5280 feet)

$\tan x = \frac{1000}{5280}$ 11°

8–4 NAME DATE

Name KEY #____
Date_____ Class_____

Solve each problem given below. Round measures of lengths to the nearest whole number and angles to the nearest whole degree.

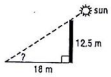
1.) The angle of elevation from point A to the top of a hill is 49°. If point A is 400 feet from the base of the hill, how high is the hill?

460 ft

$$\frac{\tan 49}{1} = \frac{x}{400}$$

2.) Find the angle of elevation of the sun when a 12.5-meter-tall telephone pole casts a 18-meter-long shadow.

35°

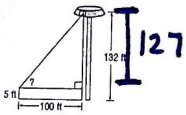


3.) A ladder leaning against a building makes an agle of 78° with the ground. The foot of the ladder is 5 feet from the building. How long is the ladder?

24 ft

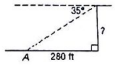
4.) A person whose eyes are 5 feet above the ground is stanind on the runway of an airport 100 feet from the control tower. That person observes an air traffic controller at the window of the 132-foot tower. What is the angle of elevation?

52°



5.) The angle of depression from the top of a sheer cliff to point A on the ground is 35°. If point A is 280 feet from the base of the cliff, how tall is the cliff?

196 ft

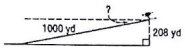


6.) The angle of depression from a balloon on a 75-foot string to a person on the ground is 36°. How high is the balloon?

44 ft

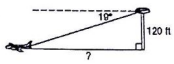
7.) A ski run is 1000 yards long with a vertical drop of 208 yards. Find the angle of depression from the top of the ski run to the bottom.

12°



8.) From the top of a 120-foot-high tower, an air traffic controller observes an airplane on the runway at an angle of depression of 19°. How far from the base of the tower is the airplane?

349 ft

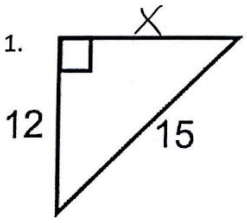


Right Triangle Trig Review

Name: Key

Solve for missing side using Pythagorean Theorem.

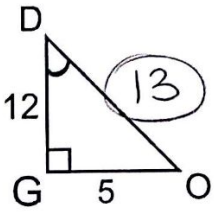
1.



$x = 9$

Solve for missing side. Find values of the trig functions.

2.

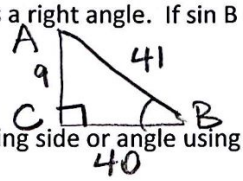


sin D = $5/13$

cos D = $12/13$

tan D = $5/12$

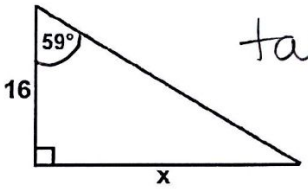
3. In ΔABC, $\angle C$ is a right angle. If sin B = 9/41, find cos B. (Hint: Draw the triangle first)



$\cos B = \frac{40}{41}$

Solve for the missing side or angle using SOH CAH TOA.

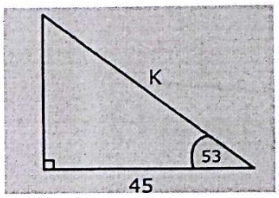
4.



$\tan 59 = \frac{x}{16}$

$x = 26.6$

5.

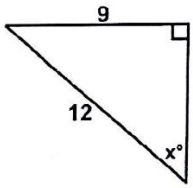


$\cos 53 = \frac{45}{K}$

$K \cos 53 = 45$

$K = 74.8$

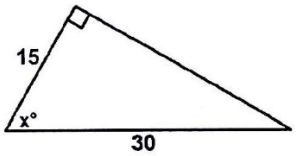
6.



$\sin x = \frac{9}{12}$

$x = 48.6°$

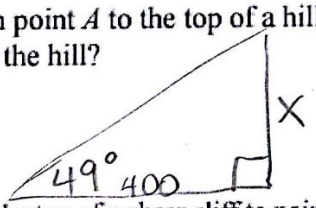
7.



$\cos x = \frac{15}{30}$ $x = 60°$

Solve the angle of elevation/depression problems.

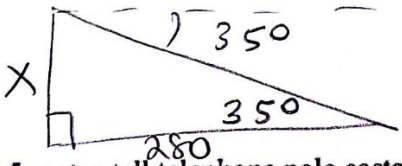
8. The angle of elevation from point A to the top of a hill is 49°. If point A is 400 feet from the base of the hill, how high is the hill?



$\tan 49 = \frac{x}{400}$ $x = 460.1$ ft

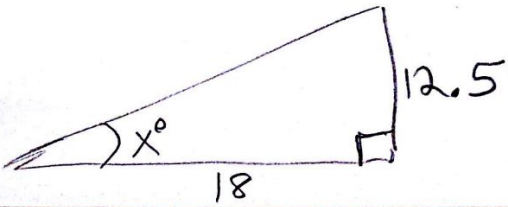
9. The angle of depression from the top of a sheer cliff to point A on the ground is 35°. If point A is 280 feet from the base of the cliff, how tall is the cliff?

$\tan 35 = \frac{x}{280}$



$x = 196.1$ ft

10. Find the angle of elevation of the sun when a 12.5-meter-tall telephone pole casts a 18-meter-long shadow.



$\tan x = \frac{12.5}{18}$

$x = 34.8°$