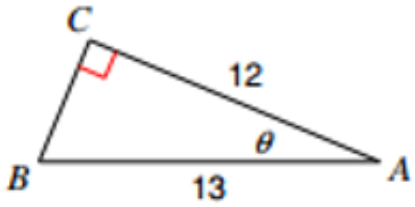
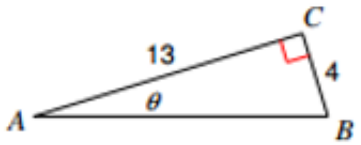
Day 8 Warm-Up

Solve for the variable:

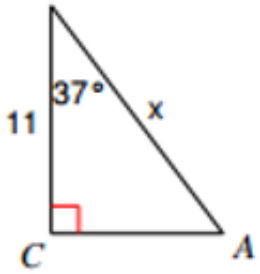
1)



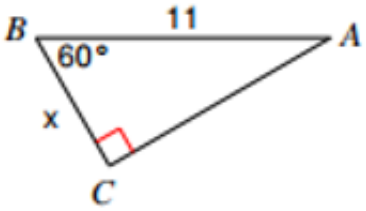
2)



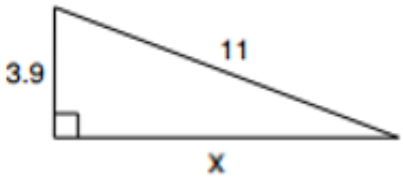
3)



4)



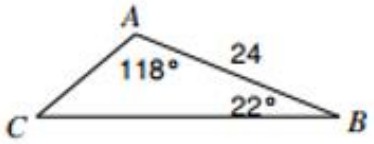
5)



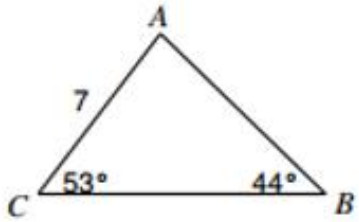
Day 9 Warm-Up

Find each measurement indicated. Round your answers to the nearest tenth.

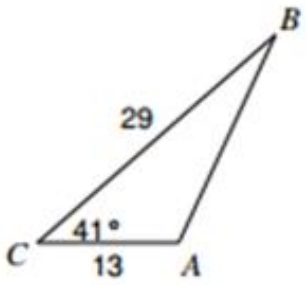
1) Find AC



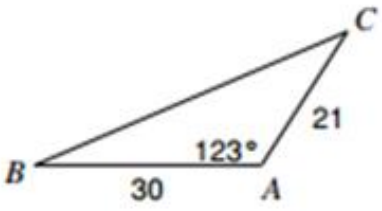
2) Find AB



3) Find AB



4) Find BC

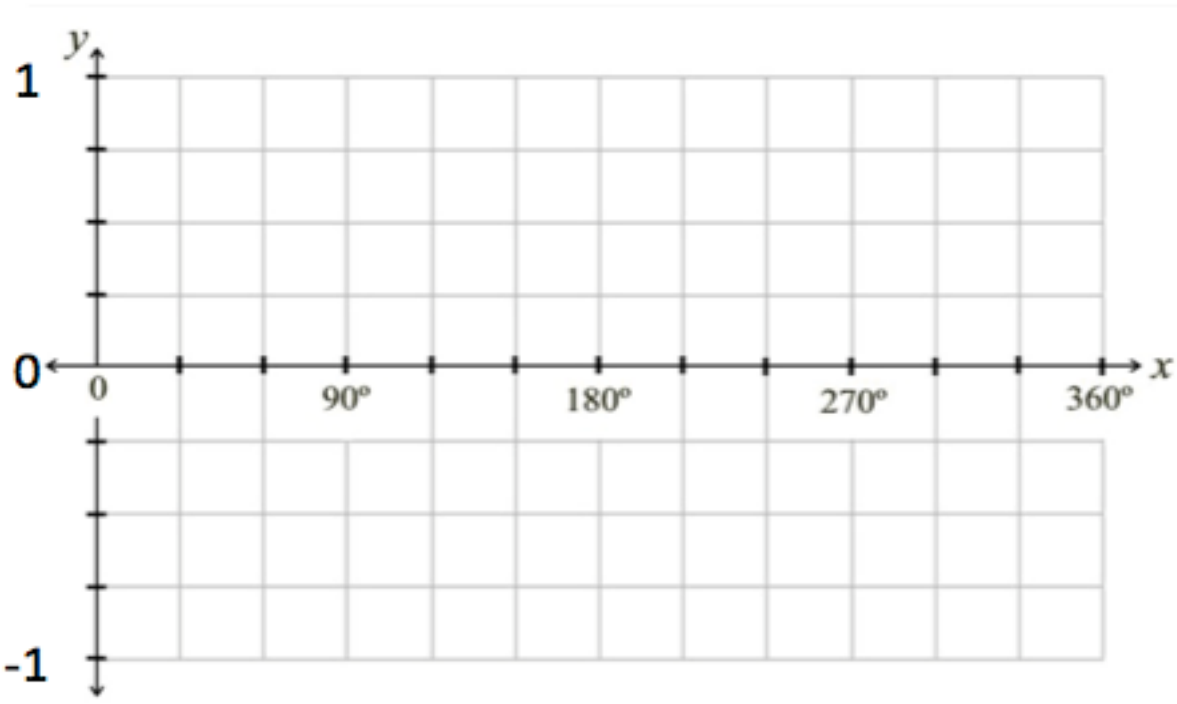


Day 8/9: Exploring Sine, Cosine, and Tangent Graphs

Complete the table below: **Make sure your calculator is in degree mode!!**

Degree	sin(x)	Point (Degree, sin(x))
0	0	(0,0)
30		
60		
90		
120		
150		
180		
210		
240		
270		
300		
330		
360		

