

12.2 Problem Solving with Right Triangles – Day 1 Homework

Name: Key

Geometry 3313

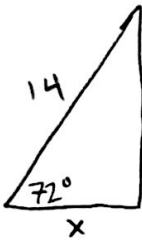
Date _____ Period _____

Learning Target: I can solve application problems using trigonometry ratios.

For each problem, sketch a model of the described situation, write an equation, solve it, and answer the question. Round your answers to the nearest tenths place.

1. A 14 foot ladder is leaning against a house. The angle formed by the ladder and the ground is 72° .

- a) Determine the distance from the base of the ladder to the house.

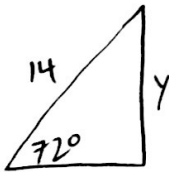


$$\cos 72^\circ = \frac{x}{14}$$

$$14 \cos 72 = x$$

$$x = 4.3 \text{ ft}$$

- b) Determine the height that the ladder reaches up the side of the house.

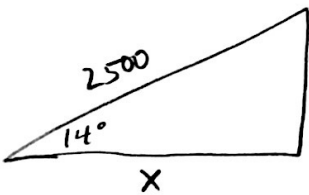


$$\sin 72^\circ = \frac{y}{14}$$

$$14 \sin 72^\circ = y$$

$$y = 13.3 \text{ ft}$$

2. You travel along a flat road that is 2,500 feet long to the top of a hill. The road makes 14° angle with respect to the horizontal. Find the horizontal distance you traveled.

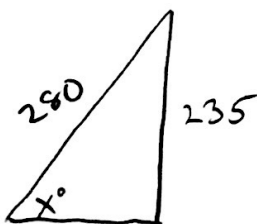


$$\cos 14^\circ = \frac{x}{2500}$$

$$2500 \cos 14^\circ = x$$

$$x = 2425.8 \text{ ft}$$

3. A 280 foot long wire is extended from the top of a tower to a point on the ground. If the height of the tower is 235 feet, what is the measurement of the angle formed by the wire and the ground?

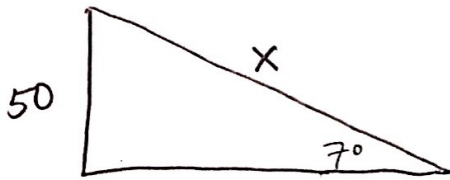


$$\sin x = \frac{235}{280}$$

$$x = \sin^{-1}\left(\frac{235}{280}\right)$$

$$x = 57.1^\circ$$

4. An airplane takes off at an angle of 7° with respect to the ground. After the airplane has traveled an altitude of 50 miles, how far along its flight path has it traveled?



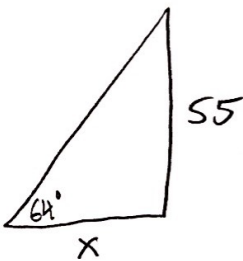
$$\sin 7^\circ = \frac{50}{X}$$

$$X \sin 7 = 50$$

$$X = \frac{50}{\sin 7} = \boxed{410.3 \text{ mi}}$$

outer space?

5. A wire is stretched from a point on the ground to the top of a 55 foot telephone pole. The angle formed by the wire with respect to the ground is 64° . What is the distance from the point on the ground to the base of the telephone pole?

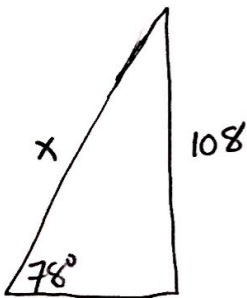


$$\tan 64^\circ = \frac{55}{X}$$

$$X \tan 64 = 55$$

$$X = \frac{55}{\tan 64} = \boxed{26.8 \text{ ft}}$$

6. A hot air balloon is tethered to the ground by a rope. Due to the wind, the angle formed by the rope and the ground is 78° . If the altitude reached by the balloon is 108 feet, what is the length of the rope?

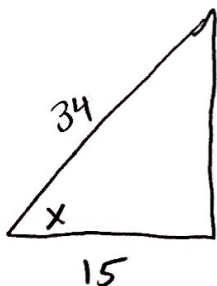


$$\sin 78^\circ = \frac{108}{X}$$

$$X \sin 78 = 108$$

$$X = \frac{108}{\sin 78} = \boxed{110.4 \text{ ft}}$$

7. A 34 foot ladder has its base 15 feet from the edge of the building against which it is leaning. In order to be stable, the angle that the ladder makes with the ground must be less than 65.5° . Is this ladder stable?



$$\cos X = \frac{15}{34}$$

$$X = \cos^{-1}\left(\frac{15}{34}\right)$$

$$\boxed{X = 63.8^\circ}$$

$$63.8 < 65.5$$

The Ladder **IS STABLE**