

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

**Geometry**

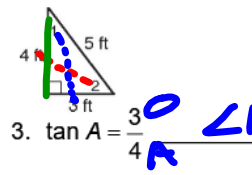
**Trig Ratio HW**

**Solving Right Triangles**

Use the given trigonometric ratio to determine whether  $\angle 1$  or  $\angle 2$  is  $\angle A$  in each exercise.

1.  $\sin A = \frac{4}{5}$   $\angle 2$

2.  $\cos A = \frac{4}{5}$   $\angle 1$



4.  $\sin A = \frac{3}{5}$  \_\_\_\_\_

5.  $\cos A = \frac{3}{5}$  \_\_\_\_\_

6.  $\tan A = \frac{4}{3}$  \_\_\_\_\_

Use a calculator to find each angle measure to the nearest degree.

7.  $\sin^{-1}(0.33)$   $19^\circ$

8.  $\cos^{-1}(0.47)$  \_\_\_\_\_

9.  $\tan^{-1}(1.21)$  \_\_\_\_\_

10.  $\sin^{-1}\left(\frac{9}{10}\right)$  \_\_\_\_\_

11.  $\cos^{-1}\left(\frac{1}{5}\right)$  \_\_\_\_\_

12.  $\tan^{-1}\left(2\frac{3}{4}\right)$  \_\_\_\_\_

Use a calculator and inverse trigonometric ratios to find the unknown side lengths and angle measures. Round lengths to the nearest hundredth and angle measures to the nearest degree.

13.   
 $AC = 3$    
 $m\angle B = \cos^{-1}\left(\frac{4}{5}\right) = 37^\circ$    
 $m\angle C = 53^\circ$

14.   
 $DE = 18$    
 $EF = \sin(51) = \frac{x}{18}$    
 $x = 18 \cdot \sin(51) = 13.76$    
 $EF = 13.76$    
 $m\angle D = 39^\circ$

15.   
 $GH =$  \_\_\_\_\_   
 $m\angle H =$  \_\_\_\_\_   
 $m\angle I =$  \_\_\_\_\_

14.   
 $AB =$  \_\_\_\_\_   
 $m\angle A =$  \_\_\_\_\_   
 $m\angle B =$  \_\_\_\_\_

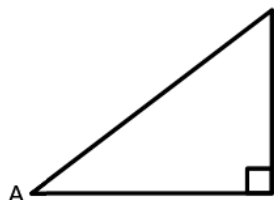
15.   
 $EF =$  \_\_\_\_\_   
 $m\angle D =$  \_\_\_\_\_   
 $m\angle F =$  \_\_\_\_\_

16.   
 $GH =$  \_\_\_\_\_   
 $GI =$  \_\_\_\_\_   
 $m\angle I =$  \_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

If  $\sin A = \frac{4}{5}$ , find  $\cos A$  and  $\tan A$ . Leave the answers in ratio form.

Then use a calculator to find  $m\angle A$  to the nearest tenth of a degree.



17.  $\cos A =$  \_\_\_\_\_ 18.  $\tan A =$  \_\_\_\_\_ 19.  $m\angle A =$  \_\_\_\_\_

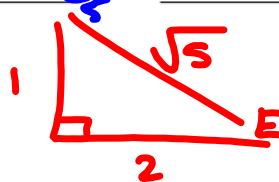
Given the value of one trigonometric function, find the other two. Leave the answers in ratio form. Rationalize fractions. Find angle measures to the nearest tenth of a degree.

20.  $\tan E = \frac{1}{2}$

$\angle E = 26.6^\circ$

$\sin E = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5}$

$\cos E = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$



$a^2 + b^2 = c^2$   
 $1^2 + 2^2 = c^2$   
 $5 = c^2$

21.  $\cos M = \frac{\sqrt{3}}{2}$

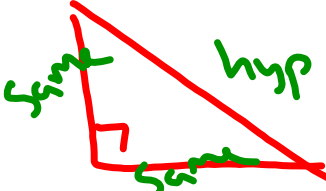
$\angle M =$  \_\_\_\_\_

22.  $\sin H = \frac{\sqrt{2}}{2}$

$\angle H =$  \_\_\_\_\_

23.  $\tan K = \sqrt{3}$

$\angle K =$  \_\_\_\_\_

$$\tan(H) = 1 = \frac{O}{A}$$


In right  $\triangle HJK$ ,  $\angle J$  is a right angle and  $\tan(H) = 1$ . Which statement about  $\triangle HJK$  must be true?