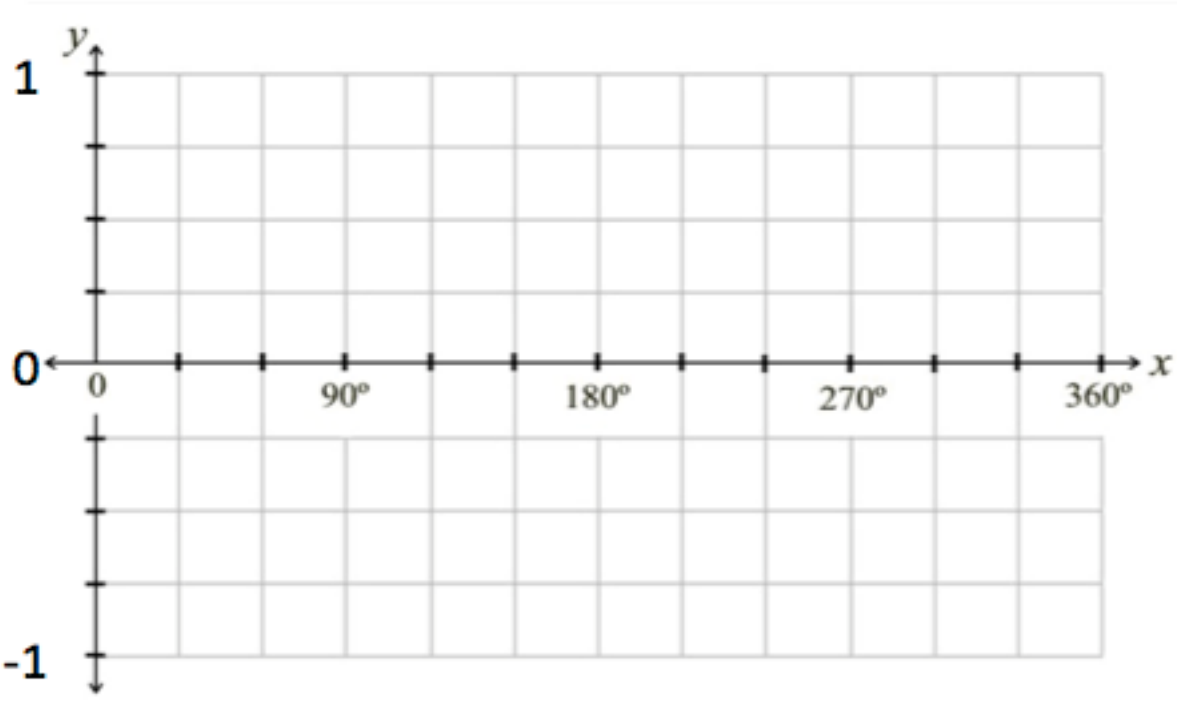
Using the points above (degree, sin(x)), sketch a graph of y = sin(x).



Complete the table below:

Degree	Cos(x)	Point (Degree, Cos(x))
0	1	(0,1)
30		
60		
90		
120		
150		
180		
210		
240		
270		
300		
330		
360		

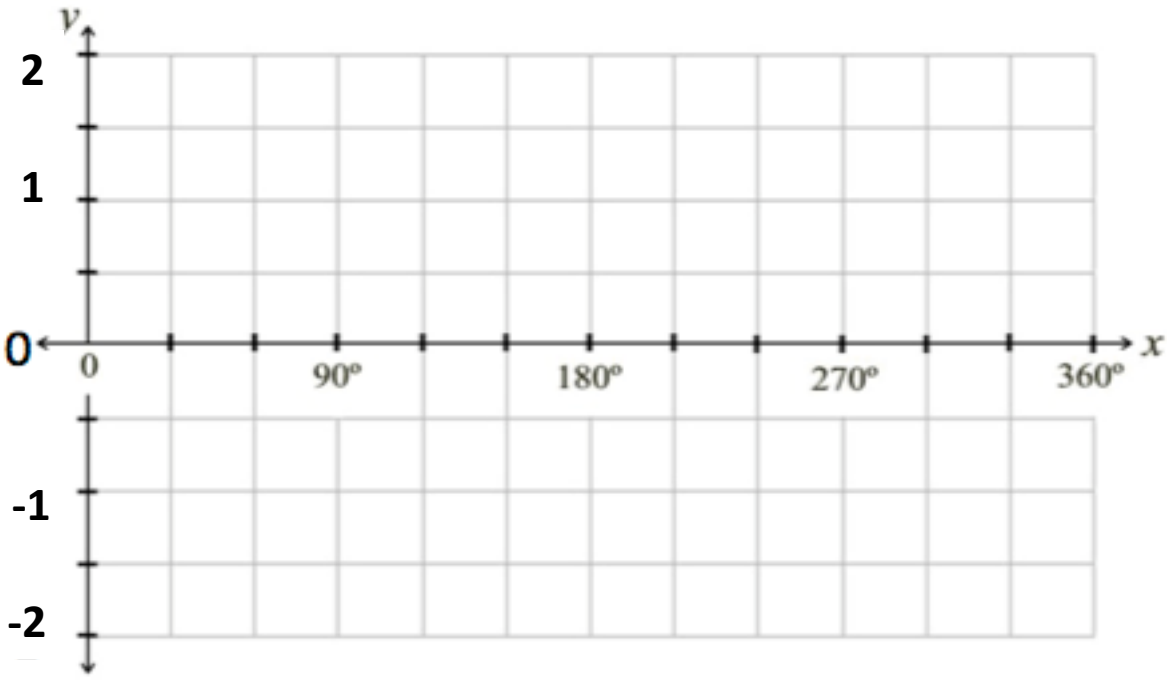
Using the points above (degree, cosx), sketch a graph of y = cos(x).



Complete the table below:

Degree	Tan(x)	Point (Degree, Tan(x))
0	0	(0,0)
30		
60		
90		
120		
150		
180		
210		
240		
270		
300		
330		
360		

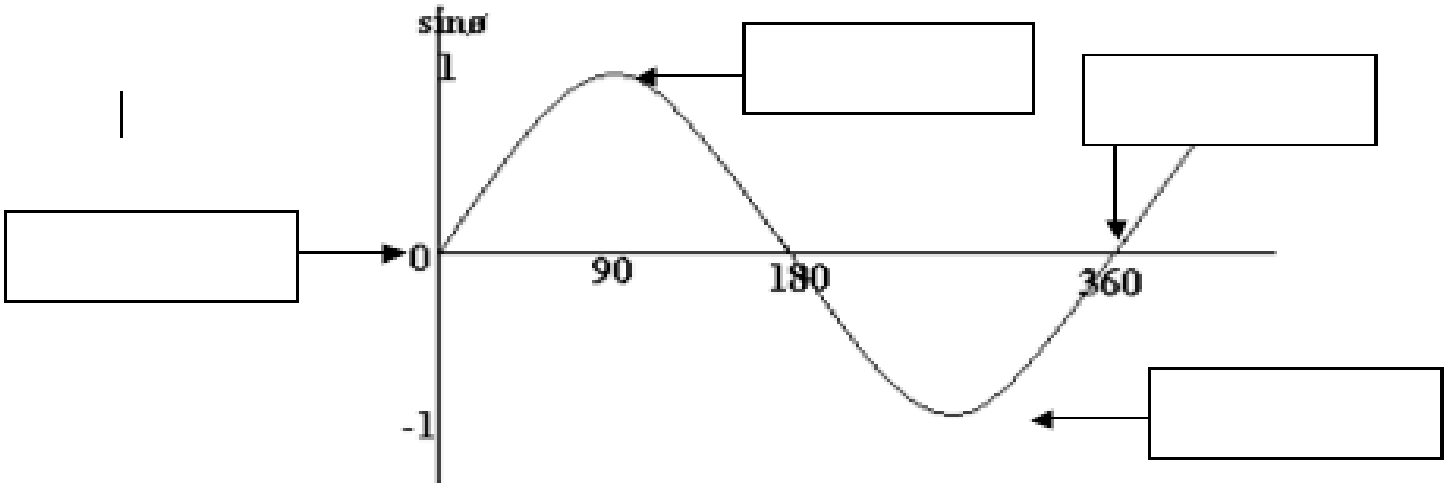
Using the points above (degree, tanx), sketch a graph of y = tanx.



