

March 8, 2016

Today we will apply what we have learned about trigonometric ratios

EQ: How do you determine where the angle of depression or elevation is located in a right triangle?

MMC9-12.G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

Homework Answers

1. 1

2. .31

3. .67

4. .96

5. .87

6. .03

7. 58.91

8. 45.31

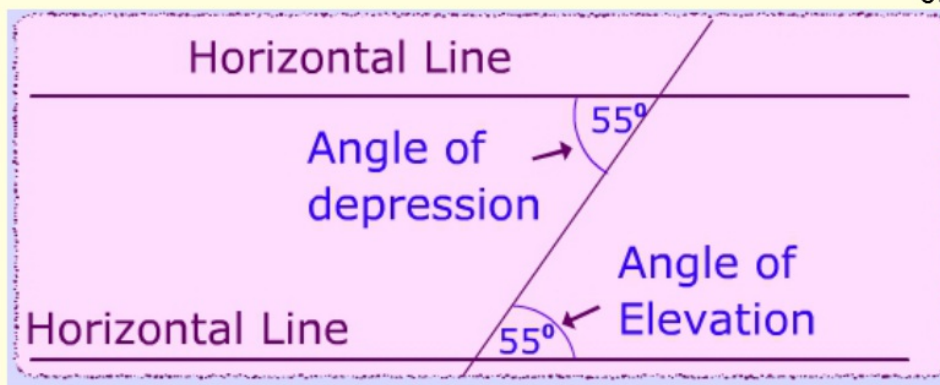
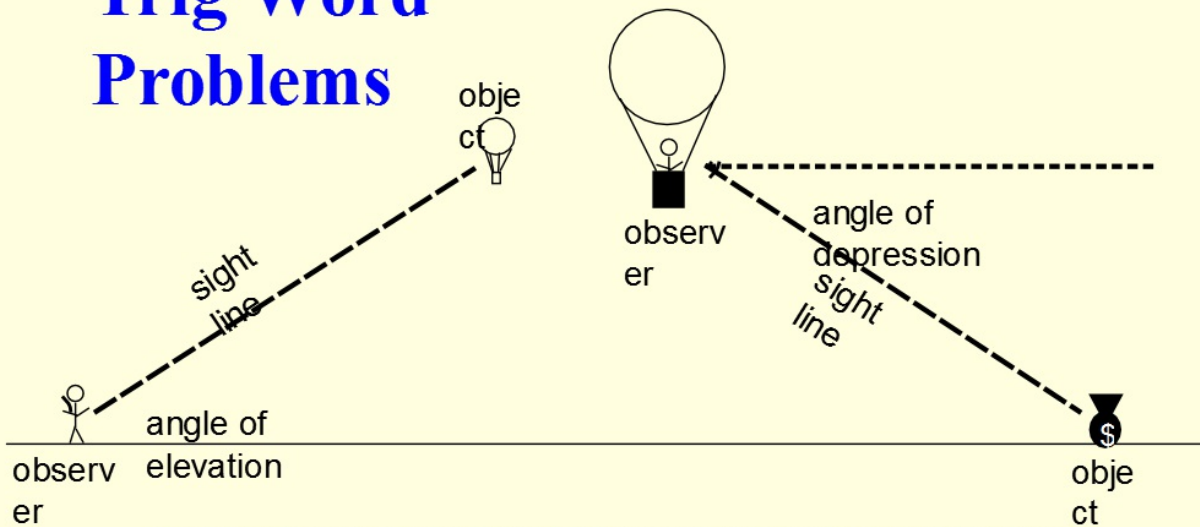
9. 302.11

10. 7

11. 45.25

12. 6

Trig Word Problems



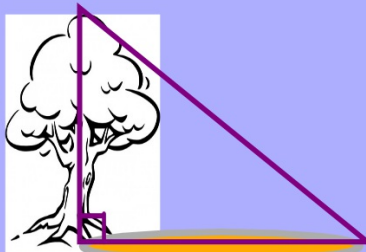
In order to solve trig word problems, follow these steps:

- 1) Draw a picture. (Right triangle)
- 2) Label the given parts.

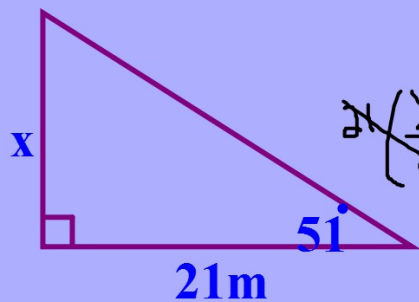
Examples:

1) A tree casts a shadow 21 m long. The angle of elevation of the sun is 51° . What is the height of the tree?

1) Draw a picture.



2) Label



$$\sin\left(\frac{x}{21}\right) = .9(21)$$

$$x = 18.9 \text{ m}$$

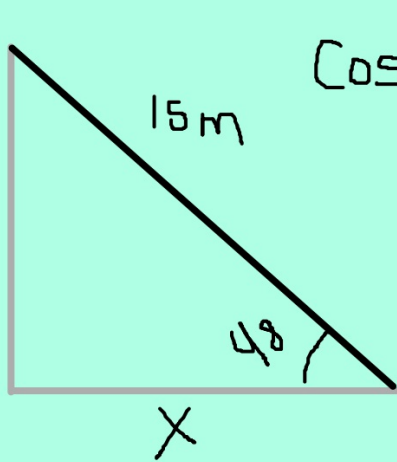
3) Trig ratios:

$$\text{Sine} = \frac{o}{h}$$

$$\text{Cosine} = \frac{a}{h}$$

$$\text{Tangent} \frac{o}{a} = \frac{x}{21} = \tan 51$$

2) A 15m pole is leaning against a wall. The angle of elevation of the pole is 48 degrees. How far is the base of the pole from the base of the wall?



$$\cos \frac{\text{Adj}}{\text{hyp}} = \frac{15X}{15} = .67(15)$$

$$X = 10.05$$

Your turn

3) From the top of a tower, the angle of depression to a stake on the ground is 72° . The top of the tower is 80 feet above ground. How far is the stake from the foot of the tower?

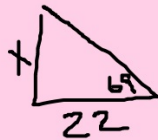
$$\frac{\text{adj}}{\text{opp}} = \tan 72$$

$$\frac{80}{x} = 3$$

$$80 = 3x$$

$$26.67 = x$$

4) At 2 P.M. the shadow of a lighthouse is 22 feet long and the angle of elevation is 69° . Find the height of the lighthouse.



$$\frac{\text{adj}}{\text{opp}}$$

$$\frac{22}{x} = \tan 69$$

$$\cong 8.54$$

5) A ladder leaning against a house makes an angle of 60° with the ground. The foot of the ladder is 7 feet from the foot of the house. How long is the ladder? $\cos = .50$

$$\frac{x}{7} = .5 \quad x = 3.5$$

6) A balloon on a 40-foot string makes an angle of 50° with the ground. How high above the ground is the balloon if the hand of the person holding the balloon is 6 feet above the ground?

$$\sin(50) = .77 \quad \frac{x}{40} = .77 \quad x = 30.8$$



Complete Worksheet

On-line and textbook help references: pp. 447-453

- <http://www.regentsprep.org/regents/math/algebra/AT2/LtrigW.htm>

- <https://www.khanacademy.org/math/trigonometry/basic-trigonometry/trig-application-problems/e/a-right-triangles>

<http://www.purplemath.com/modules/incldecl.htm>