Honors Math 2 Unit 8: Trigonometry Name: ____________________

G-SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

G-SRT.9 (+) Derive the formula $A = 1/2\ ab\sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.

F-IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Date	Activity
Thursday, May 12	Exploring Angle Restrictions and Classifying Triangles
Friday, May 13	Graphing Sine and Cosine
Monday, May 16	Pythagorean Theorem and SOHCAHTOA
Tuesday, May 17	QUIZ and Area of Oblique Triangles
Wednesday, May 18	Angles of elevation and depression
Thursday, May 19	Law of Cosines
Friday, May 20	Law of Sines
Monday, May 23	Laws of Trig Practice
Tuesday, May 24	Review
Wednesday, May 25	Test

Sine, Cosine and Tangent in the Calculator

I. Evaluate an Expression

a. To evaluate an expression means to ________________ a given value in for a variable and ________________

b. Evaluate the following:

i. $3x$ if $x = 6$

ii. $-4x^2 - 7x + 2$ if $x = -6$

II. Sine, Cosine and Tangent

a. Sine, Cosine and Tangent are ____________________ functions that are related to triangles and angles

i. We will discuss more about where they come from later! ☺

b. We can evaluate a _________, _________ or ___________ just like any other expression

c. We have buttons on our calculator for sine, cosine and tangent

i. Sine → [ ]

ii. Cosine → [ ]

iii. Tangent → [ ]

d. When evaluating sine, cosine or tangent, we must remember that the value we substitute into the expression represents an _________.

e. Angles are measured in

i. __________

ii. __________

f. We have to check our mode to make sure the calculator knows what measure we are using!

i. In this class, we will always use Degrees, but you should know that radians exist!

[ ] → Make sure Degree is highlighted!

g. For some angles, ________ will be ____________.

h. This means there is an _____________ at this value.

i. Evaluate the following:

1. $\sin(52^{\circ})$

2. $\cos(122^{\circ})$

3. $\tan(-76^o)$

4. $\cos(45^o)$

5. $\sin(30^o)$

6. $\tan(90^o)$

7. tan (5 radians)

III. Solving Equations

a. To solve an equation means to "__________" all the operations to get the variable by itself

b. To "undo" an operation means to use the ____________________

   i. The inverse operation of addition is _______________

   ii. The inverse operation of multiplication is ______________

   iii. The inverse operation of squaring is __________________

c. Solve the following equations using inverse operations:

   i. $3x + 5 = 14$

   ii. $2x^2 + 4 = 76$

IV. Solving Sine, Cosine and Tangent Equations

a. We can solve equations involving __________, ____________ and _______________ just like any other equation!

b. Inverse operations of sine, cosine and tangent

   i. Sine → [ ]

   ii. Cosine → [ ]

   iii. Tangent → [ ]

c. For some values, _________and ________ will not have a solution!

d. Solve the following equations and express your answer in degrees:

   1. $\sin(x) = 0.6$

   2. $\cos(x) = 1.5$

   3. $\tan(x) = -6.7$

   4. $\cos(x) = -0.87$

   5. $\sin(x) = 0.5$

Evaluating Trigonometric Functions Practice

I. Evaluate each of the following using your calculator (round to the nearest thousandth.

1. sin (62^o)
2. cos (132^o)
3. tan (-87^o)
4. cos (178^o)
5. sin (-60^o)
6. sin (78^o)
7. cos (-13^o)
8. tan (95^o)
9. cos (778^o)
10. sin (225^o)
11. tan (90^o)
12. sin (3.4 radians)

II. Solve the following equations and express your answer in degrees:

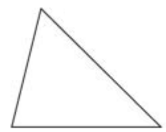
1. sin (x) = 0.8
2. cos (x) = -1.7
3. tan (x) = -9.5
4. cos (x) = -0.78
5. sin (x) = 0.366
6. sin (x) = -0.768
7. -1cos (x) = -0.72
8. 3tan (x) = -12.8
9. 4cos (x) – 6 = -5.2
10. 3sin (x) + 4 = 1.57
11. tan (x) = 3.27
12. 2sin (x) + 5sin (x) – 6 = -2

Review: Right Triangles and Their Parts

I. Classifying Triangles by their angles

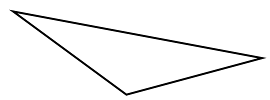
a. Acute Triangle

i. An acute triangle is a triangle that has ________________ __________



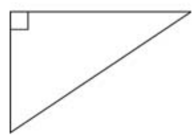
b. Obtuse Triangle

i. An obtuse triangle is a triangle that has ________________ __________



c. Right Triangle

i. A right triangle is a triangle that has __________________ __________



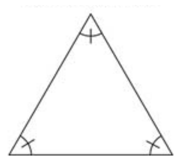
d. Oblique Triangle

i. An oblique triangle is a _____________________

ii. These can be _________ triangles or _________ triangles

e. Equiangular Triangle

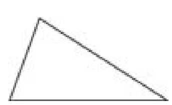
i. An equiangular triangle is a triangle that has _____________ __________



II. Classifying Triangles by their sides

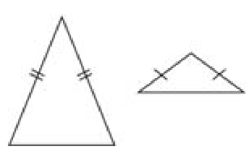
a. Scalene Triangle

i. A scalene triangle is a triangle that ____________________



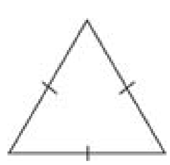
b. Isosceles Triangle

i. An isosceles triangle is a triangle that has _______________ ____________



c. Equilateral Triangle

i. An equilateral triangle is a triangle that has _____________ ____________



III. Right Triangles and Special Sides

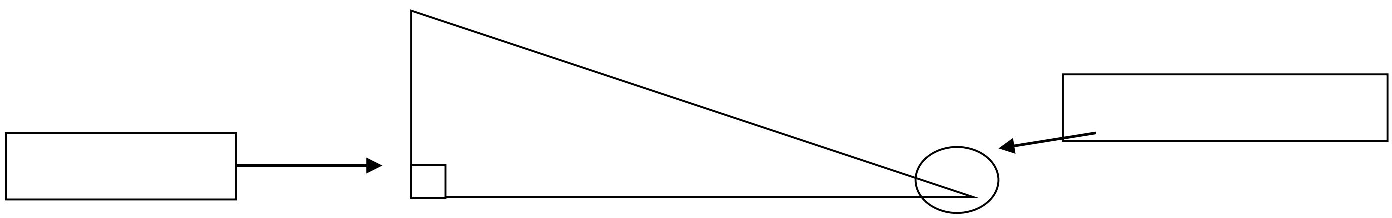
a. A right triangle has three special sides

b. These sides are dependent on the angles: a _______________ and a _________________________

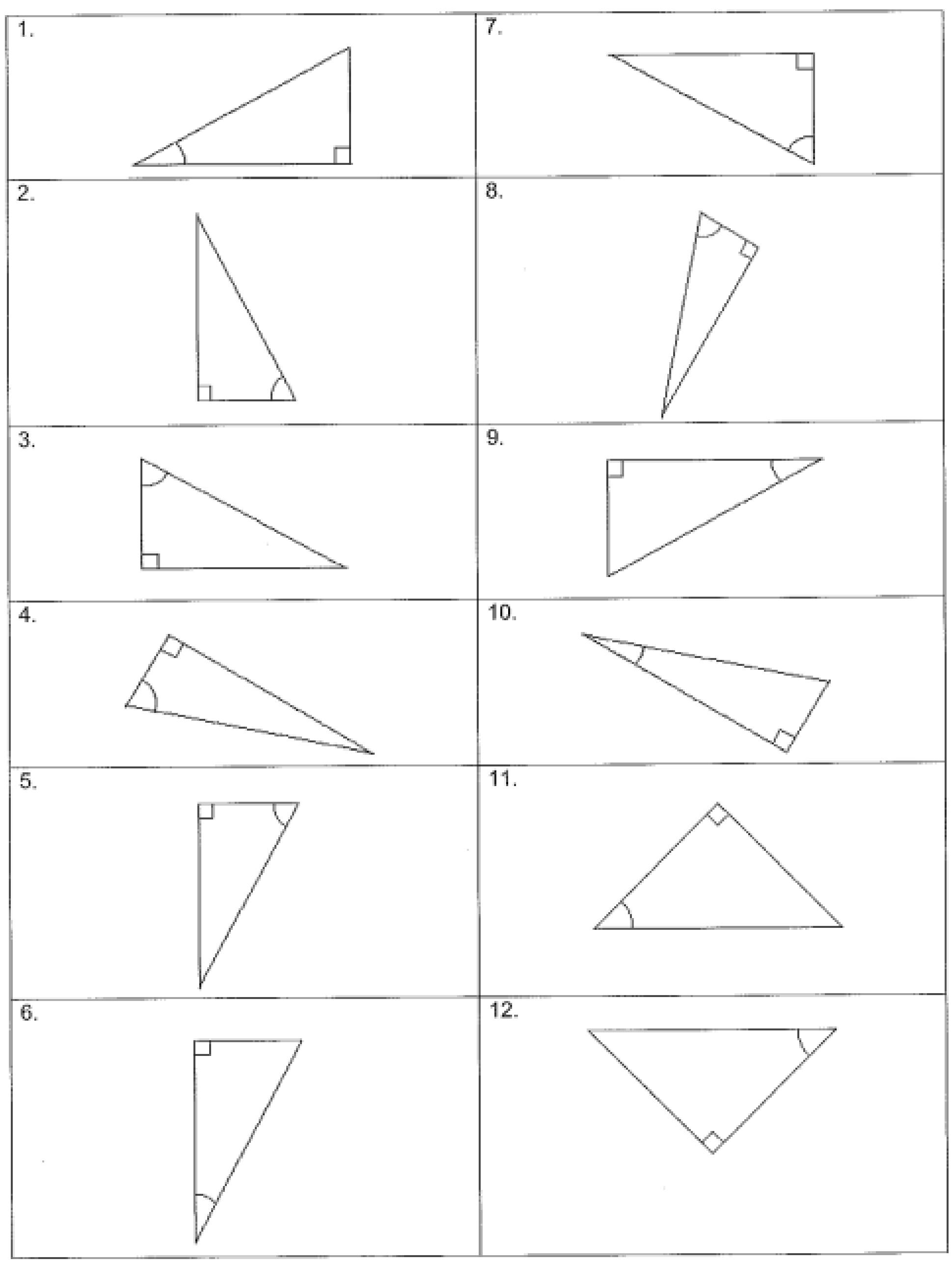
i. Hypotenuse – _______________________________

ii. Opposite Leg – ______________________________

iii. Adjacent Leg – _____________________________



Practice: Label the triangles below using H for hypotenuse, O for opposite and A for adjacent. The reference angle is the one with the arc marking in it.