What happens to tangent at 90° and 270°? Why is this happening?

Day 9 Notes Part 1: The Graphs of Sine, Cosine, and Tangent

I. Sine Graph



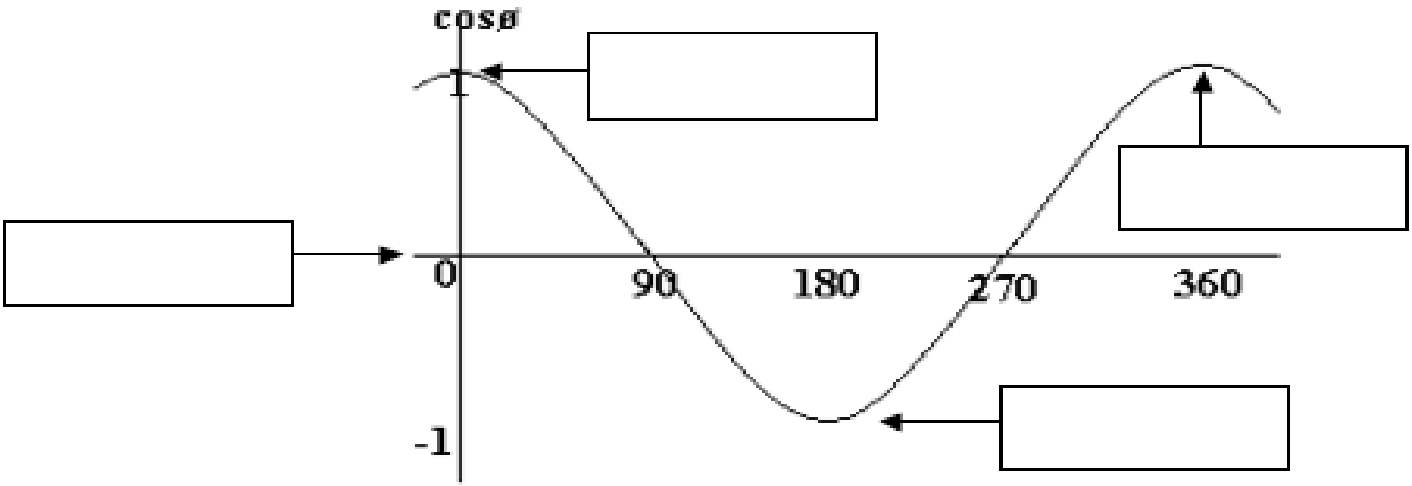
a. Sine is increasing:

b. Sine is decreasing:

c. Sine is positive:

d. Sine is negative:

II. Cosine Graph



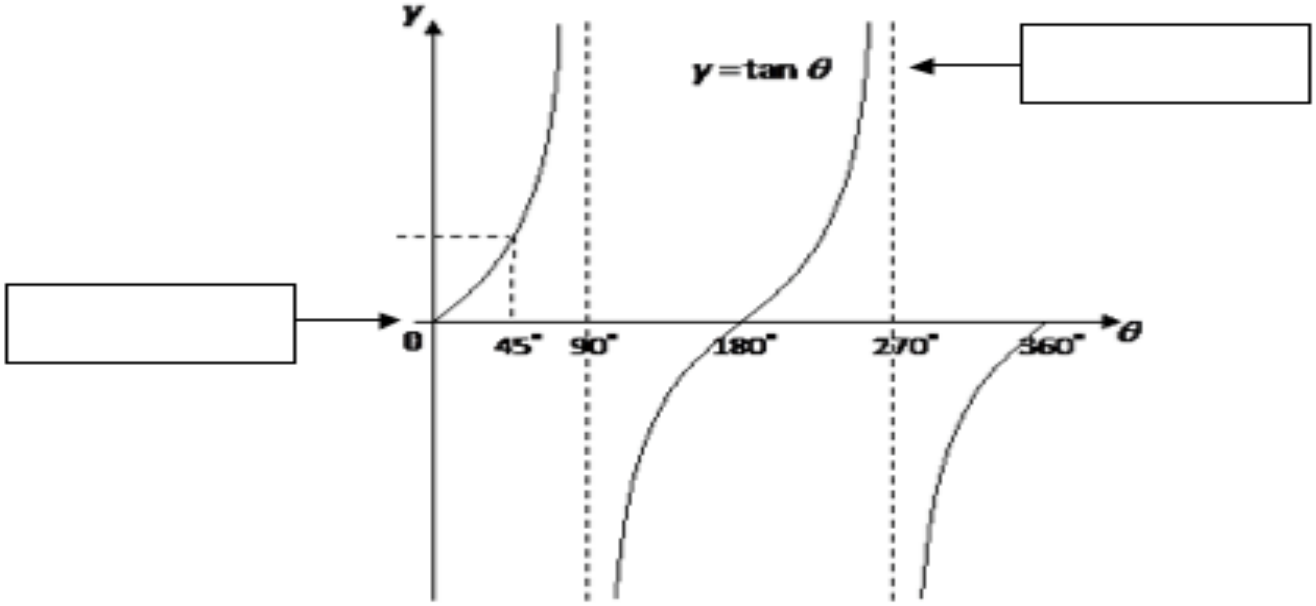
a. Cosine is increasing:

b. Cosine is decreasing:

c. Cosine is positive:

d. Cosine is negative:

