

SOHCAHTOA October 8, 2018, Monday

Find the measure of the indicated angle to the nearest degree.

1)  $\sin \theta = \frac{31}{34}$   
 $\theta = \sin^{-1}(\frac{31}{34})$   
 $\theta \approx 66^\circ$

Find the missing side. Round to the nearest tenth.

2)  $\cos \theta = \frac{a}{20}$   
 $\cos 39^\circ = \frac{a}{20}$   
 $a = 20 \cos 39^\circ$   
 $a \approx 15.7$

Find the value of each trigonometric ratio.

3)  $\tan Z = \frac{24}{10}$   
 $Z = \tan^{-1}(\frac{24}{10})$   
 $Z \approx 67.4^\circ$

Oct 4-10:42 AM

SOHCAHTOA

Math 2 Trig. Problem Solving Group Activity

Directions: Solve the following problems. If a drawing is not provided, create and label one and show all work. Be sure to include the correct units for all answers. Round to the nearest tenth. You may use your notes and homework problems.

EVERY PERSON MUST TURN IN HER/HIS PAPER. ONE PAPER WILL BE RANDOMLY CHOSEN TO BE GRADED. WORK ON ONE PROBLEM AT A TIME TOGETHER.

C-Level Problems:

1. Solve for  $x$ .

2. A helicopter is hovering above a road at an altitude of 24 m. At a certain time, the distance between the helicopter and a car on the road is 45.0 m. Calculate the angle of depression from the helicopter to the car.

3. A ramp has an angle of elevation of  $20^\circ$ . It has a vertical height of 1.8 m. What is the length of ramp?

OVER →

Oct 5-1:52 PM

B-Level Problems:

4. Cedar Point's Millennium Force is 310 feet high. Ralph is sitting on a bench eating an elephant ear and could see the top of Millennium Force at an angle of elevation of  $42^\circ$ . Bonnie is standing in line for the ring toss and could see the top of Millennium Force at an angle of elevation of  $50^\circ$ . Assuming that Ralph & Bonnie are straight across from each other and Millennium Force is between them, how far apart from each other are they?

5. Each base angle of an isosceles triangle has a measure of  $58^\circ$ . The base of the triangle has a length of 30 cm. Find the area of the triangle. ( $L = \frac{1}{2}bh$ )

A-Level Problem:

6. A person observes that from point A, the angle of elevation to the top of a cliff at D is  $30^\circ$ . Another person at point B, notes that the angle of elevation to the top of the cliff is  $45^\circ$ . If the distance between A and B is 80.0 m, find the distance between A and D.

Answers: 1. 19.1 2. 32.2° 3. 5.3m 4. 604.48 5. 160cm<sup>2</sup> 6. 58.6m

Oct 5-1:52 PM

October 9, 2018, Tuesday

Know SOHCAHTOA, because you need to decide which trig ratio to use!

Find the measure of the indicated angle to the nearest degree.

1)  $\sin \theta = \frac{59}{66}$   
 $\theta = \sin^{-1}(\frac{59}{66})$   
 $\theta \approx 59^\circ$

4)  $\tan \theta = \frac{30.4}{54}$   
 $\theta = \tan^{-1}(\frac{30.4}{54})$   
 $\theta \approx 29.4^\circ$

5)  $\tan \theta = \frac{47}{47}$   
 $\theta = \tan^{-1}(\frac{47}{47})$   
 $\theta = 45^\circ$

8)  $\sin \theta = \frac{30}{46}$   
 $\theta = \sin^{-1}(\frac{30}{46})$   
 $\theta \approx 36^\circ$

Choose 1 from the left & 1 from the right!

Oct 8-1:40 PM

Geometry Name \_\_\_\_\_ ID: 1

Know SOHCAHTOA, because you need to decide which trig ratio to use!

Find the measure of the indicated angle to the nearest degree.

