Name _____

Hey girl, what's your sine?

It must be pi/2 because you are the 1

Math 3 Unit 7: Trigonometry

|	April 23	April 24	April 25	April 26
	● Angles in degrees ● Trigonometry to solve for sides ● HW: 7.1	● Angles in radians ● Trigonometry to solve for angles ● HW: 7.2	● Unit Circle ● HW: 7.3	● QUIZ!!! ● Unit Circle ● HW: 7.4
April 29 ● Graphs of sine and cosine ● HW: 7.5	**April 30** ● Equations of sine and cosine ● HW: 7.6	**May 1** ● QUIZ!!! (unit circle) ● Applications ● HW: 7.7	**May 2** ● Review ● HW: finish review	**May 3** ● TEST!!!

7.1 - Angles and Their Measures in Degrees
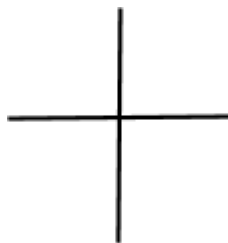
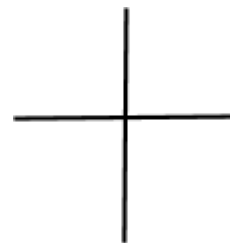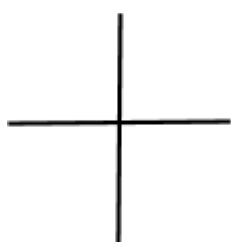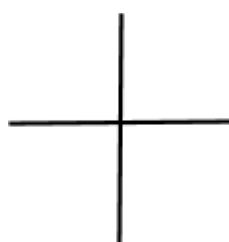*Draw each angle in standard position.*

1. 120°

2. -240°

3. 550°

4. -270°

5. 300°

6. 40°

7. -400°

8. -100°
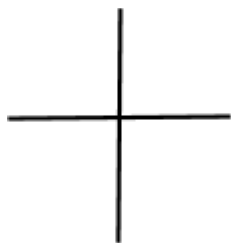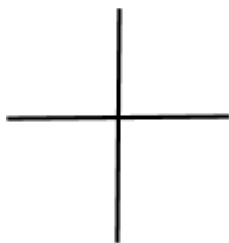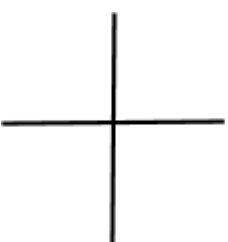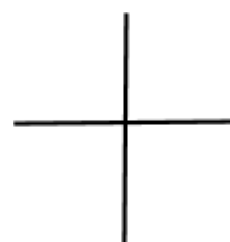
Find one positive and one negative coterminal angle that corresponds to the given angle.

9. 55°

10. -40°

11. -1600°

12. 415°

Determine an angle between 0° and 360° that is coterminal to the given angle.

13. 665°

14. -70°

15. -640°

16. 1190°

Solve for the variable.

17.

18.
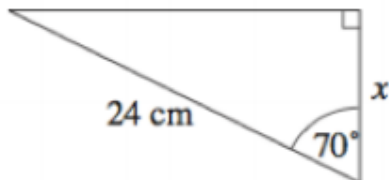
19.
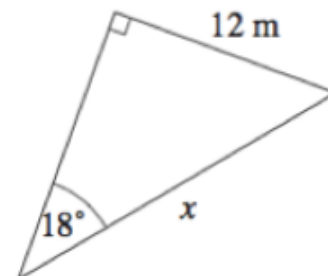
20. The flagpole casts a shadow 40 feet long when the measurement of the angle of elevation to the sun is 31°. How tall is the flagpole?

7.2 - Angles and Their Measures in Radians

Convert angle in degrees to radians.

1. 18°

2. 150°

3. 330°

4. -270°

Convert each angle in radians to degrees.

5. $\frac{\pi}{9}$
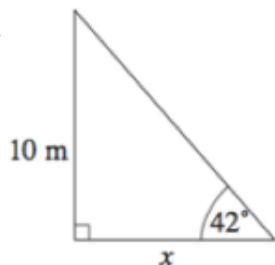
6. $\frac{3\pi}{4}$

7. $\frac{11\pi}{6}$

7. $-\frac{25\pi}{18}$

Draw each angle in standard position.

9. $\frac{5\pi}{6}$

10. $-\frac{\pi}{4}$

11. $\frac{10\pi}{3}$

12. $-\frac{7\pi}{6}$

13. π

14. $-\frac{2\pi}{3}$

15. $-\frac{7\pi}{3}$

16. $\frac{11\pi}{6}$

Solve for the variable.