III. Tangent Graph



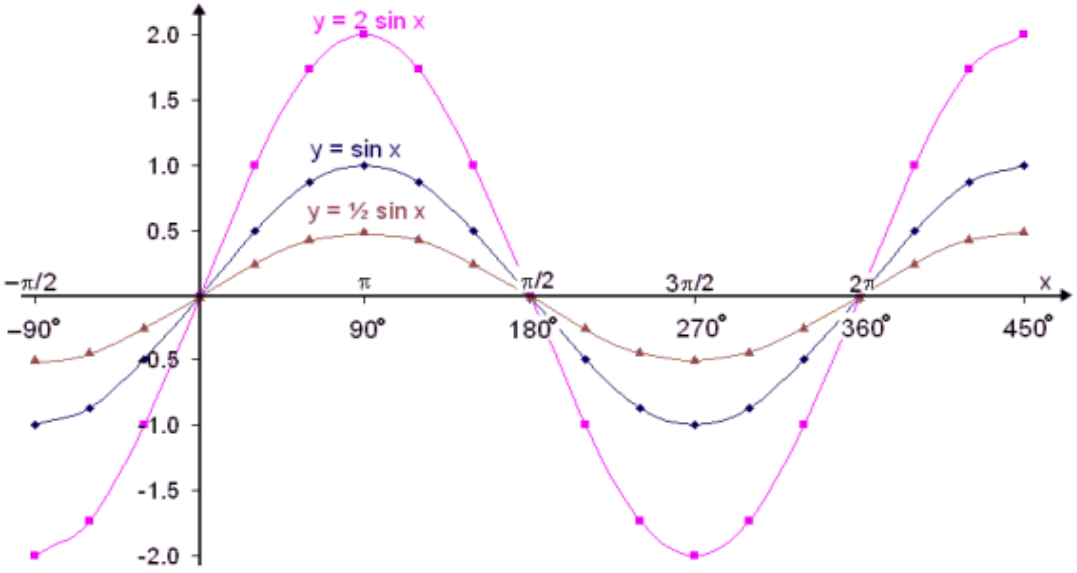
a. Tangent is increasing:

b. Tangent is decreasing:

c. Tangent is positive:

d. Tangent is negative:

Day 9 Notes Part 2: Amplitudes and Midlines of Trig Functions



How are y = sin(x), y = 2sin(x), and y = $\frac{1}{2}$ sin(x) alike? How are they different?

I. Amplitude

a. Amplitude is the _____ of the graph from the _____.

b. A graph in the form _____ or _____ has an amplitude of _____.

c. The amplitude of a standard _____ or _____ graph is _____.

d. The amplitude of a sine or cosine graph can be found using the following formula:

e. Find the amplitude for each of the following:

1. $y = 3\sin x$ 2. $y = -4\cos 5x$ 3. $y = (1/3)\sin x + 5$

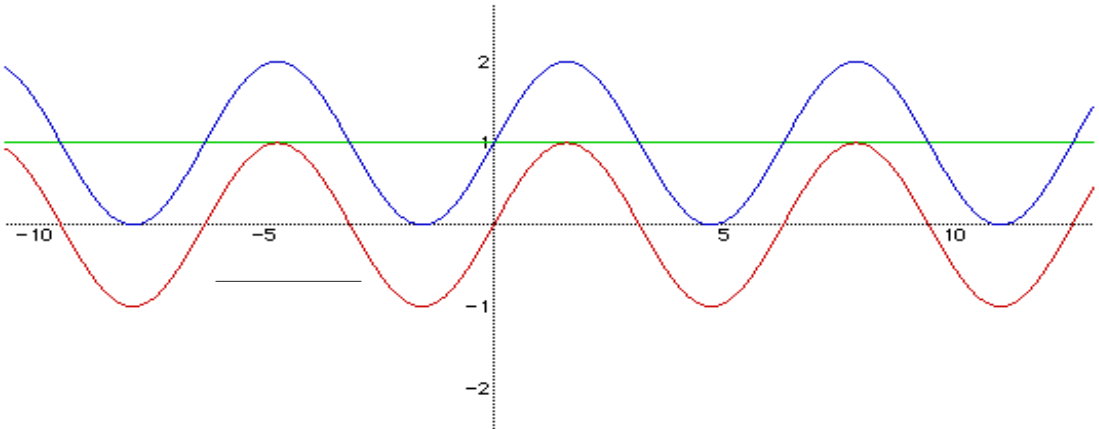
II. Midline

a. The midline is the line that _____

b. The midline is halfway between the _____ and _____

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

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



III. Period

a. A period is the length of one _____.

b. y=sin(x) has a period of _____.

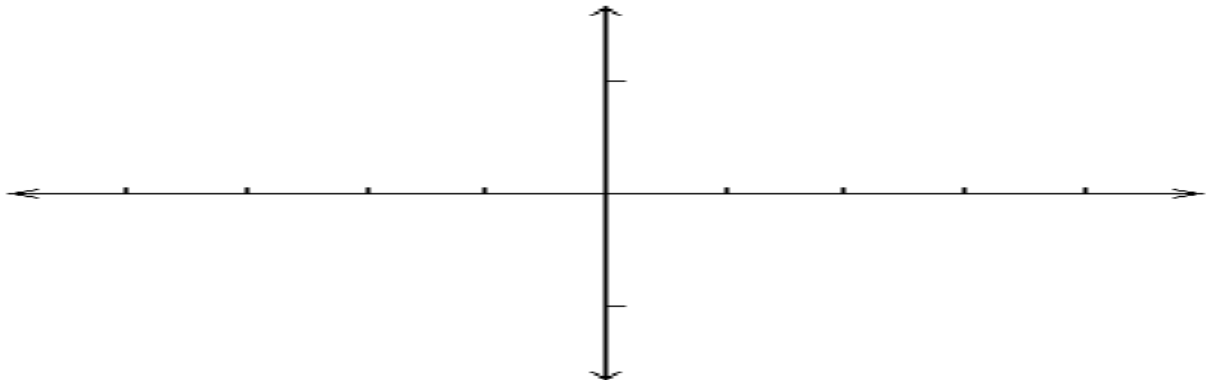
c. y=cos(x) has a period of _____.

d. y=tan(x) has a period of _____.

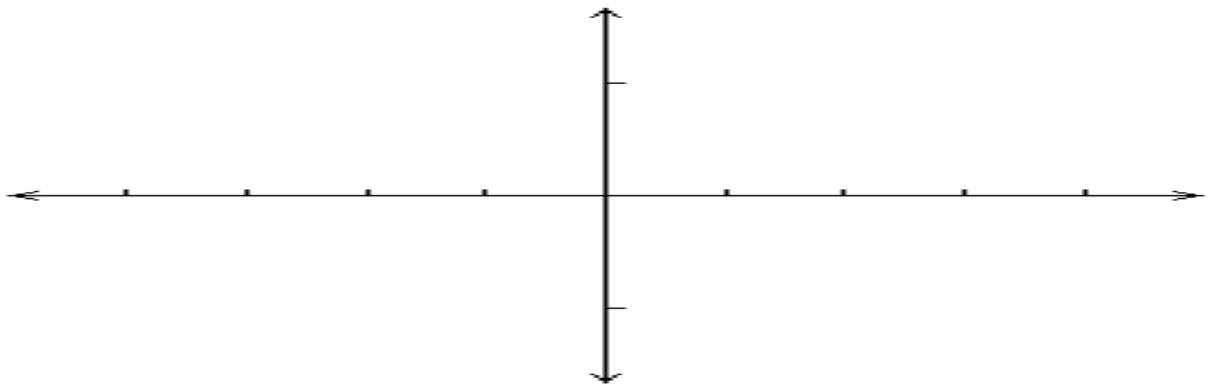
e. When f(x) = Asin(Bx) the formula for period is:

For each function, graph 1 period in the positive direction and 1 period in the negative direction.