Exploring Sine, Cosine and Tangent Angle Restrictions

Using your calculator, complete the chart:

Angle	sin(angle)	cos(angle)	tan(angle)
0			
30			
60			
90			
120			
150			
180			
210			
240			
270			
300			
330			
360			

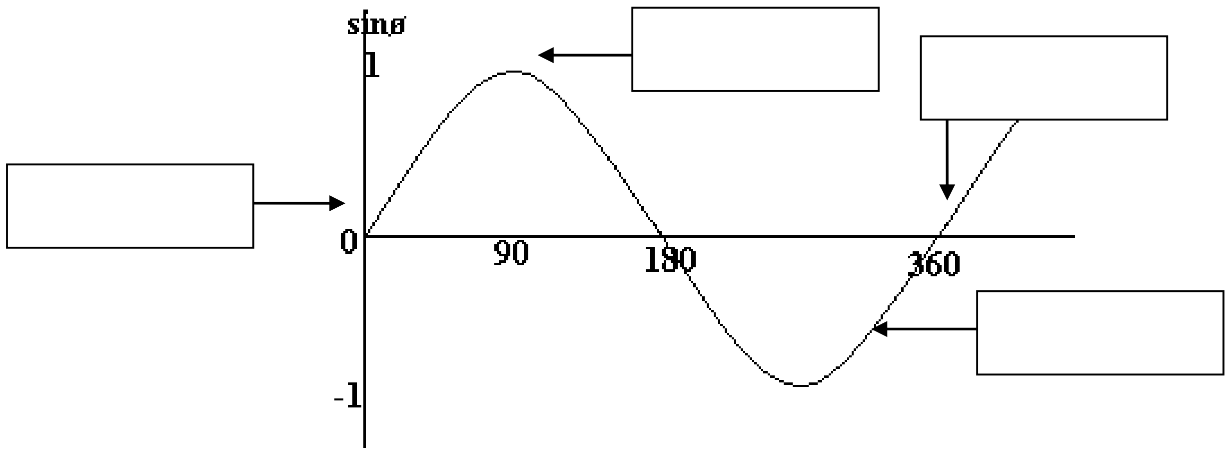
1. What do you notice about the sine column? Describe the pattern.

2. What do you notice about the cosine column? Describe the pattern.

3. What do you notice about the tangent column? Describe the pattern.

Graphing and Understanding Sine, Cosine and Tangent

I. Sine Graph



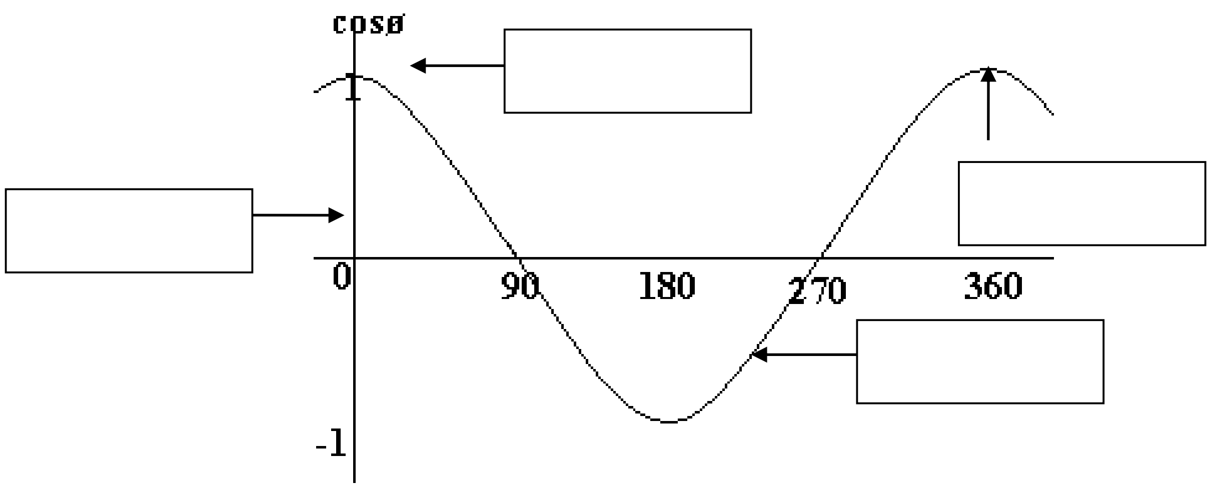
a. Sine is increasing:

c. Sine is positive:

b. Sine is decreasing:

d. Sine is negative:

II. Cosine Graph



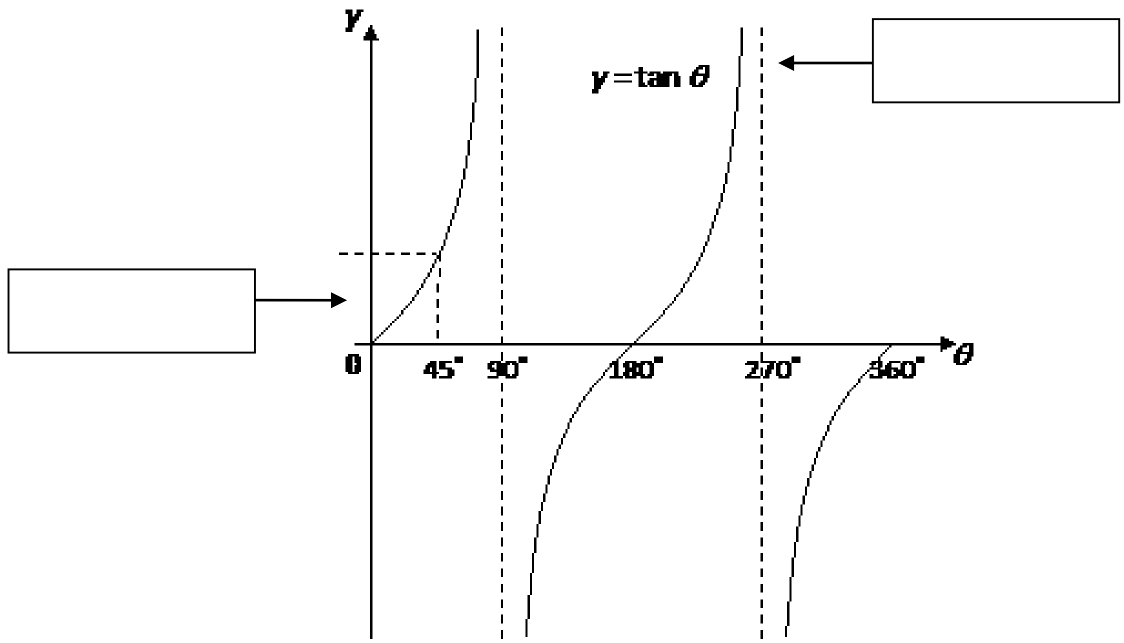
a. Cosine is increasing:

c. Cosine is positive:

b. Cosine is decreasing:

d. Cosine is negative:

III. Tangent Graph



a. Tangent is increasing:

b. Tangent is decreasing:

c. Tangent is positive:

d. Tangent is negative:

<u>**Sine and Cosine Graphs Practice**</u>

Match each equation with the correct graph.