17.

6.7 m

θ

8 m

18.

θ

48 mm

12 mm

19.

16.5 m

θ

15.1 m
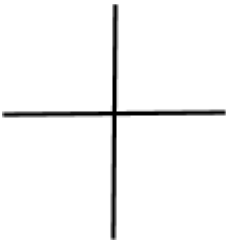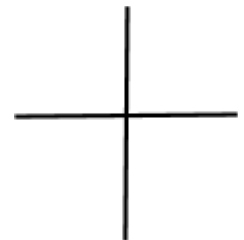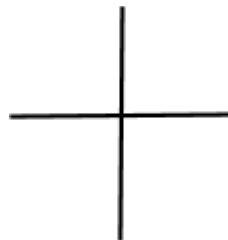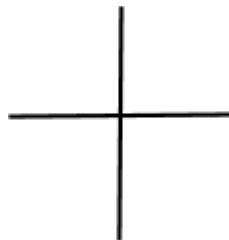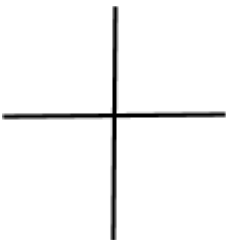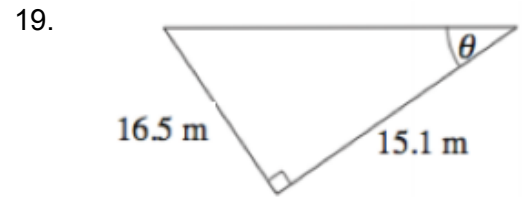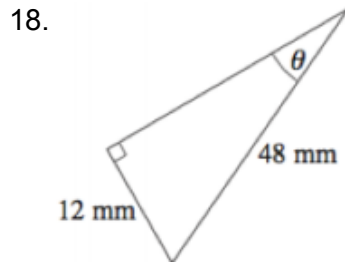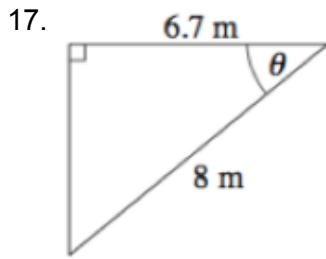
20. A submarine dives at an angle of depression of 15°. It travels a horizontal distance of 1500 feet during the dive. What is the depth of the submarine after the dive?
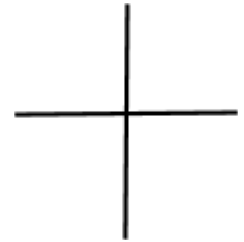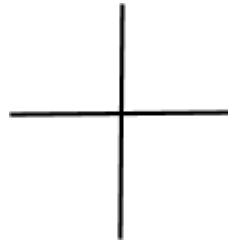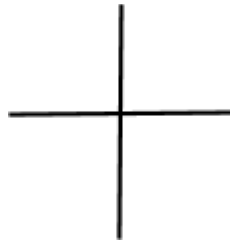
21. Sally is standing a distance away from a skyscraper that is 780 feet tall. Marcie is between Sally and the skyscraper. The angle of elevation from Sally's position to the top of the skyscraper is 42°. The angle of elevation from Marcie's position to the top of the skyscraper is 71°. How far is Sally from Marcie?

22. Bugs Bunny was 33 meters below ground, digging his way toward Pismo Beach, when he realized he wanted to be above ground. He turned and dug through the dirt diagonally for 80 meters until he was above ground. What is the angle of elevation, *in degrees*, of Bugs Bunny's climb?

7.3 - Exact Values of Sine and Cosine

Complete the unit circle.

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

1. $\sin 45^o =$

2. $\cos 0 =$

3. $\sin -210^o =$

4. $\cos \frac{3\pi}{4} =$

5. $\sin \frac{4\pi}{3} =$

6. $\cos 240^o =$

7. $\sin \frac{8\pi}{3} =$

7. $\cos -90^o =$

9. $\sin -855^o =$

10. $\cos 570^o =$

11. $\sin 270^o =$

12. $\cos -\frac{\pi}{3} =$

13. $\sin -3\pi =$

14. $\cos \frac{11\pi}{6} =$

7.4 - Exact Values of Trig Functions

Complete the unit circle

$$(\_\_,\_\_)$$

$$\left(\dfrac{-}{-},\dfrac{-}{-}\right) \qquad \underline{\quad}^{\circ} \qquad \left(\dfrac{-}{-},\dfrac{-}{-}\right)$$