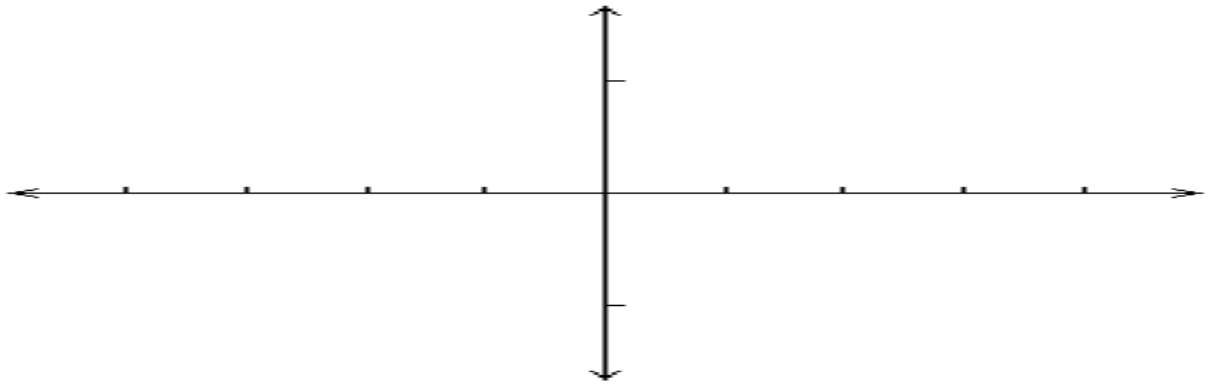
4. y = 0.5 sin (x) Amplitude: _____ Midline: _____ Period: _____



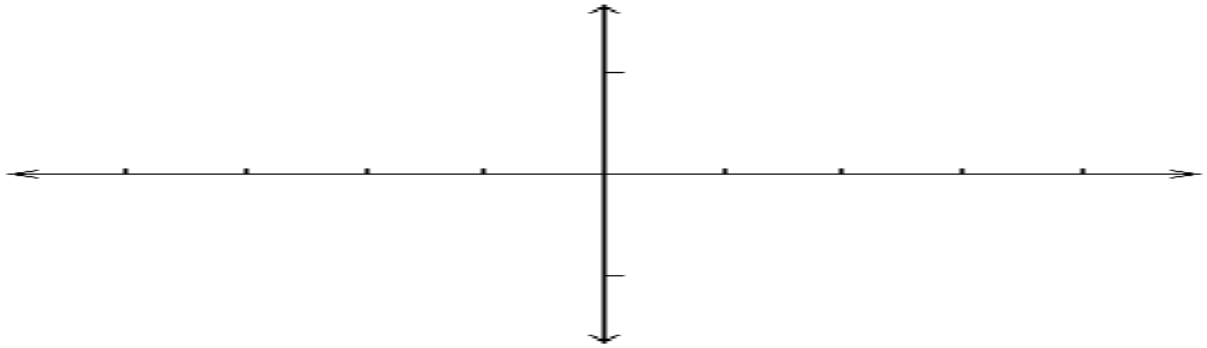
5. y = 5 sin (x) + 1 Amplitude: _____ Midline: _____ Period: _____



6. y = -2 sin (3x) Amplitude: _____ Midline: _____ Period: _____

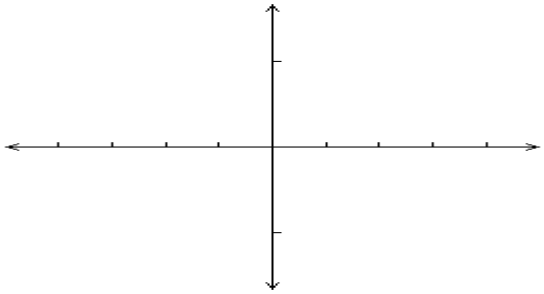


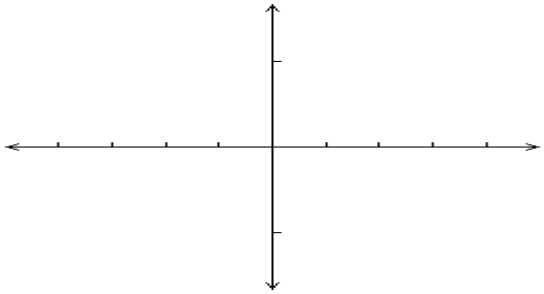
7. y = cos (2x) + 1 Amplitude: _____ Midline: _____ Period: _____



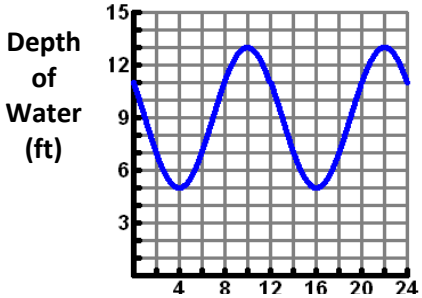
Day 10 Warm-Up

1. Find the amplitude, period and midline. Then, graph each Trig Function with 1 cycle in the negative direction and 1 cycle in the positive direction.
   a. y = -4 sin(3x)
   b. y = cos (2x) + 1



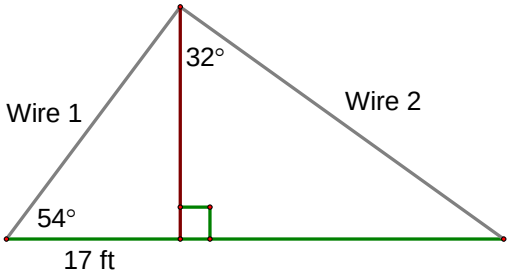


2. The graph shown displays the level of water at a boat dock, which varies due to the tides. Determine the amplitude, midline, and period of the graph.



continued on next page

4. In the figure shown, a pole has two wires attached to it, one on each side, forming two right triangles. How far from the base of the pole does Wire 2 attach to the ground?



