

# Worksheet 8.4 Trig Word Problems (solutions)

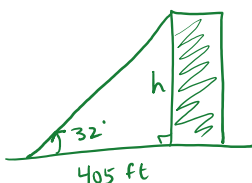
Tuesday, March 13, 2018 4:21 AM

**Worksheet 8.4 Trig Word Problems**  
 Geometry Regular

Name \_\_\_\_\_  
 Date \_\_\_\_\_ Mods \_\_\_\_\_

**Draw diagrams for each word problem and show the trig function used to solve the problem.**

1. A monument stands on level ground. The angle of elevation to the top of the monument taken at a point 405 feet away is  $32^\circ$ . Find the height of the monument.

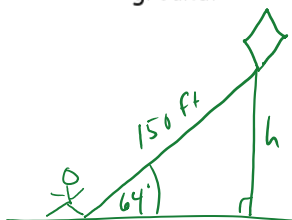


$$\tan 32^\circ = \frac{h}{405}$$

$$h = 405 \tan 32^\circ$$

$$h \approx 253.07 \text{ ft}$$

2. A boy flying a kite lets out 150 feet of string that makes an angle of  $64^\circ$  with the ground. If the string forms a straight line, how high is the kite above the ground?

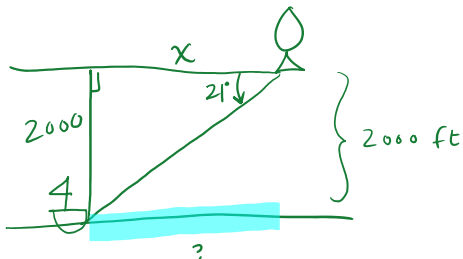


$$\sin 64^\circ = \frac{h}{150}$$

$$h = 150 \sin 64^\circ$$

$$h \approx 134.82 \text{ ft}$$

3. A person in a balloon which is 2,000 feet above the airport finds that the angle of depression to a ship out at sea is  $21^\circ$ . Find the horizontal distance between the balloon and the ship. (or the distance from the airport to the ship)



$$\frac{\tan 21^\circ}{1} = \frac{2000}{x}$$

$$x \tan 21^\circ = 2000$$

$$x = \frac{2000}{\tan 21^\circ} \approx 5,210.18 \text{ ft}$$

4. An airplane climbs at an angle of  $11^\circ$  with the ground. Find the distance it has traveled when it has attained an altitude of 400 feet.



$$\sin 11^\circ = \frac{400}{x}$$

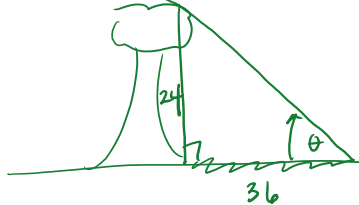
$$x \sin 11^\circ = 400$$

$$x = \frac{400}{\sin 11^\circ}$$

$$x \approx 2,096.34 \text{ ft}$$



5. Find the angle of elevation of the sun when a 24 foot tree casts a shadow of 36 feet.

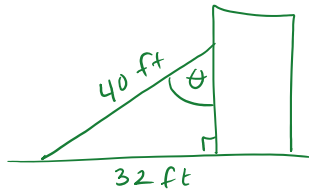


$$\tan \theta = \frac{24}{36}$$

$$\theta = \tan^{-1} \frac{2}{3}$$

$$\theta \approx 33.69^\circ$$

6. A 40-foot ladder is leaning against a building. The foot of the ladder is 32 feet from the building. Find the angle that the ladder makes with the building.

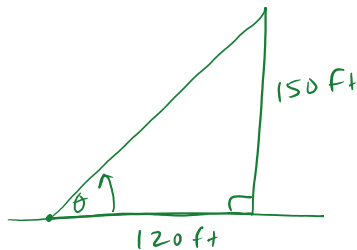


$$\sin \theta = \frac{32}{40}$$

$$\theta = \sin^{-1} \frac{4}{5}$$

$$\theta = 53.13^\circ$$

7. A television tower is 150 feet high and an observer is 120 feet from the base of the tower. Find the angle of elevation to the top of the tower from the place where the observer is standing.

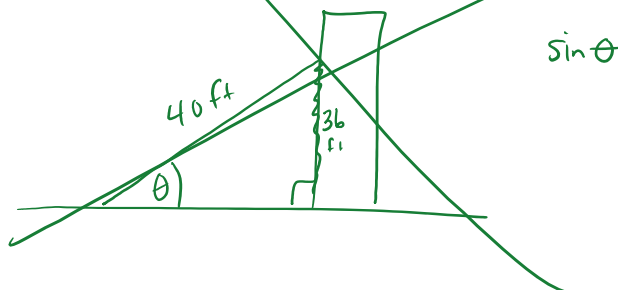


$$\tan \theta = \frac{150}{120}$$

$$\theta = \tan^{-1} \frac{5}{4}$$

$$\theta \approx 51.34^\circ$$

8. A 40-foot ladder which is leaning against a wall reaches the wall at a point 36 feet from the ground. Find the angle that the ladder makes with the ground.



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