$$\left(\dfrac{-}{-},\dfrac{-}{-}\right) \qquad \underline{\quad}^{\circ} \qquad \left(\dfrac{-}{-},\dfrac{-}{-}\right)$$

$$\left(\dfrac{-}{-},\dfrac{-}{-}\right) \qquad \qquad \left(\dfrac{-}{-},\dfrac{-}{-}\right)$$

$$(\_\_,\_\_) \qquad \qquad (\_\_,\_\_)$$

$$\left(\dfrac{-}{-},\dfrac{-}{-}\right) \qquad \qquad \left(\dfrac{-}{-},\dfrac{-}{-}\right)$$

$$\left(\dfrac{-}{-},\dfrac{-}{-}\right) \qquad \qquad \left(\dfrac{-}{-},\dfrac{-}{-}\right)$$

$$\left(\dfrac{-}{-},\dfrac{-}{-}\right) \qquad \qquad \left(\dfrac{-}{-},\dfrac{-}{-}\right)$$

$$(\_\_,\_\_)$$
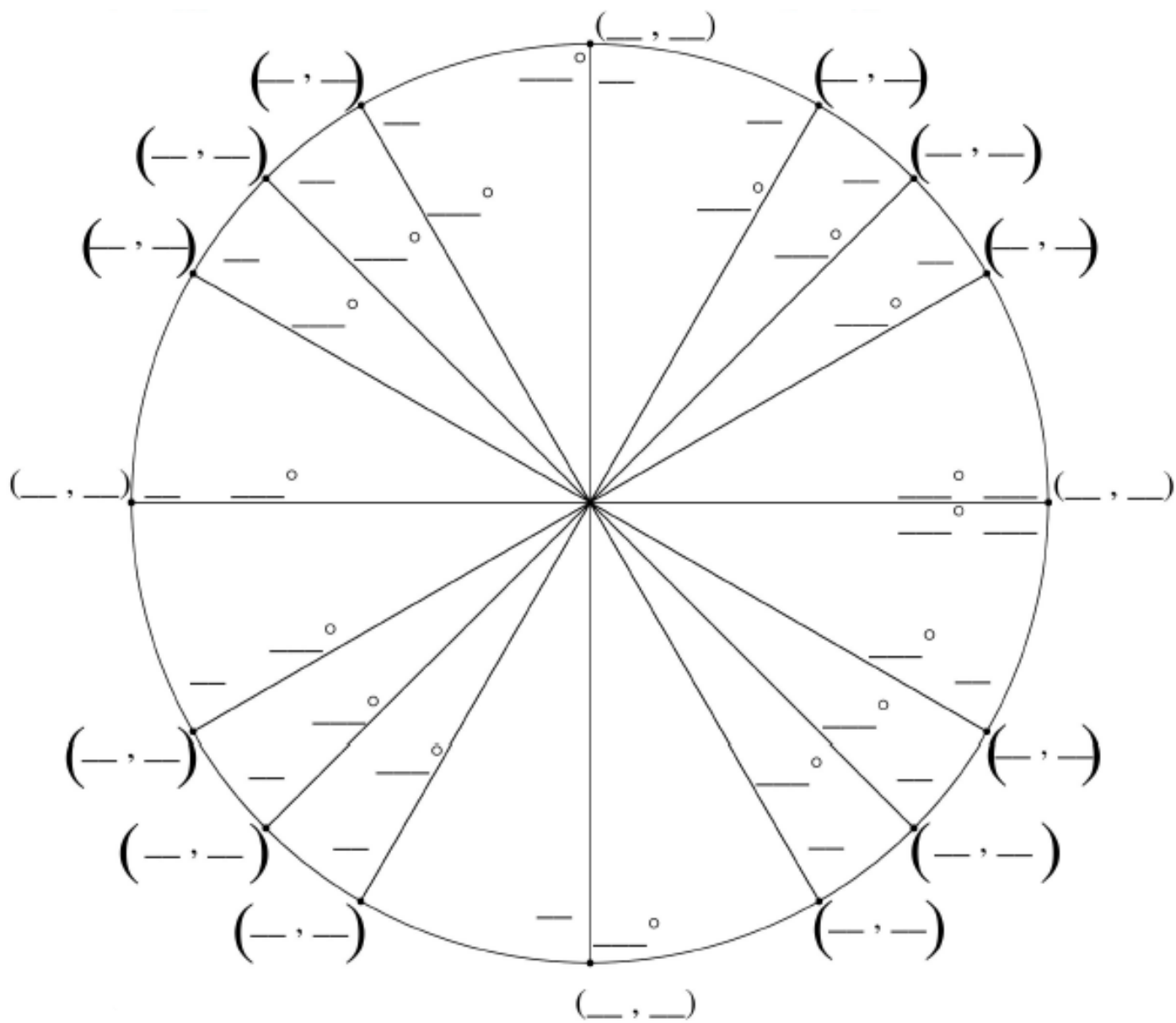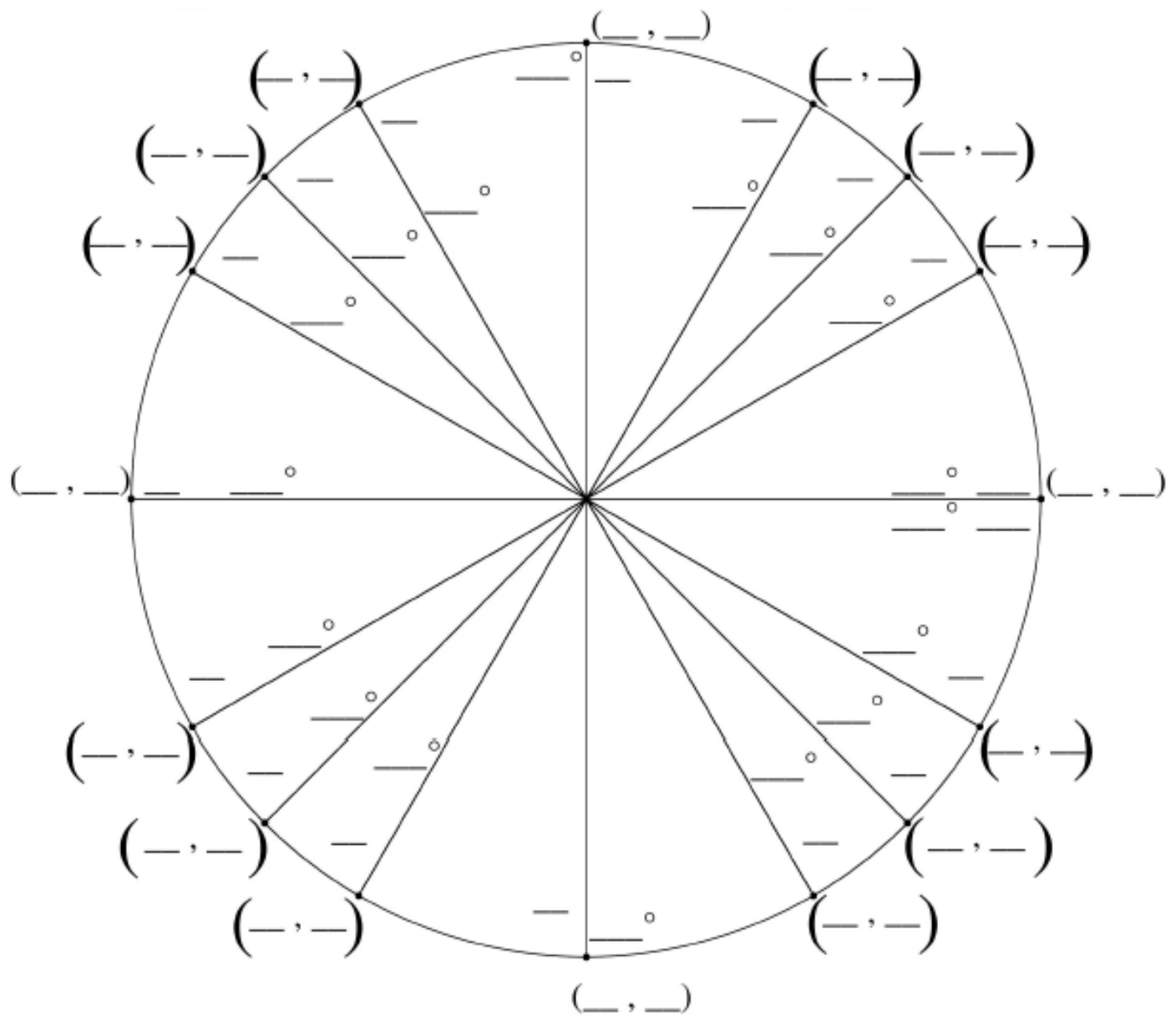
KEEP GOING ------->

