**8.8 - Applications of Trig Functions**

1. The geese population in a certain area fluctuates periodically between a maximum of 600 geese and a minimum of 350 geese. This population cycle repeats every 5 years. Write a sine function to the model the geese population when time is measured in years.

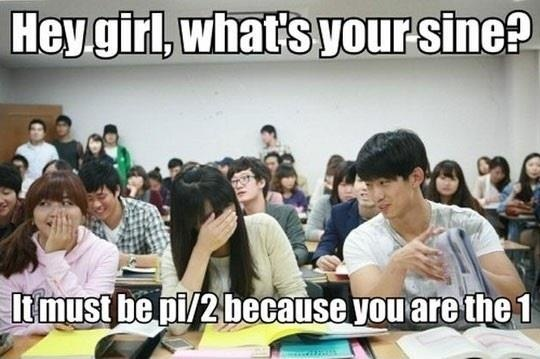
2. The average monthly temperature in Greenville varies periodically with a maximum of 69°F and a minimum of 41°F. A complete cycle repeats every year. Write a cosine function to model the temperature in Greenville when time is measured in months.

3. The function models the height of a rider on a Ferris wheel, where *x* represents time in minutes. Determine the maximum and minimum height the rider reaches, and determine the amount of time it takes for the rider to complete a full revolution.

4. A Ferris wheel has a diameter of 92 m and makes a complete revolution every 8 minutes.. The wheel starts turning when a rider is at its lowest point, 9 m above the ground. Write a cosine function to model the rider’s height above the ground when time is measured in minutes.

5. The function models the altitude of the midday sun at Venus’s equator, where *x* represents time in years. Determine the maximum and minimum altitude the sun reaches, and determine the amount of time it takes for the sun to complete a full cycle.

6. When an appliance is plugged into an outlet, voltage fluctuates between positive and negative values. In Barbados, the voltage fluctuates between 163 volts and −163 volts with a frequency of 50 cycles per second. Write a sine function to model the voltage when time is measured in seconds.



Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Math 3 Unit 8: Trigonometry**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **May 7**   * Angles in degrees   HW: worksheet 8.1 | **May 8**   * Angles in radians   HW: worksheet 8.2 | **May 9**   * Right triangle trig   HW: worksheet 8.3 | **May 10**   * Unit circle * Exact values of sine and cosine   HW: worksheet 8.4 | **May 11**   * QUIZ!! * Exact values of all trig functions   HW: worksheet 8.5 |
| **May 14**   * Graphs of sine and cosine   HW: worksheet 8.6 | **May 15**   * Equations of sine and cosine   HW: worksheet 8.7 | **May 16**   * QUIZ!! * Applications of trig functions   HW: worksheet 8.8 | **May 17**   * Review for test   HW: finish review | **May 18**   * TEST!!! |

**8.1 - Angles and Their Measures in Degrees**

*Draw each angle in standard position.*

1. 2. 3. 4.



5. 6. 7. 8.



*Find one positive and one negative coterminal angle that corresponds to the given angle.*

9. 10. 11. 12.

*Determine an angle between and that is coterminal to the given angle.*

13. 14. 15. 16.

**8.7 - Equations of Sine and Cosine Worksheet**

1. 2.

Amplitude:\_\_\_\_\_\_\_\_ Amplitude:\_\_\_\_\_\_\_\_

Period:\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_\_\_

Frequency:\_\_\_\_\_\_\_\_ Frequency:\_\_\_\_\_\_\_\_

Vertical Shift:\_\_\_\_\_\_\_\_ Vertical Shift:\_\_\_\_\_\_\_\_

3. 4.

Amplitude:\_\_\_\_\_\_\_\_ Amplitude:\_\_\_\_\_\_\_\_

Period:\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_\_\_

Frequency:\_\_\_\_\_\_\_\_ Frequency:\_\_\_\_\_\_\_\_

Vertical Shift:\_\_\_\_\_\_\_\_ Vertical Shift:\_\_\_\_\_\_\_\_

5. 6.