A. $y = cos\ (x)$

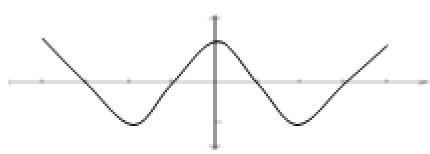
B. $y = sin\ (x)$

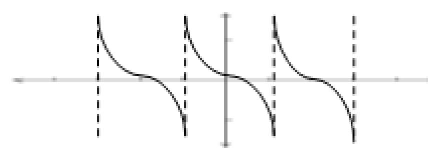
C. $y = -cos\ (x)$

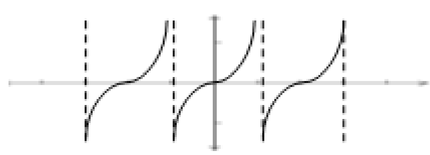
D. $y = -sin\ (x)$

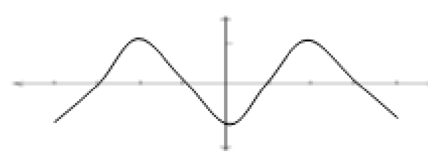
E. $y = tan(x)$

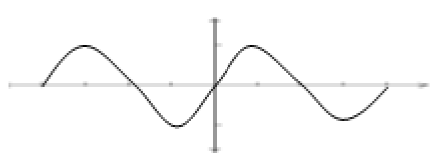
F. $y = -tan(x)$

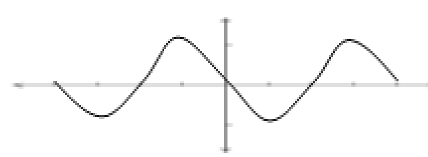






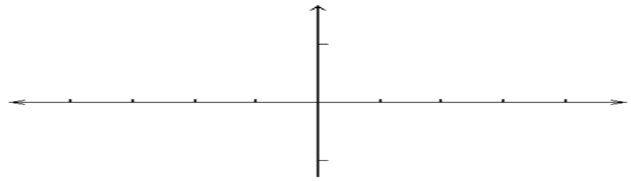




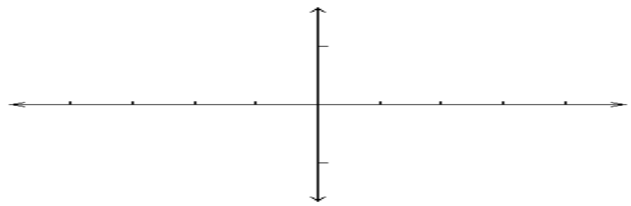


I. Sketch each of the following using what you know about sine and cosine. Label the five key points.

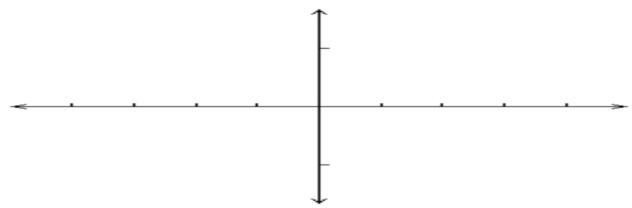
1. $y = cos\ (x)$



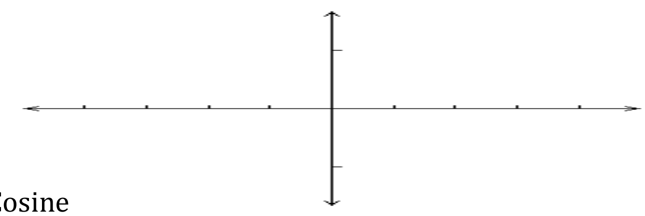
2. $y = sin\ (x)$



3. $y = -cos\ (x)$



4. $y = -sin\ (x)$



II. Understanding Sine and Cosine

5. If you were graphing $y = sin\ (x)$ in the calculator, what would your window need to be?

Xmin: _____ Xmax: _____ Xscl: _____ Ymin: _____ Ymin: _____ Yscl: _____

6. If you were graphing $y = cos\ (x)$ in the calculator, what would your window need to be?

Xmin: _____ Xmax: _____ Xscl: _____ Ymin: _____ Ymin: _____ Yscl: ____

Complete the following table:

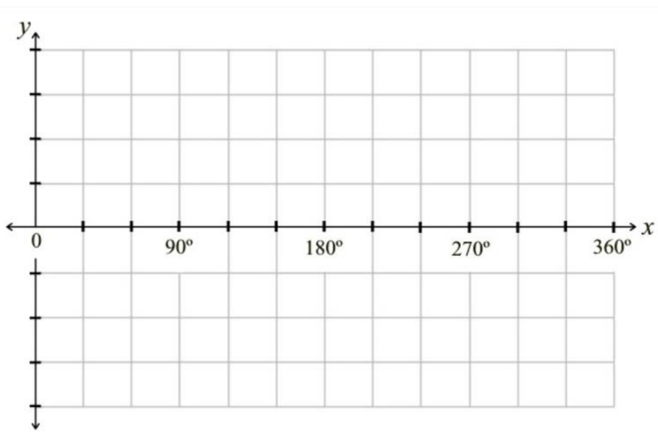
Function	$y = sin(x)$	$y = cos\ (x)$
Amplitude		
Period		
Midline		
Maximum Value		
Minimum Value		

Exploring Amplitude and Midline

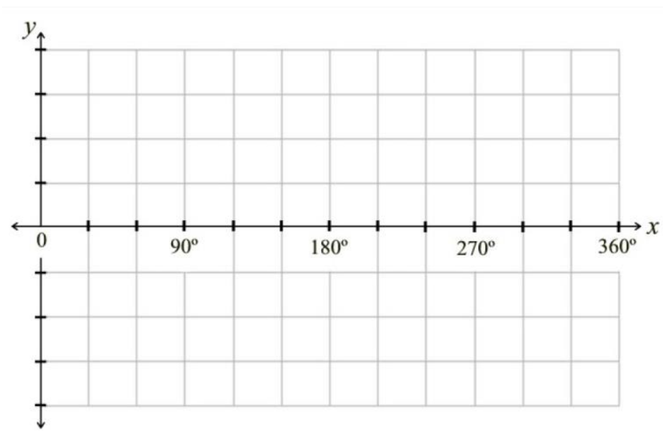
1. Complete the following table:

Degree	y = sinx	Y = 3sinx
0		
30		
60		
90		
120		
150		
180		
210		
240		
270		
300		
330		
360		

2. Graph y = sinx



3. Graph y = 3sinx

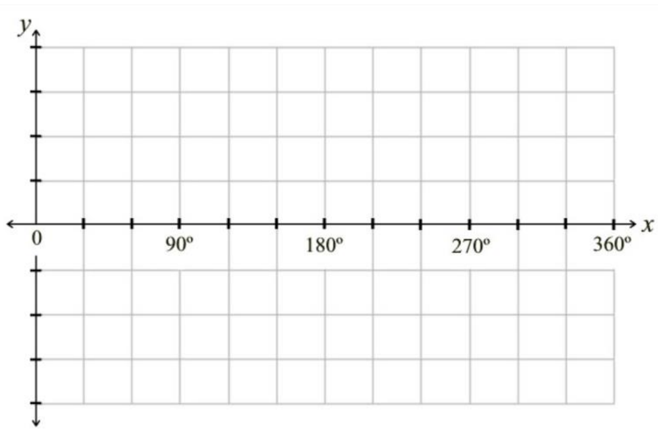


4. How are the graphs alike? How are they different?

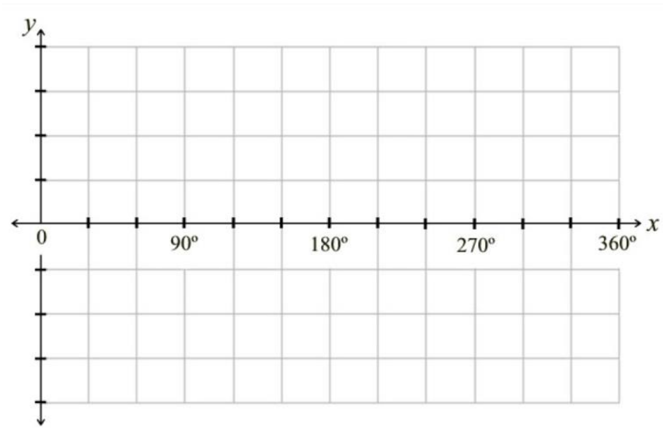
5. Complete the following table:

Degree	y = sinx	Y = (1/2)sinx
0		
30		
60		
90		
120		
150		
180		
210		
240		
270		
300		
330		
360		

6. Graph y = cosx



7. Graph y = (1/3)cosx



8. How are the graphs alike? How are they different?

Basics of Sine and Cosine Graphs

I. Amplitude

a. A graph in the form ______________ or _______________ has an amplitude of ____________.

b. The amplitude of a standard __________ or ___________ graph is _____.

c. The amplitude of a sine or cosine graph can be found from an equation using the following formula:

d. Find the amplitude for each of the following:

1. y = 3sinx

2. y = -4cos5x

3. y = (1/3)sinx +5

II. Midline

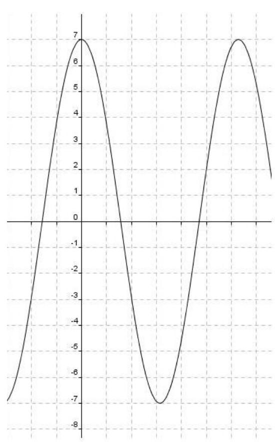
a. The midline is the line that ____________________________

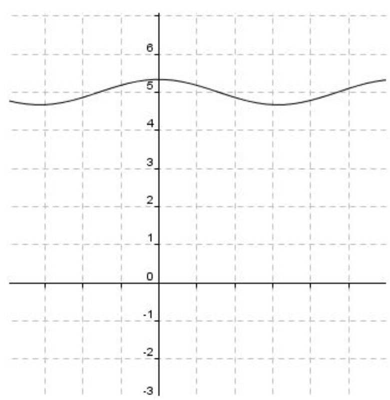
b. The midline is halfway between the _________ and __________

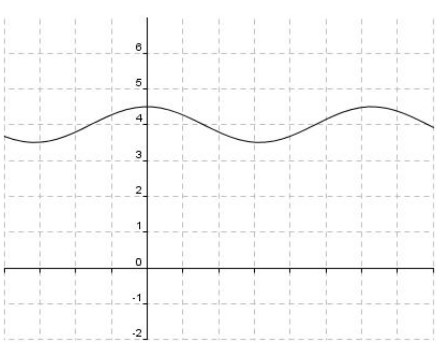
c. The midline can be found from an equation using the following formula:

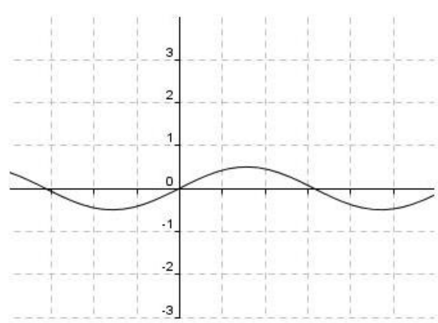
d. When there is no vertical shift, the midline is always ___________.

a. Find the amplitude and midline for each of the following graphs:

1. 