A.  $\sin(H) = \frac{1}{2}$

B.  $\sin(H) = 1$

C.  $\sin(H) = \cos(H)$   
 $\frac{\text{Same}}{\text{hyp}} \quad \frac{\text{Same}}{\text{hyp}}$

D.  $\sin(H) = \frac{1}{\cos(H)}$

There is a large tree 80 feet from a house. The owners are worried that the tree might their house if it fell and want to estimate the height of the tree. In the figure below, when the sun's angle of elevation is  $50^\circ$ , the tree casts a shadow 80 feet long. Which can be used to find the height of the tree?

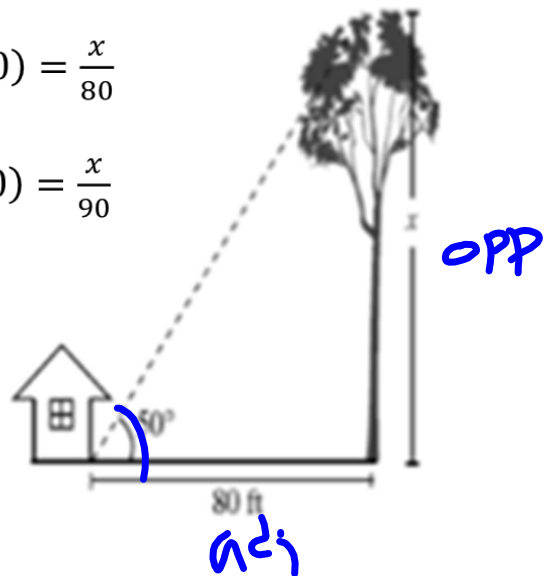
A.  $\sin(50) = \frac{80}{x}$

B.  $\tan(50) = \frac{x}{80}$

C.  $\cos(50) = \frac{80}{x}$

D.  $\sin(50) = \frac{x}{90}$

$$\tan(50) = \frac{x}{80}$$



## Solving Word Problems

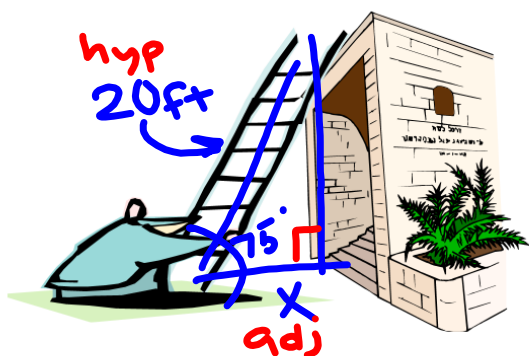
Use the 3 ratios – sin, cos and tan to solve application problems.

Choose the easiest ratio(s) to use based on what information you are given in the problem.

1. From a point 80m from the base of a tower, the angle of elevation is  $28^\circ$ . How tall is the tower?



2. A ladder that is 20 ft is leaning against the side of a building. If the angle formed between the ladder and ground is  $75^\circ$ , how far will Ms. McGinnis have to crawl to get to the front door when she falls off the ladder (assuming she falls to the base of the ladder)?