Day 10 Notes Part 1: Interpreting Graphs of Trig Functions

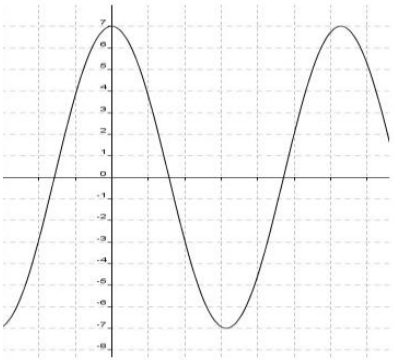
I. Amplitude and Midline

a. The amplitude can be found by using the formula:

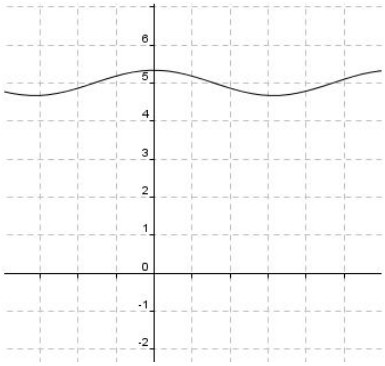
b. The midline can be found using the formula:

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

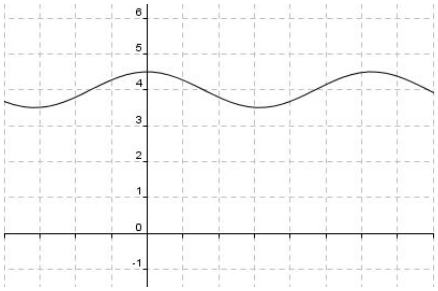
1.



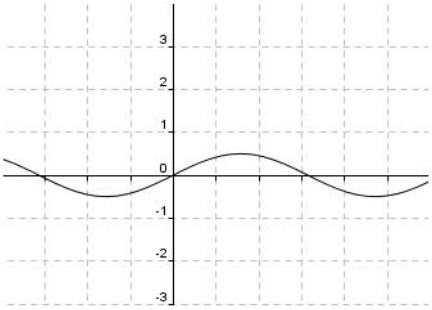
2.



3.

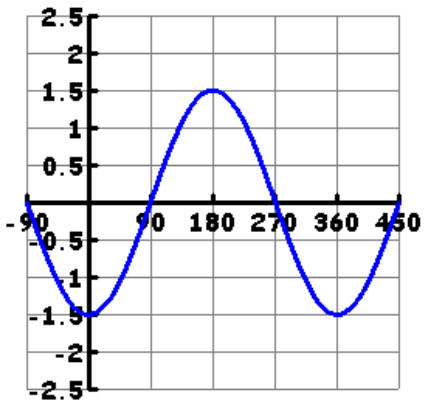


4.



Day 10 Part 1 Practice

1. Identify the amplitude, period, and midline of the following trig function.
   Hint: it may help to trace out one cycle.



State the amplitude, period, and midline of each of the following:

1. y = (1/2)sin (x)
2. y = -5cos (3x)
3. y = sin(x +5) - 6
4. y = 2cos (x) + 3

Day 10 Part 2 Notes: Writing Equations of Trig Functions when Given a Graph

Notes: Writing an equation given a trig graph

To write an equation of a trigonometric function when given a graph, first determine

_____, _____, and _____ of the graph.

**HINT: tracing one cycle of the graph can help determine these values AND decide if sine or cosine is better.

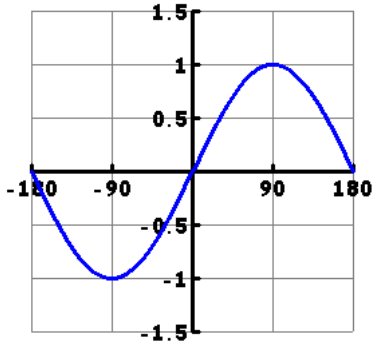
Then use those values and the formulas to calculate a, b, and d of the standard equation y = a sin(bx) + d or y = a cos(bx) + d.

Formulas we must know

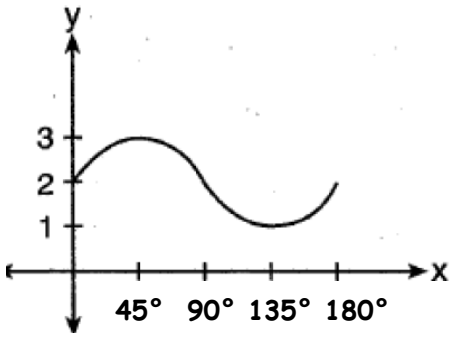
Amplitude =	Period =	Midline =

Write the equation for the following trigonometric functions.

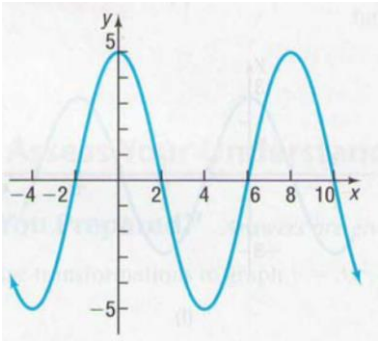
1) A radio transmitter sends a radio wave from the top of a 50-foot tower. The wave is represented by the accompanying graph.



2) The accompanying graph represents a portion of a sound wave.

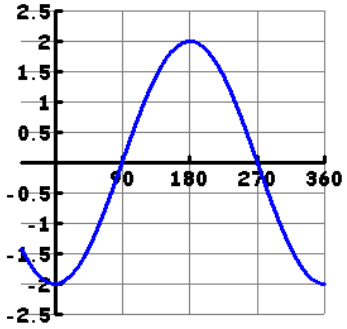


3)

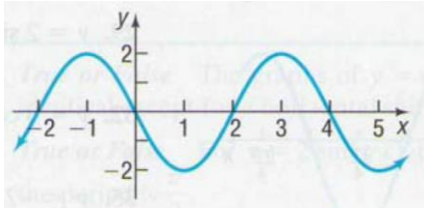


You Try! Write the equation for the following trigonometric functions.

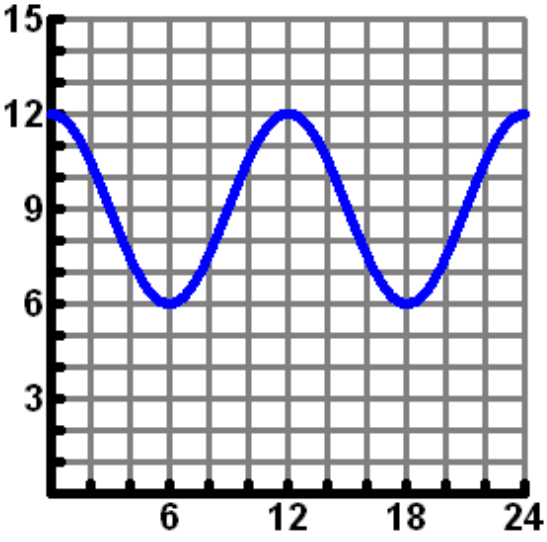
4)



5)



6)