2. 

3. 

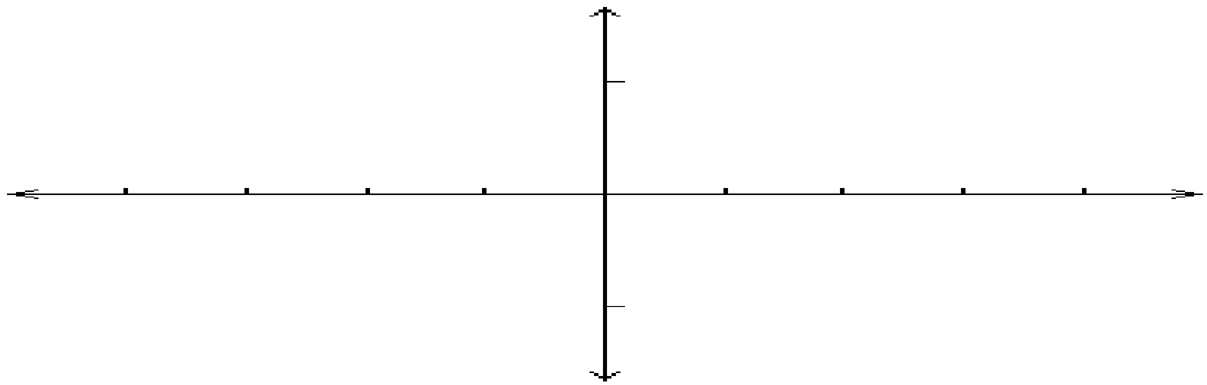
4. 

Graphing Sine and Cosine

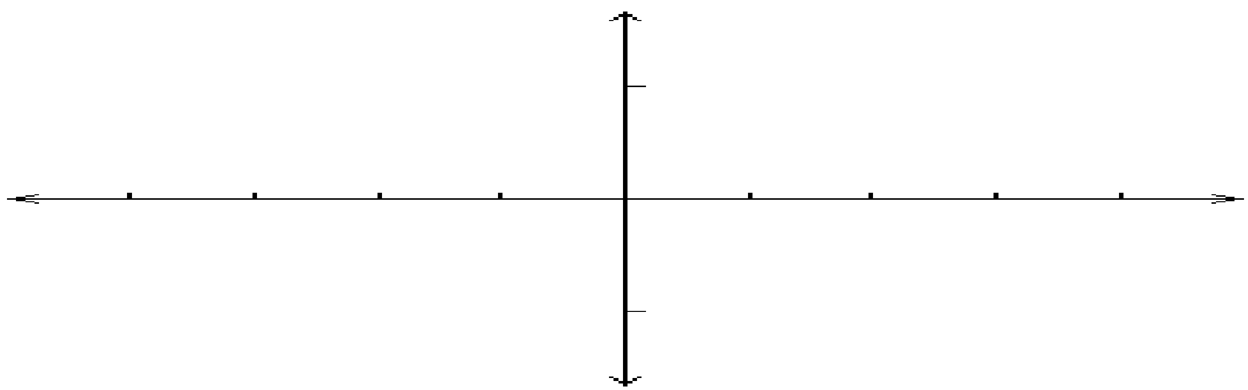
Practice Worksheet

Graph the following functions over two periods, one in the positive direction and one in the negative directions. Label the axes appropriately.

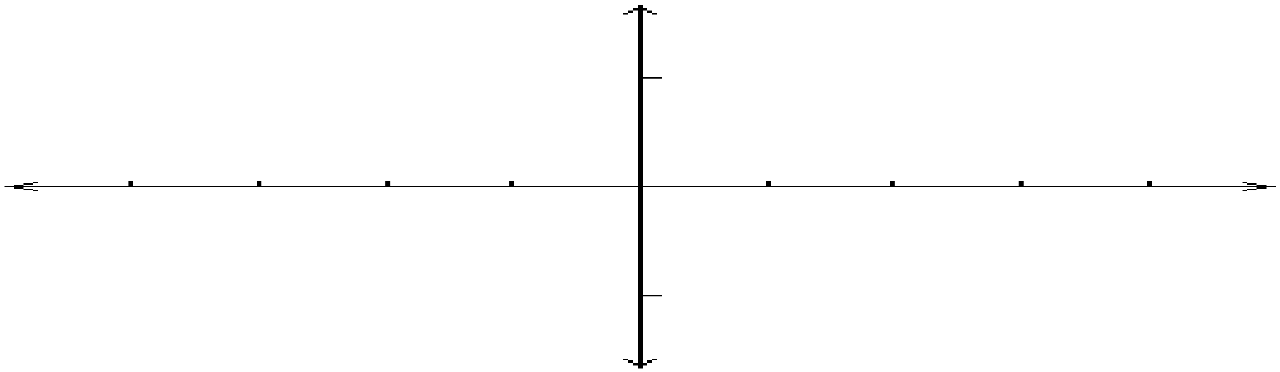
1. $y = 3\cos(x)$ Amplitude: ________ Midline: ________



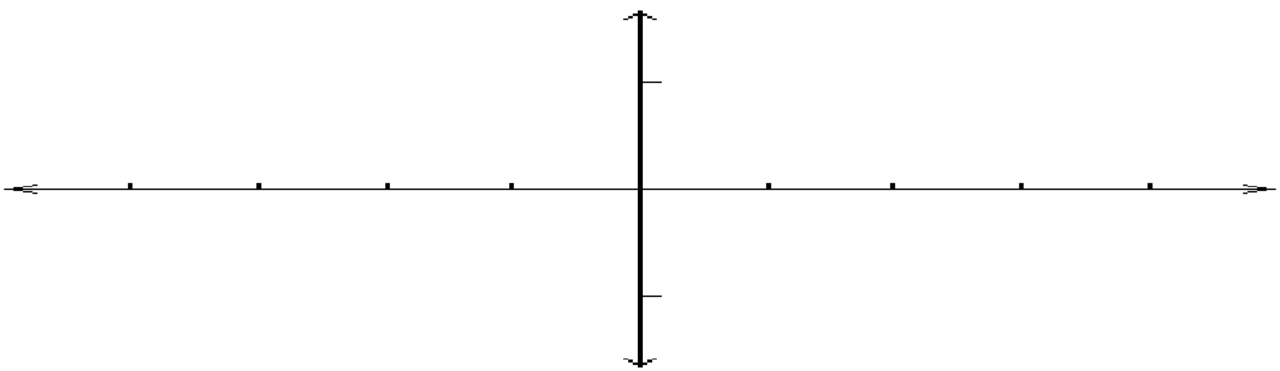
2. $y = 4\sin(\mathrm{x})$ Amplitude: ________ Midline: ________



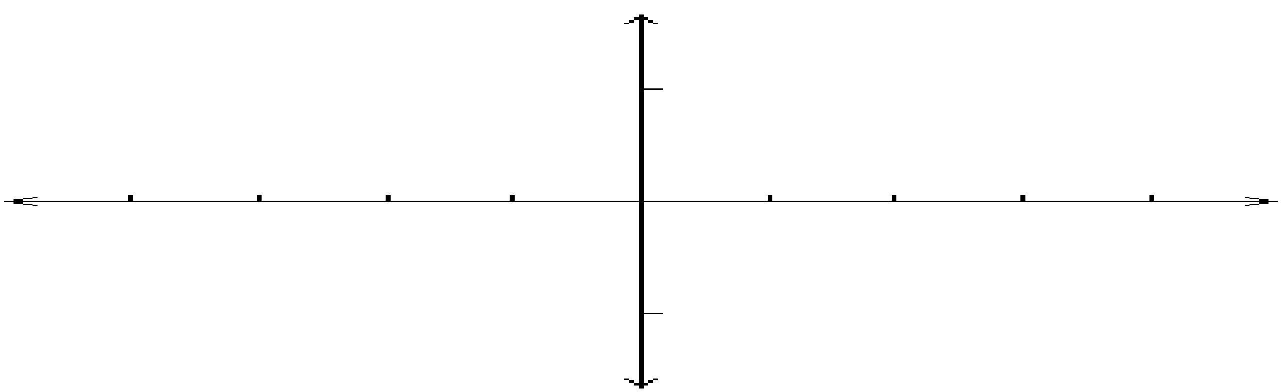
3. $y = -2\cos(x)$ Amplitude: _________ Midline: _________



4. $y = 0.5\sin(x)$ Amplitude: _________ Midline: _________



5. $y = 5\sin(x)$ +1 Amplitude: _________ Midline: _________



Review: Pythagorean Theorem

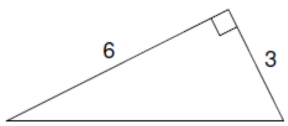
a. Pythagorean Theorem is used to find missing sides in a triangle.

b. "a" and "b" represent the ______________________________

c. "c" represents the __________________________

d. Examples: Find the missing sides using Pythagorean Theorem

i.



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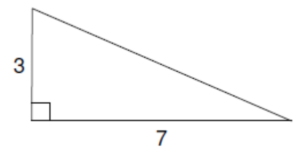
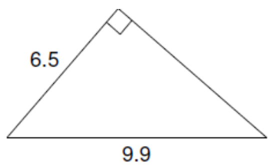


3.