1)  $\sin \theta = \frac{4}{14}$

2)  $\cos \theta = \frac{8}{28}$

3)  $\tan \theta = \frac{10}{14}$

4)  $\sin \theta = \frac{11}{14}$

5)  $\cos \theta = \frac{14}{18}$

6)  $\tan \theta = \frac{28}{18}$

7)  $\sin \theta = \frac{24}{30}$

8)  $\cos \theta = \frac{5}{14}$

9)  $\tan \theta = \frac{17}{18}$

10)  $\sin \theta = \frac{10}{18}$

Oct 5-1:53 PM

Find the missing side. Round to the nearest tenth.

11)  $\sin \theta = \frac{7}{14}$

12)  $\cos \theta = \frac{8}{14}$

13)  $\tan \theta = \frac{7}{14}$

14)  $\sin \theta = \frac{7}{14}$

15)  $\cos \theta = \frac{14}{18}$

16)  $\tan \theta = \frac{14}{18}$

17)  $\sin \theta = \frac{14}{18}$

18)  $\cos \theta = \frac{14}{18}$

19)  $\tan \theta = \frac{11}{18}$

Oct 5-1:53 PM

20)

Find the length of the side labeled  $x$ . Round intermediate values to the nearest tenth.

21)

22)

23)

24)

25)

26)

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Oct 5-1:54 PM

Geometry Name \_\_\_\_\_ ID: 1

Your pick the trigonometry ratio based on the information (SOHCAHTOA)

Find the value of each trigonometric ratio.

1)  $\cos C$

2)  $\sin d$

3)  $\tan d$

4)  $\sin d$

5)  $\cos C$

6)  $\tan C$

7)  $\sin X$

8)  $\tan C$

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9)  $\cos C$

10)  $\sin C$

11)  $\tan d$

12)  $\cos d$

13)  $\sin X$

14)  $\cos Z$

15)  $\sin C$

16)  $\tan X$

A)  $\frac{3}{4}$  B)  $\frac{3}{5}$   
C)  $\frac{4}{5}$  D)  $\frac{4}{3}$

17)  $\sin X$

A)  $\frac{4}{5}$  B)  $\frac{5}{3}$   
C)  $\frac{3}{4}$  D)  $\frac{4}{3}$

18)  $\cos Z$

A)  $\frac{3}{5}$  B)  $\frac{4}{5}$   
C)  $\frac{4}{3}$  D)  $\frac{3}{4}$

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Geometry Name \_\_\_\_\_ ID: 1

Your pick the trigonometry ratio based on the information (SOHCAHTOA)

Find the value of each trigonometric ratio.

1)  $\cos C$

2)  $\sin d$

3)  $\tan d$

4)  $\sin d$

5)  $\cos C$

6)  $\tan C$

7)  $\sin X$

8)  $\tan C$

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9)  $\cos C$

10)  $\sin C$

11)  $\tan d$

12)  $\cos d$

13)  $\sin X$

14)  $\cos Z$

15)  $\sin C$

16)  $\tan X$

A)  $\frac{3}{4}$  B)  $\frac{3}{5}$   
C)  $\frac{4}{5}$  D)  $\frac{4}{3}$

17)  $\sin X$

A)  $\frac{4}{5}$  B)  $\frac{5}{3}$   
C)  $\frac{3}{4}$  D)  $\frac{4}{3}$

18)  $\cos Z$

A)  $\frac{3}{5}$  B)  $\frac{4}{5}$   
C)  $\frac{4}{3}$  D)  $\frac{3}{4}$

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Unit 1 - Transformations in the Coordinate Plane  
Unit 2 - Similarity, Congruence, Solids  
Unit 3 - Right Triangle Trigonometry  
Pre-Calculus/Honors Precalculus  
AP Calculus  
Online Edgenuity  
ACT/SAT Prep

The trigonometric functions are: **adj**  
**sine, cosine, tangent, cotangent, secant, and cosecant.**

UNIT 3 - RIGHT TRIANGLE TRIGONOMETRY  
Students will apply similarity in right triangles to understand right triangle trigonometry. Students will use the Pythagorean Theorem and the relationship between the sine and cosine of complementary angles to solve problems involving right triangles.