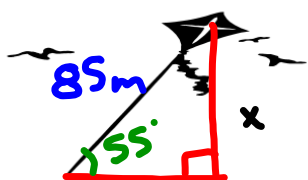
$$\cos(75^\circ) = \frac{x}{20}$$
$$x = 20 \cdot \cos(75^\circ)$$
$$x = 5.18 \text{ ft}$$

3. When the sun is  $62^\circ$  above the horizon, a building casts a shadow 18m long. How tall is the building?





4. A kite is flying at an angle of elevation of about  $55^\circ$ . Ignoring the sag in the string, find the height of the kite if 85m of string have been let out. a



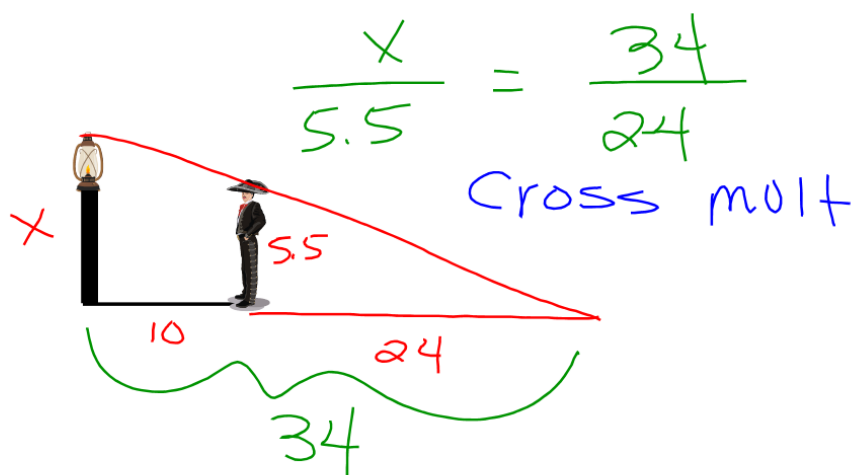
$$\sin(55^\circ) = \frac{x}{85}$$

x on top,  
multiply

$$x = 85 \cdot \sin(55)$$

$$x = 69.6 \text{ m}$$

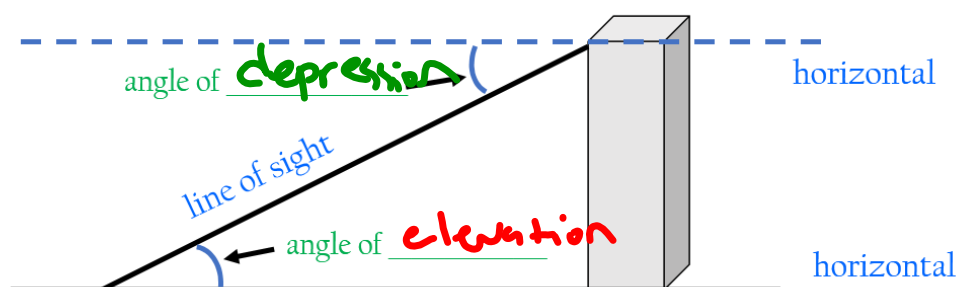
5. A 5.50 foot person standing 10 feet from a street light casts a 24 foot shadow. What is the height of the streetlight?



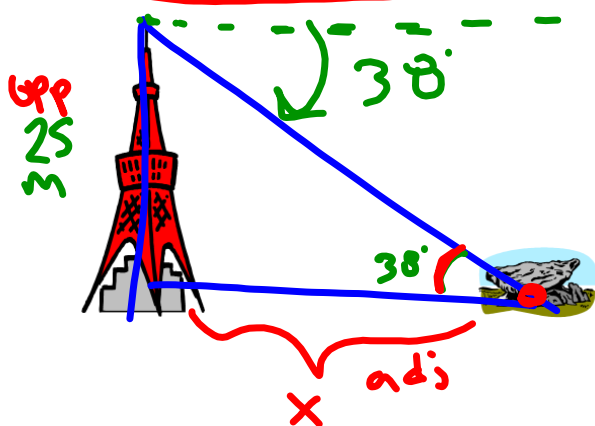
## Depression and Elevation

If a person on the ground looks up to the top of a building, the angle formed between the line of sight and the horizontal is called the angle of elevation.

If a person standing on the top of a building looks down at a car on the ground, the angle formed between the line of sight and the horizontal is called the angle of depression.



6. The angle of depression from the top of a tower to a boulder on the ground is  $38^\circ$ . If the tower is 25m high, how far from the base of the tower is the boulder?



$$\tan(38) = \frac{25}{x}$$

$$x = \frac{25}{\tan(38)} = 32 \text{ m}$$