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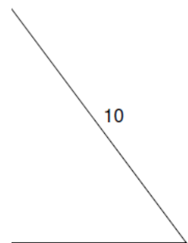
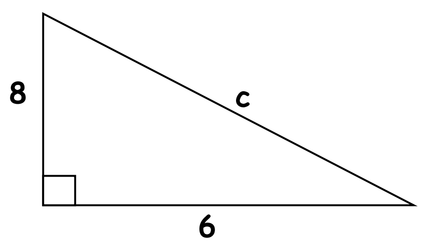
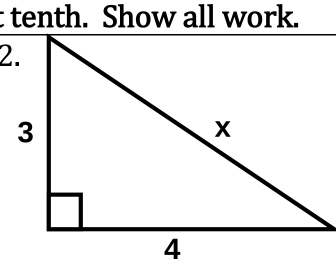
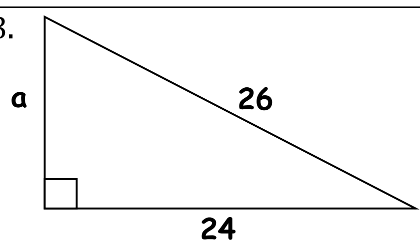
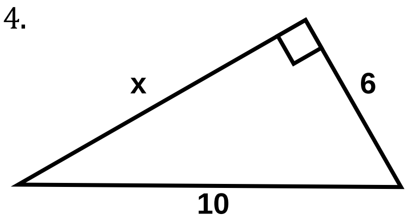


Practice

Solve for each variable. Round each answer to the nearest tenth. Show all work.

1. 	2. 
3. 	4. 

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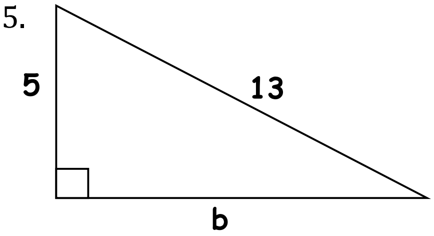

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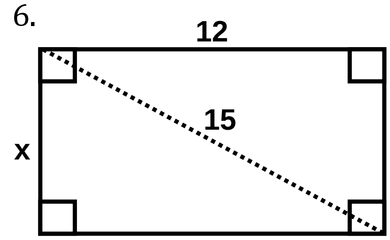

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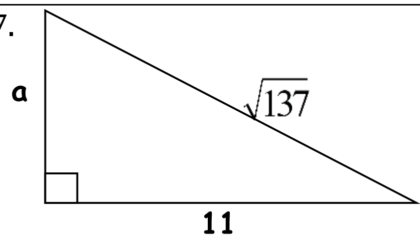

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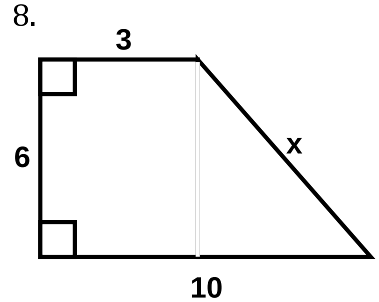

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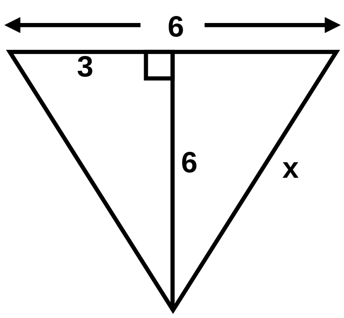


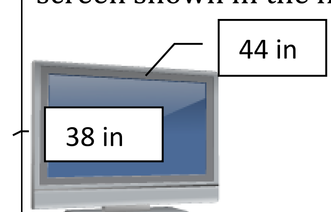
10. Find the length of the diagonal of a square whose side length is 10 inches

11. The length of one of the legs in a right triangle is 4 inches. If the hypotenuse is 12 inches long, what is the length of the other leg?

12. The diagonal crossbar of an old wooden gate has rusted. The gate is rectangular, 3 feet by 4 feet. How long is the crossbar (diagonal)?

13. Find the length of a diagonal of a square enclosure with a perimeter of 16 feet.

14. What is the diagonal measurement of the TV screen shown in the figure below?



Finding Missing Sides Using SOHCAHTOA

II. SOHCAHTOA

a. SOHCAHTOA is used to help find missing sides and angles in a right triangle when Pythagorean Theorem does not work!

S (sine) **O** (opposite) **H** (hypotenuse) →	
C (cosine) **A** (adjacent) **H** (hypotenuse) →	
T (tangent) **O** (opposite) **A** (adjacent) →	

b. Setting up Trigonometry Ratios and Solving for Sides

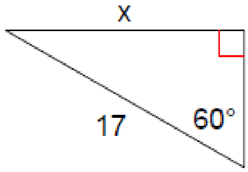
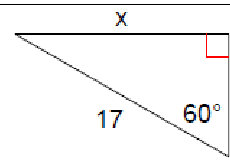
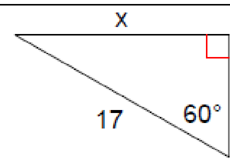
i. ______________________ (NOT the right angle)

ii. ______________________ (Opposite, Adjacent, Hypotenuse)

iii. ______________________:

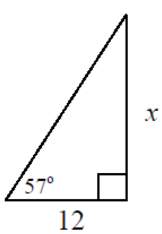
- ✓ _______ if we have the opposite and hypotenuse
- ✓ _______ if we have the adjacent and the hypotenuse
- ✓ _______ if we have the opposite and the adjacent

iv. Set up the proportion and solve for x!

Example: 	
1. Select a given angle	
2. Label your sides	
3. Decide which Trig to use	
4. Set up the proportion	
5. Solve the proportion	
6. Check your work!	

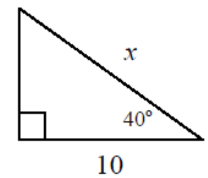
<u>Examples:</u> Find x in each of the triangles below. Round your final answers to the nearest hundredth. (*Figures may not be drawn to scale.*)

a)



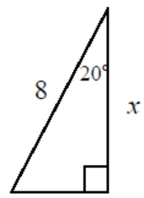
$x \approx$ ____________

b)



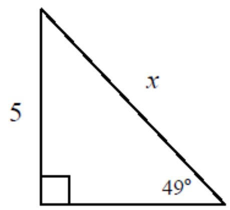
$x \approx$ ___________

c)



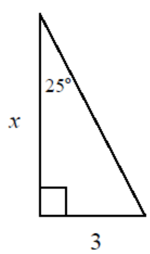
$x \approx$ ___________

d)



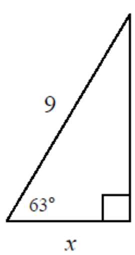
$x \approx$ ___________

e)



$x \approx$ ___________

f)



$x \approx$ ___________

SOHCAHTOA (find missing angles)

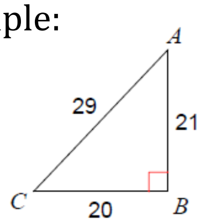
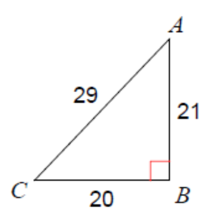
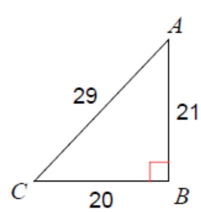
I. Review: SOHCAHTOA

SOH	CAH	TOA

II. Setting up Trigonometry Ratios and Solving for Angles

i. Select a given angle (NOT the right angle)
ii. Label your sides (Opposite, Adjacent, Hypotenuse)
iii. Decide which trig function you can use:
- ✓ SOH if we have the opposite and hypotenuse
- ✓ CAH if we have the adjacent and the hypotenuse
- ✓ TOA if we have the opposite and the adjacent

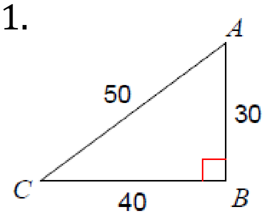
iv. Solve the equation … remember to you your inverses!

Example:  Find the measure of angle A.	
1. Select a given angle	
2. Label your sides	
3. Decide which Trig to use	

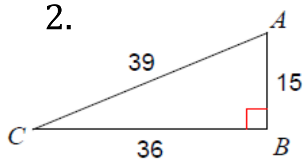
4. Set up the proportion	
5. Solve the equation	
6. Check your work!	

III. Find the measure of both missing angles:

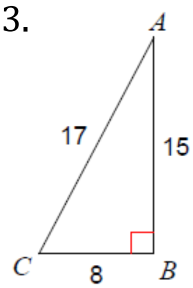
1.



2.



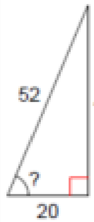
3.



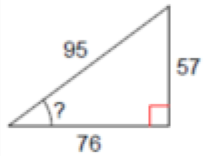
Missing Angles Practice

Find the measure of the missing angles in each of the triangles to solve the riddle below.