Amplitude:\_\_\_\_\_\_\_\_ Amplitude:\_\_\_\_\_\_\_\_

Period:\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_\_\_

Frequency:\_\_\_\_\_\_\_\_ Frequency:\_\_\_\_\_\_\_\_

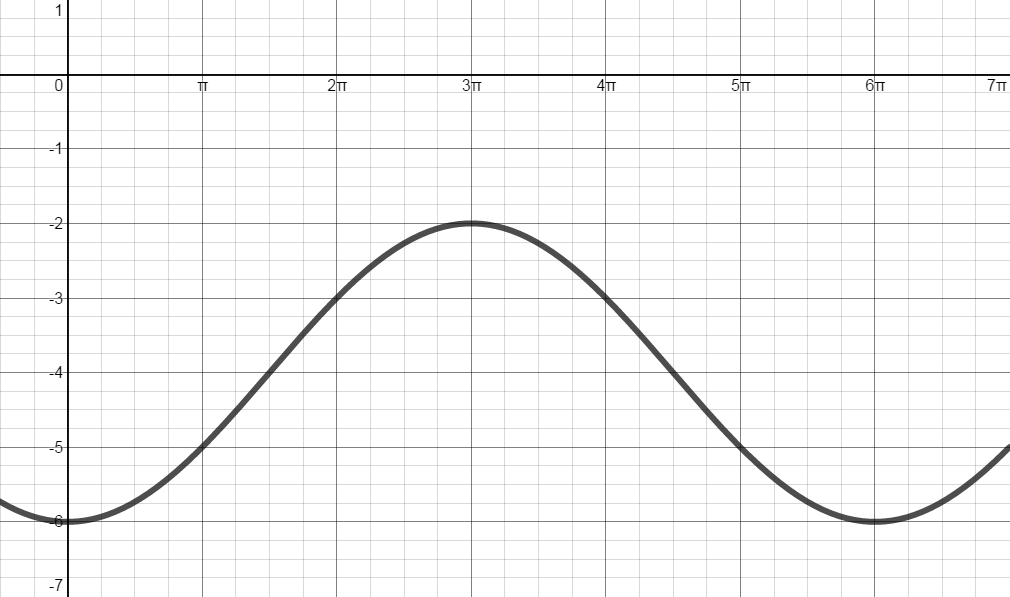
Vertical Shift:\_\_\_\_\_\_\_\_ Vertical Shift:\_\_\_\_\_\_\_\_

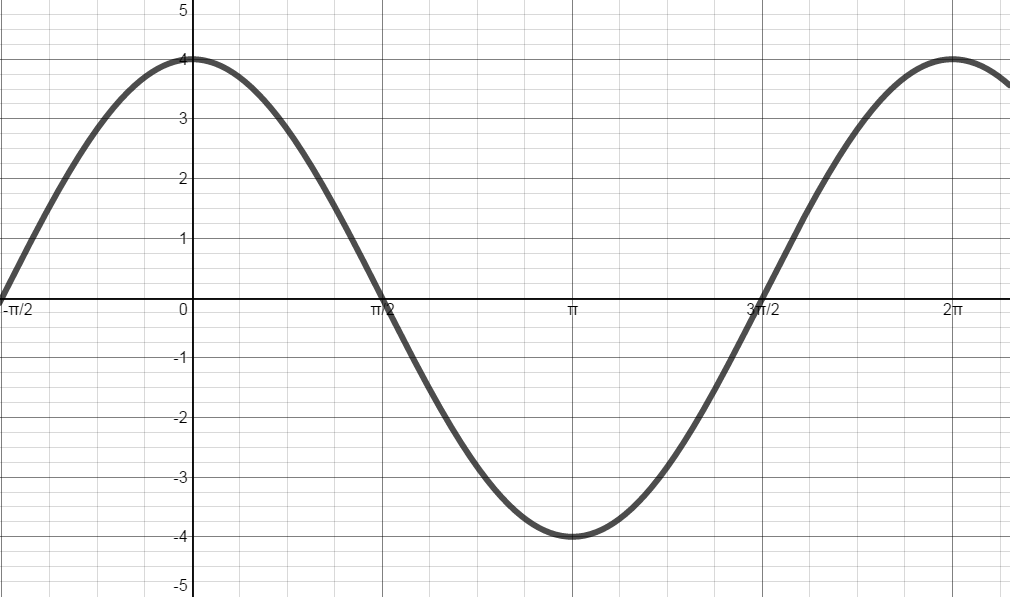
7. Given an amplitude of 7, a period of 4𝜋, and a vertical shift down 3 units, write the equation of the sine function.