The following will take you to activities that will provide a better understanding of materials in unit 3.

SOH CAH TOA explained, Gamick  
Tangent Ratio explained, Owens  
Sine Ratio explained, VirtuallHero  
Cosine Ratio explained, VirtuallHero  
Geogebra, right triangle trig, Brzezinski  
Geogebra, right triangle trig, ayoub

Practice for unit 3 materials:  
Basic Trig Quiz 9 questions, Buzzfeednews  
Basic Trig Quiz 17 questions, Math10.com  
Basic Trig Word Problems 5, Multiverse360


Today! Some online practice!  
Write your calculations/answers on a sheet of notebook paper, please!

Oct 4-10:27 AM


October 10, 2018, Wednesday

3. A ramp has an angle of elevation of  $20^\circ$ . It has a vertical height of 1.8 m. What is the length of ramp?

Find x

23) 

1)  $\cos A$



A)  $\frac{3}{5}$  B)  $\frac{4}{3}$   
C)  $\frac{4}{5}$  D)  $\frac{5}{3}$

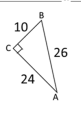
Oct 9-1:26 PM

SG

Unit 3 **§10.1** – Missing Sides & Angles Name \_\_\_\_\_

Given triangle ABC, find the following six trig ratios, simplest form required.

1)  $\sin A = \frac{\quad}{\quad}$  4)  $\sin B = \frac{\quad}{\quad}$   
2)  $\cos A = \frac{\quad}{\quad}$  5)  $\cos B = \frac{\quad}{\quad}$   
3)  $\tan A = \frac{\quad}{\quad}$  6)  $\tan B = \frac{\quad}{\quad}$





Round all remaining questions to two decimals. Use for questions 7 – 10.

In  $\triangle ABC$ ,  $m\angle ACB = 90^\circ$  and  $\sin B = \frac{39}{65}$

7) Draw triangle ABC. 8) What is the length of BC?


9) What is  $\cos A$ ? 10) What is  $\tan A$ ?


11) Solve for x. 

12) Solve for  $\theta$ . 

GSE GEOMETRY 1 | Page 6

Oct 4-10:27 AM

13) Solve for x and y. 

14) Solve for all missing sides and all missing angles in the triangle below round to the nearest tenth. 

15) Evaluate  $\tan^{-1}(\sqrt{4096})$

16) Is there an acute angle, such that  $\sin A = \cos A$ ? If so, what is the measure of the angle?

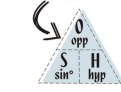
GSE GEOMETRY 2 | Page 6

Oct 4-10:27 AM

Hertel/Williams/Lambert


## TRIGONOMETRY PACKET GEOMETRY HONORS

*Color the letters you want to mark out below in the triangles and either multiply (horizontal connection) or divide (vertical connection)!*




**SOH**

S: opp  
O: sin  
H: hyp



**CAH**

C: adj  
A: cos  
H: hyp




**TOA**


T: opp  
O: tan  
A: adj

*Hypotenuse      Adjacent      Opposite*


Oct 4-10:31 AM

**Example:** 


$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 1:** 


$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 2:** 


$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 3:** 


$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 4:** 


$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 5:** 


$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 6:** 


$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 7:** 

$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 8:** 

$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 9:** 

$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

**Example 10:** 

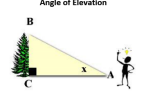
$\sin \alpha = \frac{10}{20} = \frac{1}{2}$   
 $\cos \alpha = \frac{\sqrt{3}}{2}$   
 $\tan \alpha = \frac{1}{\sqrt{3}}$

Oct 4-10:31 AM

**SWBAT:** 1) Solve problems involving angle of elevation/depression, and 2) Express sine and cosine in terms of its CoFunction.