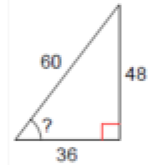
1.
s. 67°
t. 47°
u. 21°
v. 69°



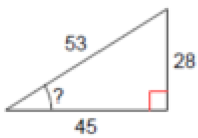
2.
e. 51°
f. 31°
g. 37°
h. 53°



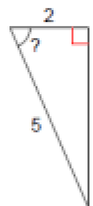
3.
r. 53°
s. 37°
t. 41°
u. 39°



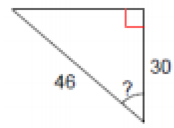
4.
j. 62°
k. 28°
l. 32°
m. 50°



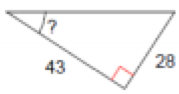
5.
a. 22°
b. 66°
c. 68°
d. 24°



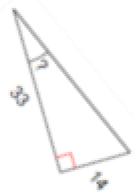
6.
m. 49°
n. 33°
o. 47°
p. 57°



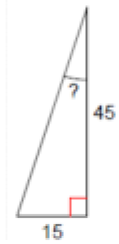
7.
s. 24°
t. 57°
u. 59°
v. 33°



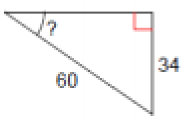
8.
q. 67°
r. 65°
s. 25°
t. 23°



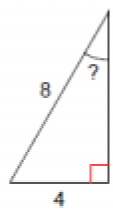
9.
n. 19°
o. 72°
p. 18°
q. 71°



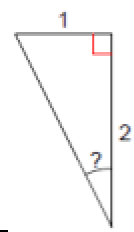
10.
f. 17°
g. 30°
h. 14°
i. 35°



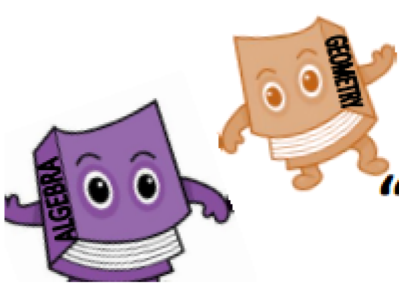
11.
n. 27°
o. 30°
p. 60°
q. 63°



12.
d. 60°
e. 27°
f. 63°
g. 30°



What did the math book say to the other math book?



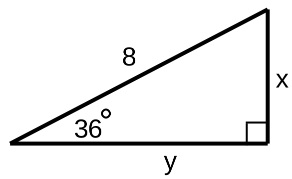
“ _ ‘ _ _ _ _ _ _ _ _ _ _ _ _ _ !”

10 7 12 2 11 8 9 3 11 5 4 12 6 1

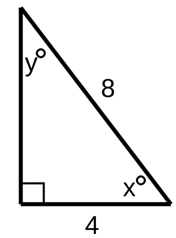
SOHCAHTOA Sides and Angles Practice

For each of the following, write the equation to find the missing value. Then rewrite the equation that you will enter in your calculator. Round your final answer to the nearest tenth.

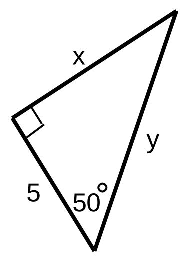
1.
x ≈ ________
y ≈ ________



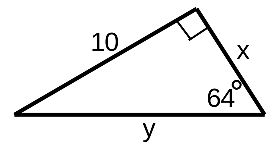
2.
x ≈ ________
y ≈ ________



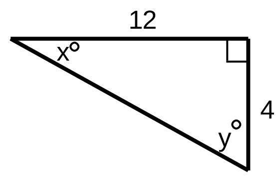
3.
x ≈ ________
y ≈ ________



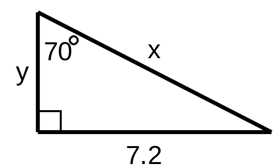
4.
x ≈ ________
y ≈ ________



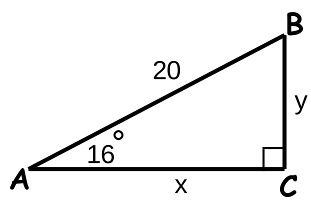
5.
x ≈ ________
y ≈ ________



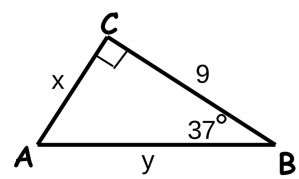
6.
x ≈ ________
y ≈ ________



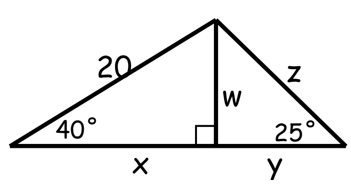
7.
x ≈ ________
y ≈ ________
m∠B= _______



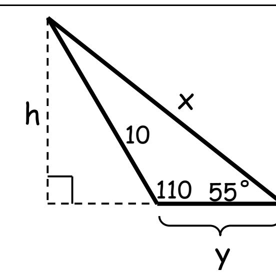
8.
x ≈ ________
y ≈ ________
m∠A= ________



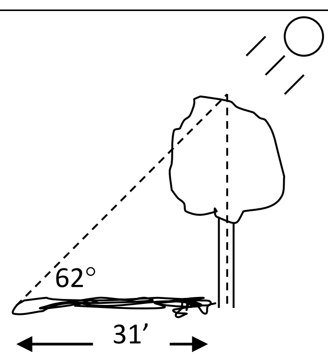
9.
w ≈ ________
x ≈ ________
y ≈ ________
z ≈ ________



10.
h ≈ ________
x ≈ ________
y ≈ ________



11. How tall is the tree?



12. A man who is 6 feet tall is flying a kite. The kite string is 75 feet long. If the angle that the kite string makes with the line horizontal to the ground is 35°, how far above the ground is the kite?

13. A ladder 14 feet long rests against the side of a building. The base of the ladder rests on level ground 2 feet from the side of the building. What angle does the ladder form with the ground?

14. A 24-foot ladder leaning against a building forms an 18° angle with the side of the building. How far is the base of the ladder from the base of the building?

15. A road rises 10 feet for every 400 feet along the pavement (not the horizontal). What is the measurement of the angle the road forms with the horizontal?

16. A 32-foot ladder leaning against a building touches the side of the building 26 feet above the ground. What is the measurement of the angle formed by the ladder and the ground?

17. The directions for the use of a ladder recommend that for maximum safety, the ladder should be placed against a wall at a 75° angle with the ground. If the ladder is 14 feet long, how far from the wall should the base of the ladder be placed?

18. A kite is held by a taut string pegged to the ground. The string is 40 feet long and makes a 33° angle with the ground. Supposing that the ground is level, find the vertical distance from the ground to the kite.

19. A wire anchored to the ground braces a 17-foot pole. The wire is 20 feet long and is attached to the pole 2 feet from the top of the pole. What angle does the wire make with the ground?

20. A jet airplane begins a steady climb of 15° and flies for two ground miles. What was its change in altitude?

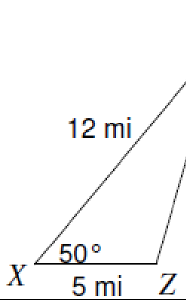
Area of a Triangle using Sine

I. Area of a Triangle using Sine

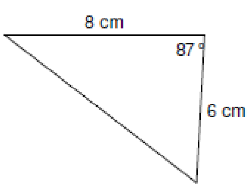
a. Area of a triangle can be found using the following formula:

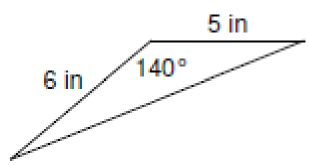
b. Unfortunately, we are not always given the base and height!

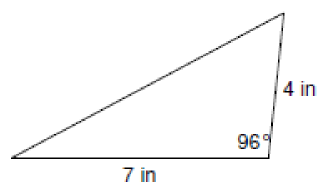
c. To find the height, we create a right triangle and use SOHCAHTOA!

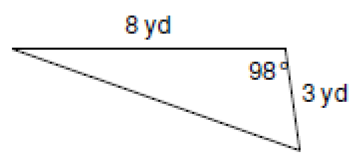
Example: Find the area of the triangle	
	

Practice: Find the area of the following triangles

1. 

2. 

3. 

4. 

Area of a Triangle Practice

1. In ΔABC, $b = 2$, $c = 4$, and m< $A = 30$. Find the area.

2. In ΔABC, $b = 4$, $c = 6$, and m< $A = 75$. Find the area.

3. In ΔABC, side a is twice as long as side b and m<$C = 30$. In terms of b. Find the area.

4. If m<$B = 60$, $a = 6$, and $c = 10$, what is the area of ΔABC?

5. In *ABC*, $a = 8$, $b = 9$, and m<$C = 135$. What is the area of ΔABC?

6. In ΔABC, m<$C = 30$ and $a = 8$. If the area of the triangle is 12, what is the length of side b?

7. The sides of a triangle measure 6 and 8, and the measure of the included angle is 150º. Find the area.

8. If the vertex angle of an isosceles triangle measures 30º and each leg measures 4, find the area of the triangle.

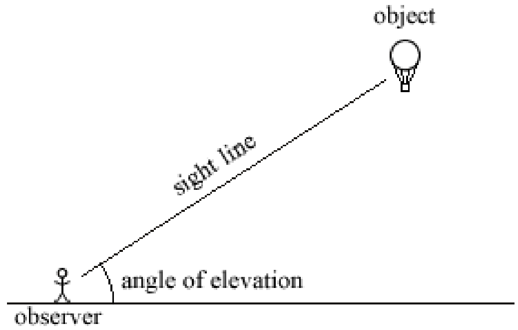
9. The vertex angle of isosceles triangle ABC measures 30º, and each leg has length 20. What is the area of ABC?

10. Jack is planting a triangular rose garden. The lengths of two sides of the plot are 8 feet and 12 feet, and the angle between them is 87°. Write an expression that could be used to find the area of this garden?

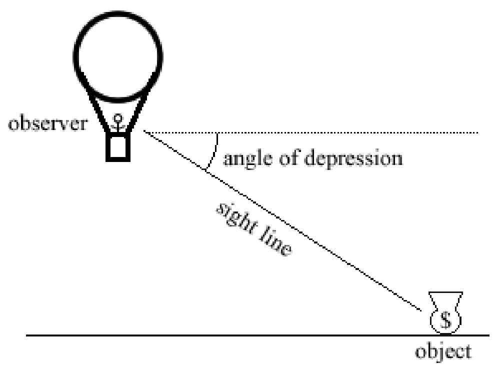
Angles of Elevation and Depression

I. Angles of Elevation and Depression

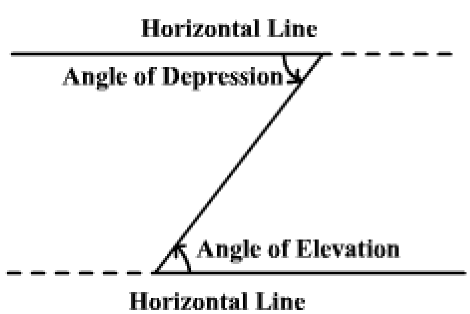
a. The angle of elevation is the angle formed by a _______________ and the line of sight ___________________.



b. The angle of depression is the angle formed by a _____________ and the line of sight __________________.



c. Notice … the angle of elevation and the angle of depression are __________________________ when in the same picture!