8. Given an amplitude of 3, a frequency of , and a vertical shift up 7 units, write the equation of the cosine function.

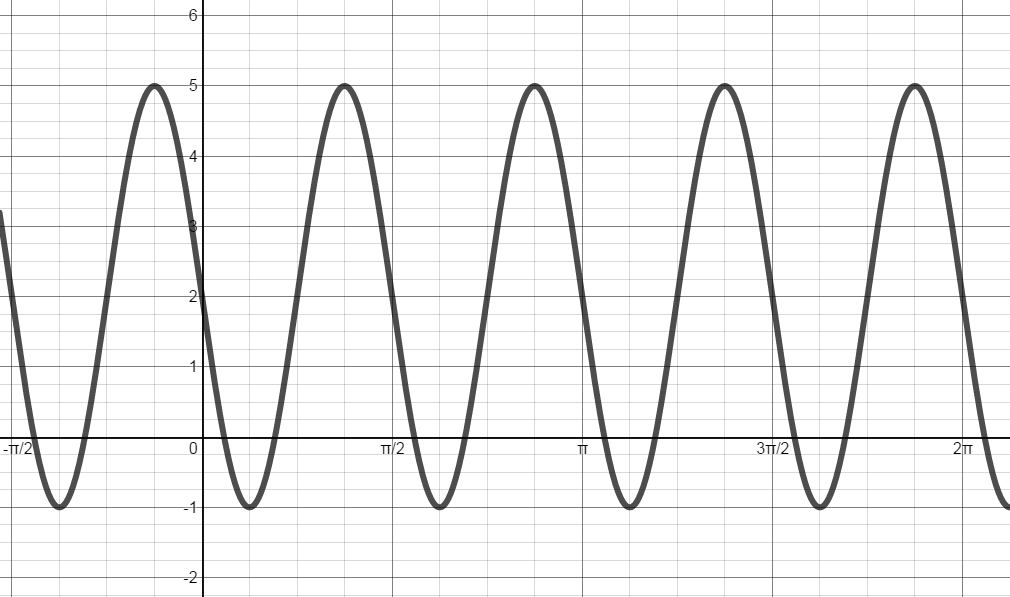
9. Given an amplitude of 7456, a period of , and a vertical shift up 81903 units, write the equation of the sine function.

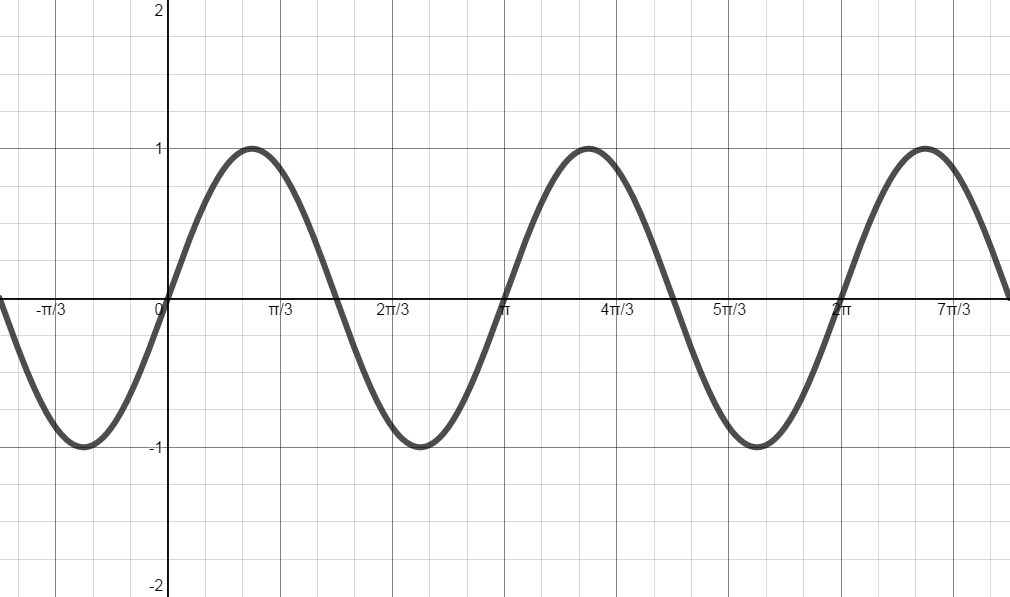
**8.6 - Graphs of Sine and Cosine**

*Determine the amplitude, period, frequency, vertical shift, and equation for each graph below.*



A B





C D

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Amplitude** | **Period** | **Frequency** | **Vertical Shift** | **Equation** |
| A |  |  |  |  |  |
| B |  |  |  |  |  |
| C |  |  |  |  |  |
| D |  |  |  |  |  |

**8.2 - Angles and Their Measures in Radians**

*Convert angle in degrees to radians.*

1. 2. 3. 4.