**Real World Connection:** Trigonometry can be used on a daily basis in the workplace. Since trigonometry means "triangle measure", any profession that deals with measurement deals with trigonometry as well. Carpenters, construction workers and engineers, for example, must possess a thorough understanding of trigonometry.

**Angle of Elevation**

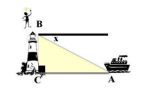


The **angle of elevation** is always measured from the ground up. Think of it like an observer that only goes up. It is always **INSIDE** the triangle.

In the diagram at the left, x marks the angle of elevation of the top of the tree as seen from a point on the ground.

You can think of the angle of elevation as relation to the movement of your eyes. You are looking straight ahead and you must raise (elevation) your eyes to see the top of the tree.

**Angle of Depression**



The **angle of depression** is always **OUTSIDE** the triangle. It is never inside the triangle.

In the diagram at the left, x marks the angle of depression of a boat at sea from the top of a lighthouse.

You can think of the angle of depression as relation to the movement of your eyes. You are standing at the top of the lighthouse and you are looking straight ahead. You must lower (depress) your eyes to see the boat in the water.


There are two possible ways to see an **angle of depression** to obtain an angle **INSIDE** the triangle.

- Find the angle adjacent (next door) to one angle which is inside the triangle. This adjacent angle always is the complement of the angle. Our angle and the angle next door will add to  $90^\circ$ . In the diagram on the left, the adjacent angle is  $35^\circ$ .
- Utilize the fact that the **angle of depression** = the angle of elevation and simply place  $180^\circ$  in the angle.

**A. (Blue arrow method)** Just be sure to place it on the correct vertex.


Oct 4-10:38 AM

1) Find the length of side  $a$  and the measure of angle  $B$ , as shown in the diagram. Give each answer rounded to the nearest whole number or degree.



**Example 1:**  
From an airplane 6000 ft above the ground, you see a landing strip at an angle of depression of  $24^\circ$ . Measuring the distance along the ground, how far are you from the landing strip? Round your answer to the nearest hundredth.


1.) From a point on the ground 25 feet from the foot of a tree, the angle of elevation of the top of the tree is  $32^\circ$ . Find to the nearest foot, the height of the tree.



2.) A lookout spots a fire from a 32-meter tower. The angle of depression from the tower to the fire is  $13^\circ$  degrees. To the nearest meter, how far is the fire from the base of the tower?

3.) To find the height of a pole, a surveyor moves 50 feet away from the base of the pole and then, with a transit 4 feet tall, measures the angle of elevation to the top of the pole to be  $57^\circ$ . What is the height of the pole? Round answer to the nearest foot.

**Example 2:**  
Refer to the triangle below:



a) What is the relationship between  $m\angle A$  and  $m\angle B$ ? \_\_\_\_\_  
 b) What is the  $\cos A$ ? \_\_\_\_\_ What is the  $\sin B$ ? \_\_\_\_\_  
 c) What is the  $\sin A$ ? \_\_\_\_\_ What is the  $\cos B$ ? \_\_\_\_\_

9) Find the value of  $x$  for which  $\sin x = \cos 15$  is true.

10) Find the value of  $x$  for which  $\sin x = \cos 15$  is true.

What do you notice about the cosine and sine of complements?  
 \_\_\_\_\_

Oct 4-10:37 AM

1)  $\sin 15^\circ = \cos 75^\circ$   
 This is true since  $15 + 75 = 90$ .

2)  $\cos 40^\circ = \sin$  \_\_\_\_\_

3)  $\cos 8^\circ =$  \_\_\_\_\_

4)  $\sin 26^\circ =$  \_\_\_\_\_

5)  $\sin 43^\circ = \cos$  \_\_\_\_\_

6)  $\cos 2^\circ =$  \_\_\_\_\_

7)  $\cos 17^\circ =$  \_\_\_\_\_

8)  $\sin 70^\circ =$  \_\_\_\_\_

Oct 4-10:40 AM

(Empty box for student work)

Oct 4-10:55 AM