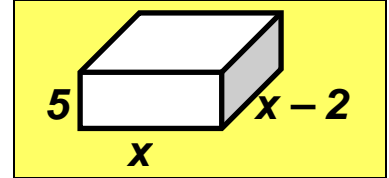


Performance Objective: Exploration of the Right Triangle: Trigonometry

Homework #9RT1 – NYA p.648 #1 – 17 (odd), 36 p.654 #1 – 6

Do Now: Write the formulas for surface area and volume of the figure to the right.



State Test Prep: Which set of side lengths represents a right triangle?

A. 2, 2, 8

B. 5, 12, 13

C. 3, 5, 6

D. 10, 20, 60

Ratios of the sides of right triangles are called trigonometric ratios. The hypotenuse is the longest leg. The adjacent and opposite sides are named in reference to an angle that is not the right (90°) angle.

Sine of ∠1	Cosine of ∠1	Tangent of ∠1	
$\sin(\angle 1) = \frac{\text{opp}}{\text{hyp}}$	$\cos(\angle 1) = \frac{\text{adj}}{\text{hyp}}$	$\tan(\angle 1) = \frac{\text{opp}}{\text{adj}}$	

SOHCAHTOA – Trigonometric ratio memory device

S	ine	<p><u>Example</u></p> $\sin \angle CAB = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{3}{5} = 0.6$ $\cos \angle CAB = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{4}{5} = 0.8$ $\tan \angle CAB = \frac{\text{opposite}}{\text{adjacent}} = \frac{3}{4} = 0.75$ <p><u>Practice</u></p> <ol style="list-style-type: none"> 1) What is the sine ratio of ∠ACB? 2) What is the cosine ratio of ∠ACB? 3) What is the tangent ratio of ∠ACB? 	
O	pposite		
H	ypotenuse		
C	osine		
A	djacent		
H	ypotenuse		
T	angent		
O	pposite		
A	djacent		

Trigonometry on your calculator: Use your trigonometric functions with the given angle to obtain estimates of the ratios from above. You will see that the calculator gives you a value that is approximately equal to the matching ratio.

Calculator Practice (nearest .0001) – You Must Be In “Degree Mode”

1. $\sin(30^\circ) =$	2. $\cos(45^\circ) =$	3. $\tan(45^\circ) =$
4. $\sin(15^\circ) =$	5. $\cos(90^\circ) =$	6. $\tan(70^\circ) =$

Practice

Evaluate the trigonometric ratios for angle $\angle EDF$ in the triangle at the right to the nearest hundredth.		
Identify the sides: The hypotenuse is \overline{DF} . The opposite leg is \overline{EF} . The adjacent leg is \overline{DE}		
Find the trigonometric ratios:		$\sin \angle EDF = \frac{\text{opp}}{\text{hyp}} = \frac{12}{13} = 0.92$
$\cos \angle EDF = \frac{\text{adj}}{\text{hyp}} = \frac{5}{13} = 0.38$	$\tan \angle EDF = \frac{\text{opp}}{\text{adj}} = \frac{12}{5} = 2.40$	

Evaluate the trigonometric ratios for angle $\angle HFG$ in the triangle at the right to the nearest hundredth.		
a. Hypotenuse. _____	d. $\sin \angle HFG = \frac{\text{opp}}{\text{hyp}} = \text{_____}$	
b. Opposite leg to $\angle HFG$. _____	e. $\cos \angle HFG = \frac{\text{adj}}{\text{hyp}} = \text{_____}$	
c. Adjacent leg to $\angle HFG$. _____	f. $\tan \angle HFG = \frac{\text{opp}}{\text{adj}} = \text{_____}$	

Fill in the blanks.		
g. Hyp = _____	j. $\sin \angle XYZ = \text{_____}$	
h. Opp leg to $\angle XYZ = \text{_____}$	k. $\cos \angle XYZ = \text{_____}$	
i. Adj leg to $\angle XYZ = \text{_____}$	l. $\tan \angle XYZ = \text{_____}$	

Find the Missing Side Length – Pythagorean Theorem Connection

Find x.	Find k.	Find h.

Inverse Trigonometry Functions

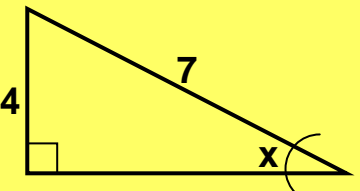
Find the inverse Trigonometry functions on your calculator: \sin^{-1} \cos^{-1} \tan^{-1}

Note: The negative one exponent is a notation in Algebra that means “inverse” function. It is not the “negative one power” and should not be spoken that way. Read it as the “inverse sine” or whatever ratio applies.

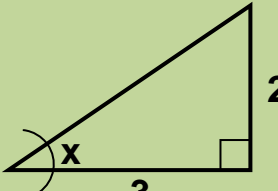
When do you use inverse Trig?

You Have	You Need	You Use
2 side lengths	1 missing side length	Pythagorean Theorem
1 side length, 1 angle	1 missing side length	sin, cos, tan
2 side lengths	1 missing angle	\sin^{-1} \cos^{-1} \tan^{-1}

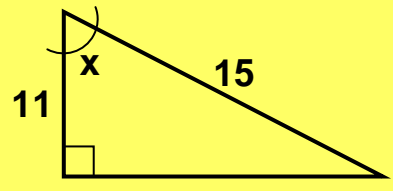
Practice: Find angle “x” to the nearest tenth of a degree



1.



2.



3.

More Practice: No Diagram

In $\triangle ABC$, $\angle C$ is the right angle. Find all remaining sides and angles.

1. $AB = 8$, $AC = 2$
 $BC =$
 $\angle A =$
 $\angle B =$

2. $AC = 10$, $BC = 5$
 $AB =$
 $\angle A =$
 $\angle B =$