Angle of Elevation/Depression Application Problems

Angle of Elevation	Angle of Depression

1. A tree casts a 5m shadow. Find the height of the tree if the angle of elevation of the sun is 32.3º.

Sketch: **Work:** **Answer:**

2. A ladder 10.4 m long leans against a building that is 1.5 meters away. What is the angle formed by the ladder and the building?

Sketch: **Work:** **Answer:**

3. A ladder 8.6 m long makes an angle of 68º with the ground as it leans against a building. How far is the foot of the ladder from the foot of the building?

Sketch: **Work:** **Answer:**

4. The angle of depression from the top of a cliff 800 meters high to the base of a log cabin is 37º. How far is the cabin from the foot of the cliff?

Sketch: **Work:** **Answer:**

6. From a point on the ground 500 ft from the base of a building, it is observed that the angle of elevation to the top of the building is 24º and the angle of elevation to the top of a flagpole atop the building is 27º. Find the height of the building and the length of the flagpole.

Sketch: **Work:** **Answer:**

5. Mrs. Roberts stands 25ft from the flagpole. She looks and the angle of elevation to the top of the flagpole is 45 degrees. Find the height of the flagpole.

Sketch: **Work:** **Answer:**

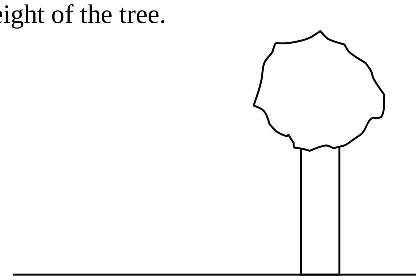
Angles of Elevation & Depression Practice

Draw a picture, write a trig ratio equation, rewrite the equation so that it is calculator ready and then solve each problem. Round measures of segments to the nearest tenth and measures of angles to the nearest degree.

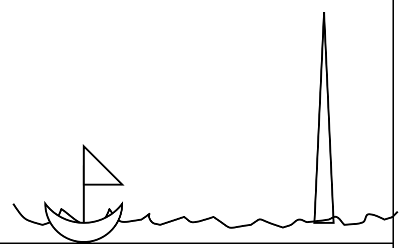
________1. A 20-foot ladder leans against a wall so that the base of the ladder is 8 feet from the base of the building. What is the ladder's angle of elevation?

________2. A 50-meter vertical tower is braced with a cable secured at the top of the tower and tied 30 meters from the base. What is the angle of depression from the top of the tower to the point on the ground where the cable is tied?

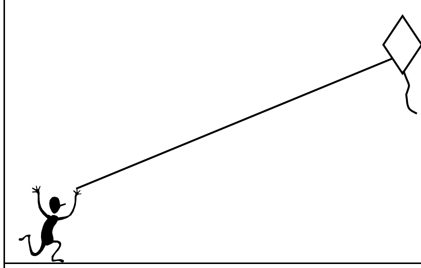
________3. At a point on the ground 50 feet from the foot of a tree, the angle of elevation to the top of the tree is 53°. Find the height of the tree.



________4. From the top of a lighthouse 210 feet high, the angle of depression of a boat is 27°. Find the distance from the boat to the foot of the lighthouse. The lighthouse was built at sea level.

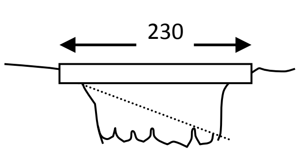


________5. Richard is flying a kite. The kite string has an angle of elevation of 57°. If Richard is standing 100 feet from the point on the ground directly below the kite, find the length of the kite string.



________6. An airplane rises vertically 1000 feet over a horizontal distance of 5280 feet. What is the angle of elevation of the airplane's path?

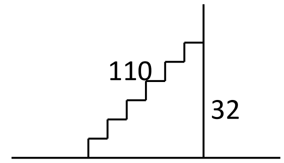
________7. A person at one end of a 230-foot bridge spots the river's edge directly below the opposite end of the bridge and finds the angle of depression to be 57°. How far below the bridge is the river?



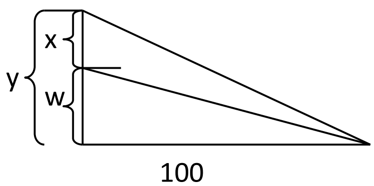
________8. The angle of elevation from a car to a tower is 32°. The tower is 150 ft. tall. How far is the car from the tower?

________9. A radio tower 200 ft. high casts a shadow 75 ft. long. What is the angle of elevation of the sun?

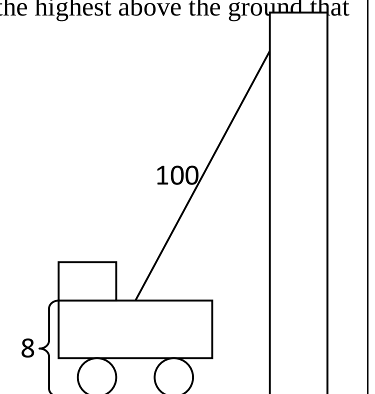
________10. An escalator from the ground floor to the second floor of a department store is 110 ft long and rises 32 ft. vertically. What is the escalator's angle of elevation?



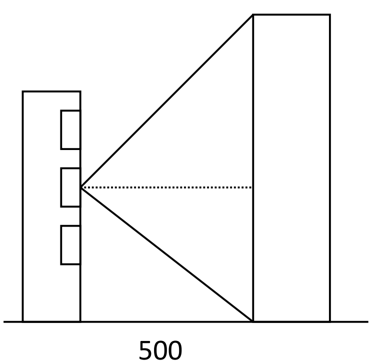
________11. A rescue team 1000 ft. away from the base of a vertical cliff measures the angle of elevation to the top of the cliff to be 70°. A climber is stranded on a ledge. The angle of elevation from the rescue team to the ledge is 55°. How far is the stranded climber from the top of the cliff? (Hint: Find y and w using trig ratios. Then subtract w from y to find x)



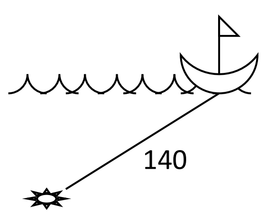
________12. A ladder on a fire truck has its base 8 ft. above the ground. The maximum length of the ladder is 100 ft. If the ladder's greatest angle of elevation possible is 70°, what is the highest above the ground that it can reach?



________13. A person in an apartment building sights the top and bottom of an office building 500 ft. away. The angle of elevation for the top of the office building is 23° and the angle of depression for the base of the building is 50°. How tall is the office building?



________14. Electronic instruments on a treasure-hunting ship detect a large object on the sea floor. The angle of depression is 29°, and the instruments indicate that the direct-line distance between the ship and the object is about 1400 ft. About how far below the surface of the water is the object, and how far must the ship travel to be directly over it?



Law of Cosines

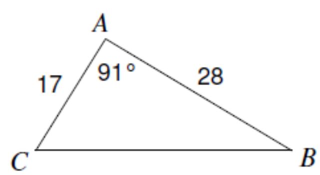
I. Law of Cosines

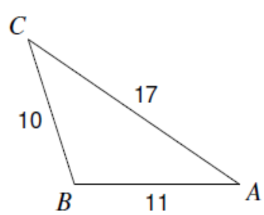
a. Law of Cosines is used to find missing sides and angles in oblique triangles

b. Law of Cosines can be used in the following cases:

1. Side-Side-Side
2. Side-Angle-Side

c. Examples: Find the missing sides and angles:

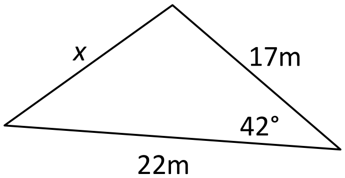
1. 

2. 

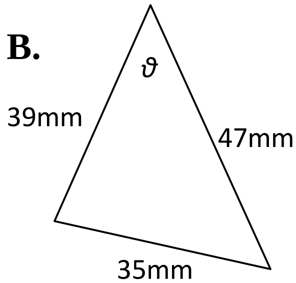
<u>Law of Cosines Practice</u>

Solve for the unknown in each triangle. Round to the nearest hundredth.

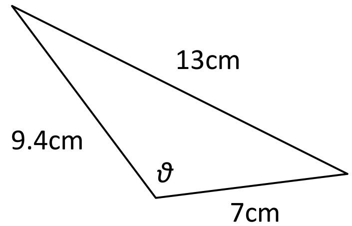
A.



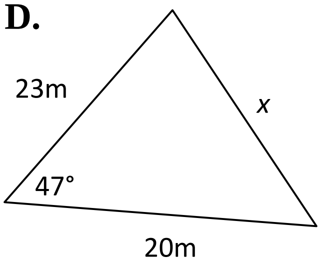
B.



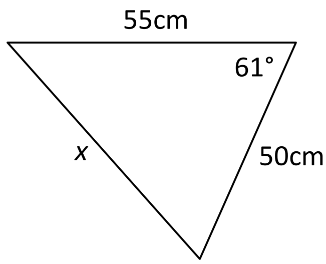
C.