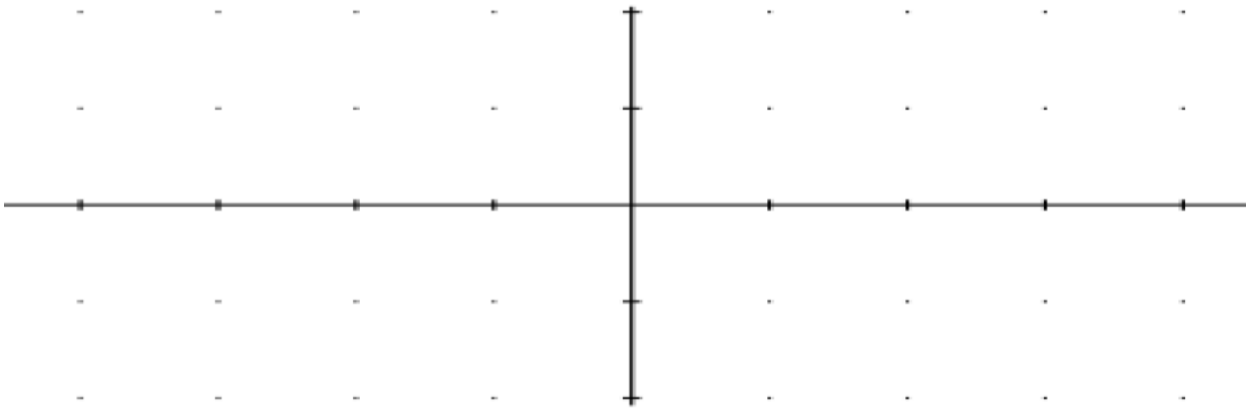
# of Hours after Midnight

The figure at the left shows that the depth of water at a boat dock varies with the tides. The depth is 6 feet at low tide and 12 feet at high tide. On a certain day, low tide occurs at 6 AM and high tide occurs at 12 Noon.

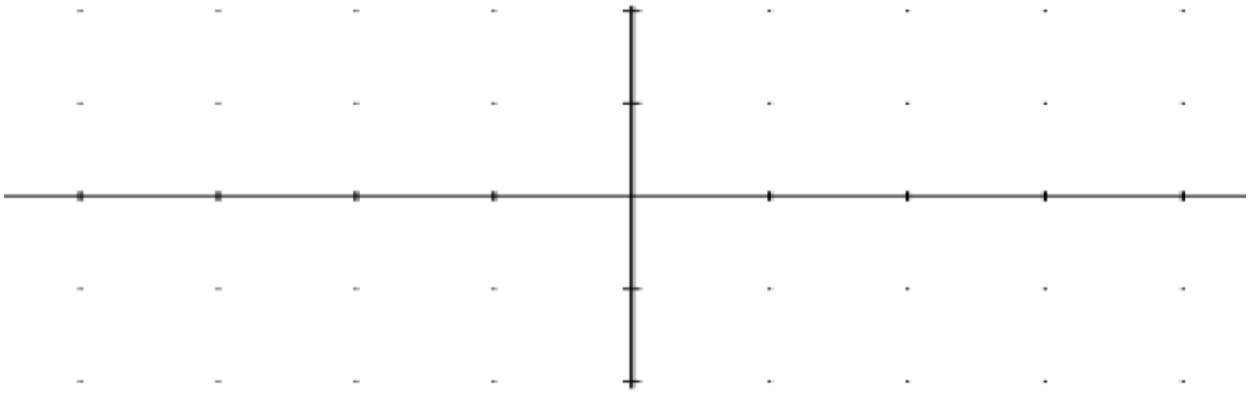
Day 10 Part 2 Notes: Graphing Practice, Writing Equations of Trig Functions

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

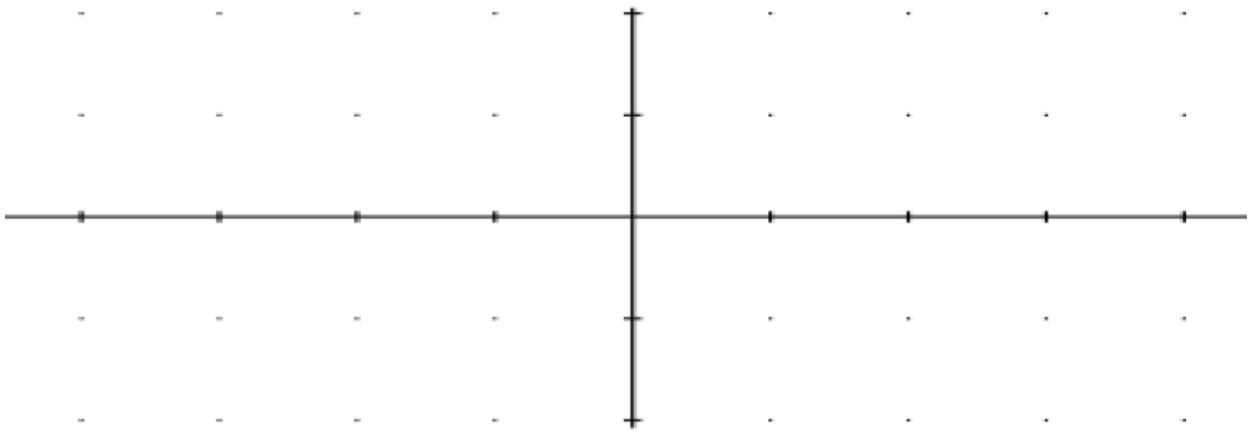
1. $y = -2 \sin (3x)$ Amplitude: _____ Midline: _____ Period: _____



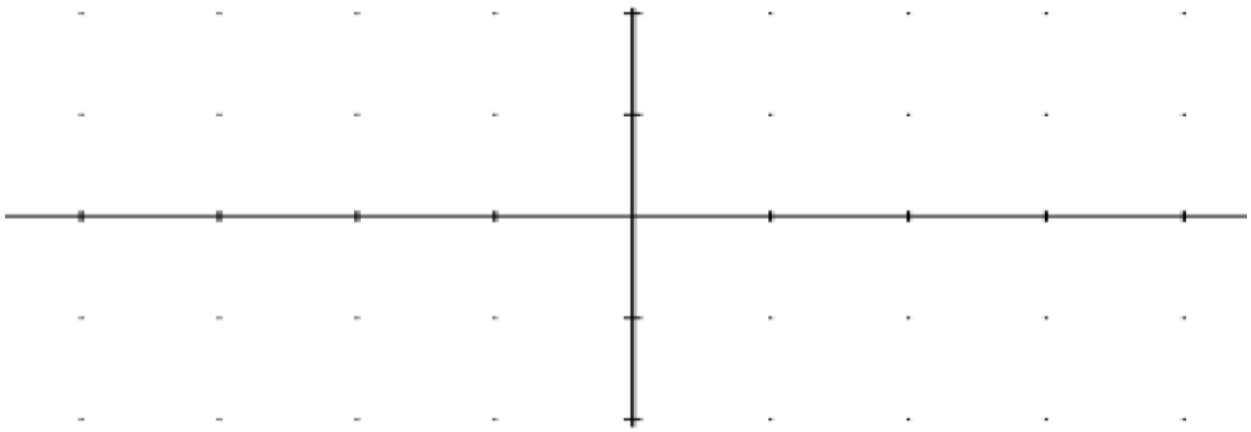
2. $y = \cos (2x) - 1$ Amplitude: _____ Midline: _____ Period: _____