*Convert each angle in radians to degrees.*

5. 6. 7. 8.

*Draw each angle in standard position.*

9. 10. 11. 12.

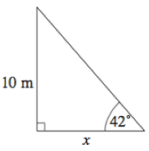
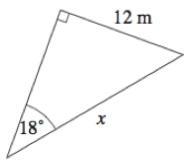


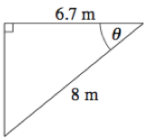
13. 14. 15. 16.

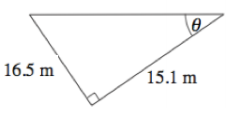


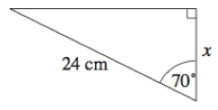
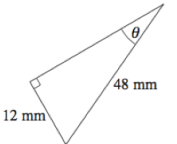
**8.3 - Right Triangle Trig**

*Solve for the variable.*



1. 2. 3.



4. 5. 6. 

7. The flagpole casts a shadow 40 feet long when the measurement of the angle of elevation to the sun is 31°. How tall is the flagpole?

8. A submarine dives at an angle of depression of 15°. It travels a horizontal distance of 1500 feet during the dive. What is the depth of the submarine after the dive?

9. Sally is standing a distance away from a skyscraper that is 780 feet tall. Marcie is between Sally and the skyscraper. The angle of elevation from Sally’s position to the top of the skyscraper is 42°. The angle of elevation from Marcie’s position to the top of the skyscraper is 71°. How far is Sally from Marcie?

*Use the unit circle to determine the exact value of each trigonometric function.*

1. = 2. =

3. = 4. =

5. = 6. =

7. = 8. =

9. = 10. =

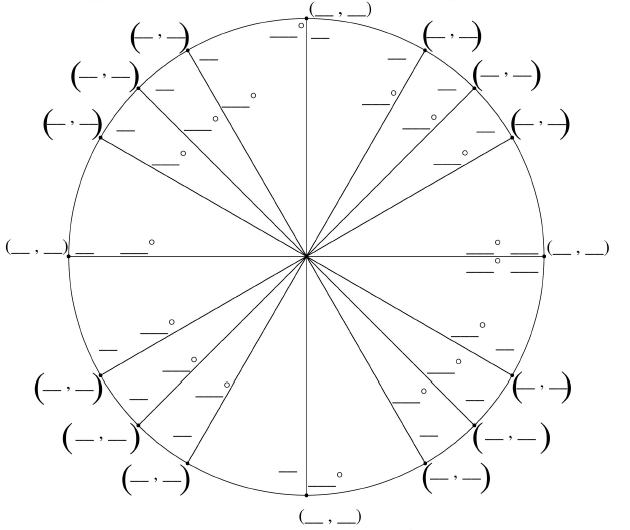
11. = 12. =

13. = 14. =

15. = 16. =

**8.5 - Exact Values of Trig Functions**

*Complete the unit circle*

****



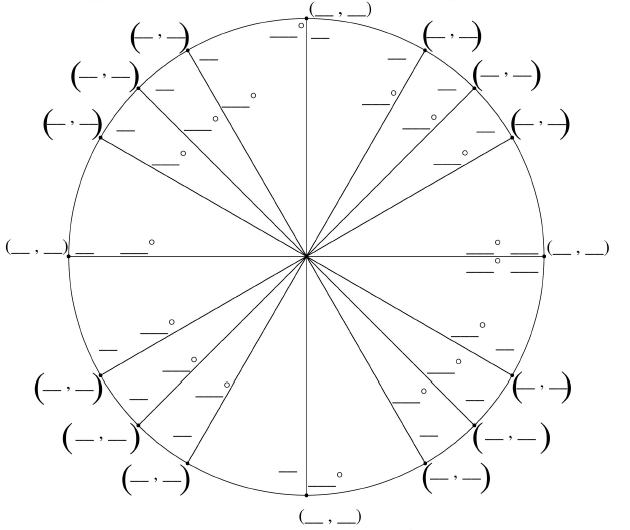
**….said no teacher ever.**

**Turn the page to get to homework 8.4**

**(Like I would really give you a day without homework. Puh-lease)**

**8.4 - Exact Values of Sine and Cosine worksheet**

*Complete the unit circle.*



*Use the unit circle to determine the exact value of each trigonometric function.*

1. = 2. =

3. = 4. =

5. = 6. =

7. = 8. =

9. = 10. =

11. = 12. =

13. = 14. =