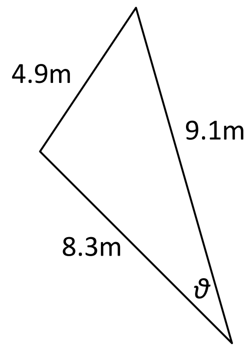
D.



E.



F.



2. Solve for **<u>all</u>** missing sides and angles in each triangle. Round to the nearest hundredth. ** USE PROPER VARIABLES

A. $\Delta XYZ: \quad x = 29m, y = 15m, \angle Z = 122°$

B. $\Delta GHI: \quad g = 13cm, h = 8cm, i = 15cm$

C. $\Delta MNO: \quad n = 31m, o = 28m, \angle M = 62°$

3. A triangle has sides equal to 4 m, 11 m and 8 m. Find its angles (round answers to nearest tenth)

4. A ship leaves port at 1 pm traveling north at the speed of 30 miles/hour. At 3 pm, the ship adjusts its course on a bearing of N 20º E. How far is the ship from the port at 4pm? (round to the nearest unit).

5. Find the area of the triangle whose sides are 12cm., 5cm. and 13cm.

Law of Sines

I. Law of Sines

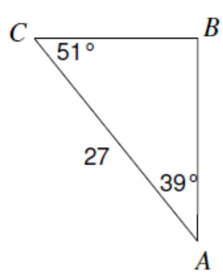
a. Law of Sines is used to find missing sides and angles in oblique triangles

b. Law of Sines can be used in the following cases:

1. Angle-Angle-Side
2. Angle-Side-Angle

c. Examples: Find the missing sides and angles.

1.



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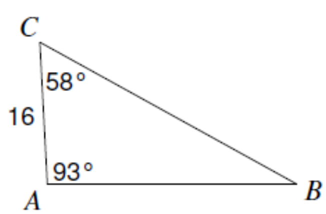
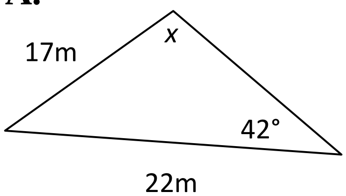


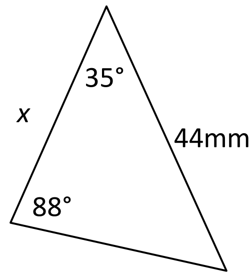
Law of Sines Practice

Solve for the unknown in each triangle. Round to the nearest tenth.

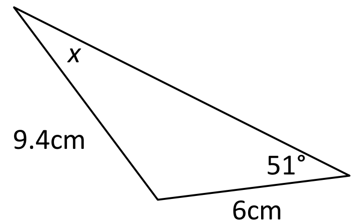
A.



B.



C.



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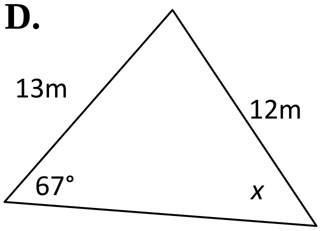

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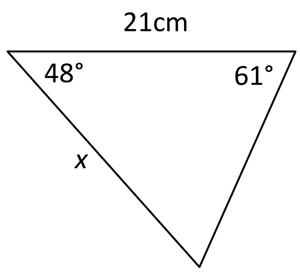

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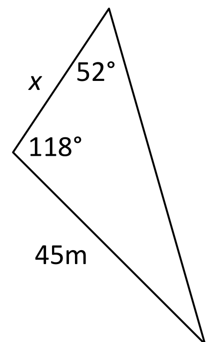
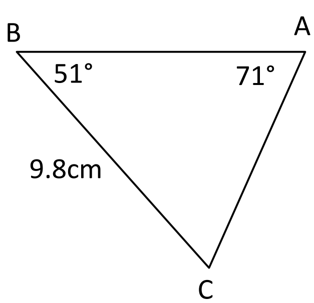
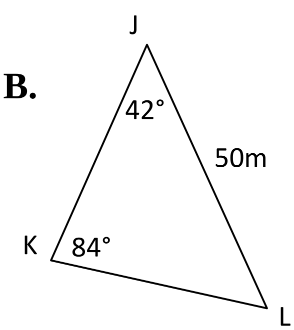


2. Solve for **all** missing sides and angles in each triangle. Round to the nearest tenth.

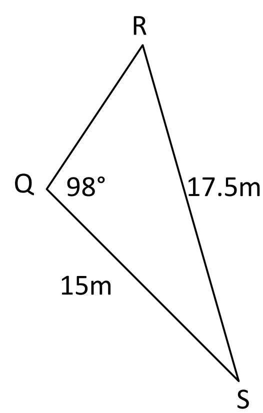
A.



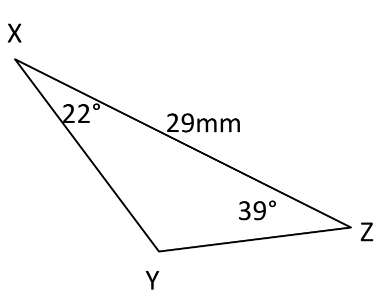
B.



C.



D.



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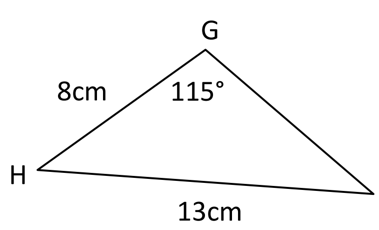
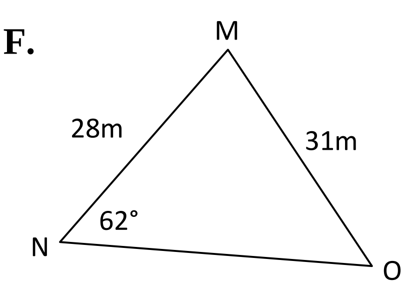
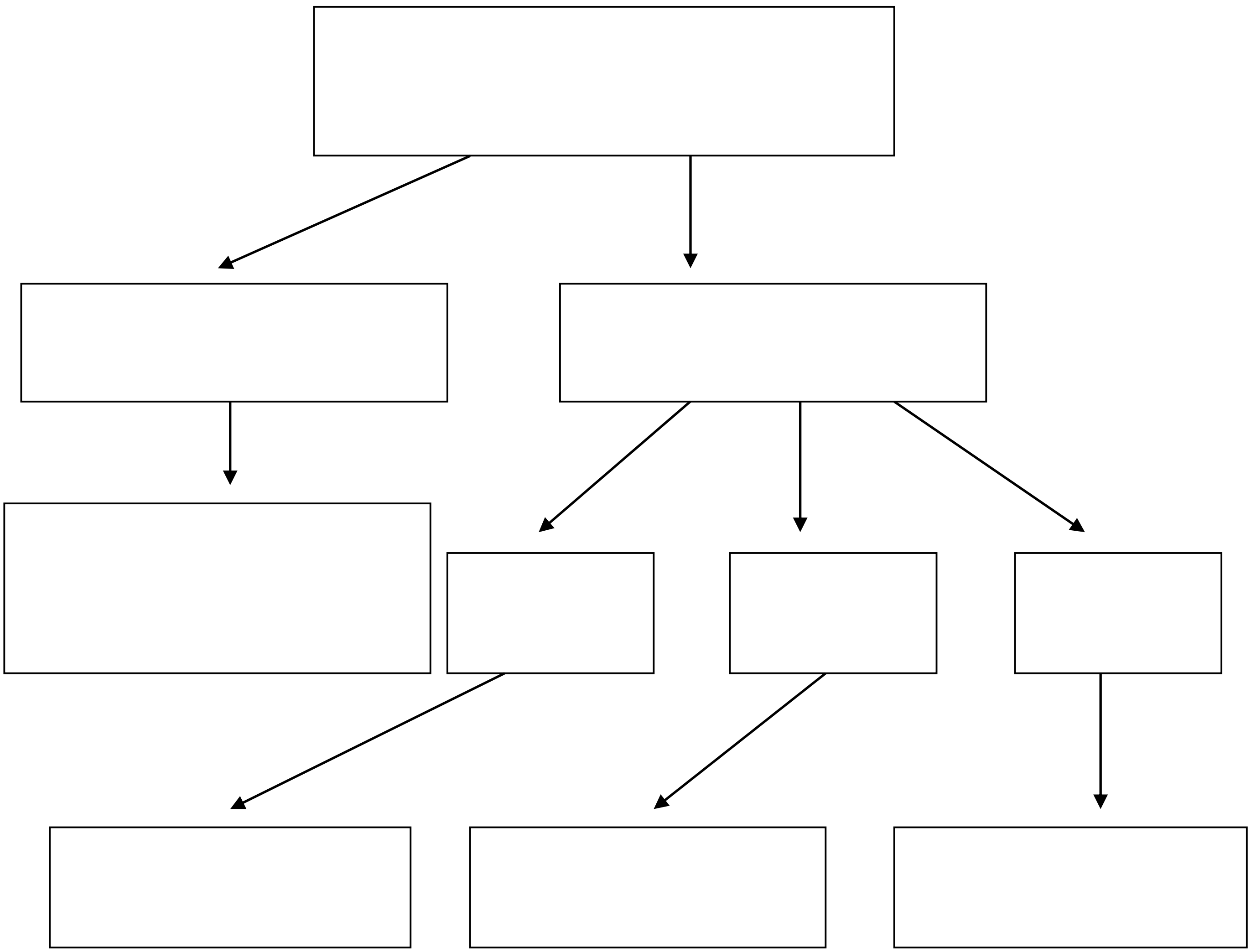


F.



Which Formula Do I Use?



Formulas:

SOH-CAH-TOA-

Pythagorean Theorem-

Law of Sines -

Law of Cosines –