3. $y = 3 \sin (1/2x)$ Amplitude: _____ Midline: _____ Period: _____



4. $y = -2\cos(4x) + 1$ Amplitude: _____ Midline: _____ Period: _____



Day 11: Evaluating Trig Functions

Warm-Up:

1. A water skier must be at least a horizontal distance of 50 feet from the boat in order to safely avoid undertow from the propeller. If the angle of elevation is 35° from the skier to the pole how long is the rope?

2. A 21-foot tree needs trimming. Safety guidelines say the angle made by the ladder and the ground should be 70°. How long should the ladder be to reach the top of the tree?

3. An isosceles triangle has a 34 degree vertex angle and a base 17 cm long. What is the perimeter of the triangle?

4. A person sitting on the balcony of her hotel room in Manhattan spots a skyscraper that is 420 feet away. From the balcony, the angle of elevation for the top of the skyscraper is 23°and the angle of depression to its base is 48°. How tall is the skyscraper?

Remember!!

a. Angles are measured in _____ or_____

b. 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 _____, but you should know that radians exist!

   → Make sure Degree is highlighted!

Day 11 (Part 1): Solving Trig Equations

Solving Sine, Cosine and Tangent Equations

1. We can solve equations involving _____, _____ and _____ just like any other equation!

2. Inverse operations of sine, cosine and tangent

   i. Sine →

   ii. ii. Cosine →

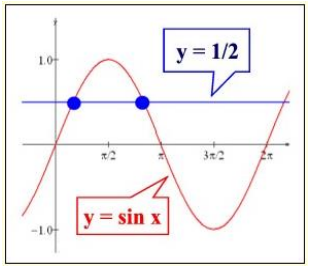
   iii. Tangent →

Use the inverse trig functions on your calculator to solve the following equations:

a. sin (x) = 0.3 b. sin (x + 2) = 1.5 c. 3 sin(x) = 2

Sometimes, there are more than one answer.

In Honors Math 2, we're only going to talk about one of them



$2\sin x - 1 = 0$

$2\sin x = 1$

$\sin x = \frac{1}{2}$

Solve the equations and express your answer to the nearest tenth of a degree:

1. sin (x) = 0.6 2. cos (x) = 1.5 3. tan (x) = -6.7

4. cos (x) = -0.87 5. 3sin (x) = 1.5 6. 4sin(x) = 1.2

Practice

Solve the following equations and express your answer to the nearest tenth degree:

1) sin (x) = 0.8	2) cos (x) = -0.78	3) tan (x) = -9.5	4) sin (x) = 0.366
5) sin (x) = -0.768	6) 3tan (x) = -12.8	7) 3sin (x) + 4 = 1.57	8) 4cos (x) – 6 = -5.2

You Try!

3) $2\sin(x)\cos(x) = \sqrt{2}\cos x$

4) $\sin(3x) + \frac{1}{2} = 0$

Day 11 Part 2 Complement exploration

An exploration

Use your graphing calculator to answer the following questions.

1. Use your calculator to find the following trig ratios. Round your answers to the nearest thousandth.

Sin (20) =	Cos (40) =	Tan (70) =
Sin (83) =	Cos (75) =	Tan (25) =

2. Find the sine, cosine, and tangent of a right triangle with a hypotenuse of 1 and angle of elevation of 45°.

a) What is the sine of 45°, rounded to the nearest thousandth? _____

b) What is the cosine of 45°, rounded to the nearest thousandth? _____

c) What is the tangent of 45°, rounded to the nearest thousandth? _____

d) What is special about the sine and cosine of 45°?

e) What is special about the tangent of 45°?

3. Use your calculator to find the following sine and cosine ratios.

Cos (20) = Sin (70) =	Cos (30) = Sin 60 =
Cos (60) = Sin (30) =	Cos (75) = Sin (15) =

What do you notice about sine and cosine when the angles add to 90°?

4. Use your calculator to find the following:

Tan(40) = $\frac{\sin(40)}{\cos(40)} =$	Tan(50) = $\frac{\sin(50)}{\cos(50)} =$

What conclusion can you draw about the relationship between the tangent function and sine and cosine?

Summary:

$\frac{\text{Sin(x)}}{\text{Cos(x)}}$ =

Sine and Cosine of complementary angles are _____.

Day 12/13 warm-up – do on a separate sheet of paper.

Warm-up: Solve the trig equations:

1.) $1 + \cos(x) = 0$ 2.) $2\sin(x)\cos(x) + \cos(x) = 0$ 3.) $2\tan(x)\sin(x) = 2\tan(x)$

4.) Find the area of the triangle if b = 11, a = 8, and Angle C = 37.

5.) Solve the triangle in problem #4.

6. Solve the problem. Round answer(s) to the nearest degree

a. $2\sin(x)\cos(x) = -\sqrt{2}\sin(x)$ b. $-2\cos(5x) = \sqrt{3}$

7. Angles F and G are complementary angles. As the measure of angle F changes by a set amount, sin(F) increases by 0.3. How does cos(G) change?

A. It increases by a greater amount.
B. It increases by the same amount.
C. It increases by a lesser amount.
D. It does not change.

Day 13 Warm Up – Review Day #2

1. Graph one period in the positive and negative direction for y = -2cos(3x) – 1.

2. Solve the triangle given b = 16, a = 10, and angle A = 30°.

3. The pilot of an airplane finds the angle of depression to an airport to be 16 degrees. If the altitude of the plane is 6000 meters, find the horizontal distance to the airport.

Solving more involved trigonometric Equations

Together!

1) $\sin(x) - \frac{\sqrt{3}}{2} = 0$

2) $2\sin(x)\cos(x) = \sqrt{3}\sin x$

You Try!

3) $2\cos(x) - 1 = 0$

4) $3\cos(x) + 2 = 2\cos x + 1$

Solving ***even more*** involved trigonometric Equations

Together!

1) $\cos(2x) - \frac{\sqrt{3}}{2} = 0$

2) $\sin^2(x) = 1$