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

1. $\sin 225^o =$

2. $\cos 150^o =$

3. $\tan 60^o =$

4. $\sin \frac{\pi}{6} =$

5. $\sec \frac{2\pi}{3} =$

6. $\cot \frac{5\pi}{3} =$

7. $\tan 90^o =$

7. $\cos \pi =$

9. $\csc \frac{3\pi}{4} =$

10. $\sin 2\pi =$

11. $\cos -30^o =$

12. $\sec 585^o =$

13. $\cot 180^o =$

14. $\sin \frac{\pi}{2} =$

15. $\cos 270^o =$

16. $\sec \frac{7\pi}{6} =$

7.5 - Graphs of Sine and Cosine

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

A

B

C

D
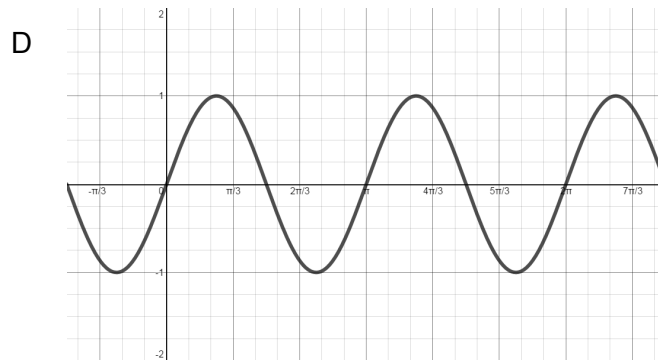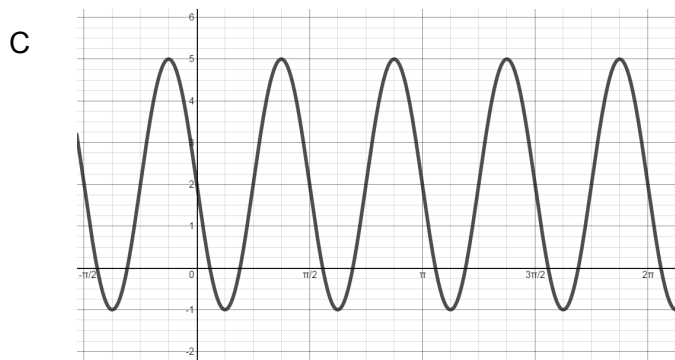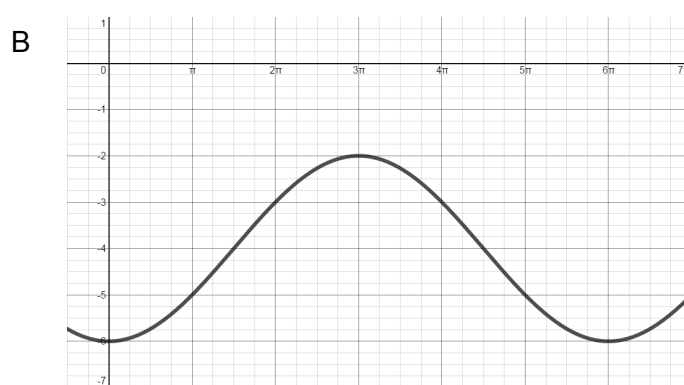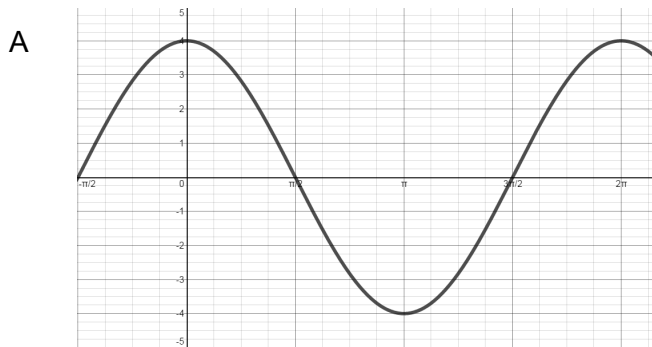
	Amplitude	Period	Frequency	Vertical Shift	Equation
A					
B					
C					
D					

7.6 - Equations of Sine and Cosine

1. $y = -4\cos 4x + 7$

Amplitude:_____

Period:_____

Frequency:_____

Vertical Shift:_____

2. $y = 6\sin\frac{1}{3}x - 4$

Amplitude:_____

Period:_____

Frequency:_____

Vertical Shift:_____

3. $y = \sin x + 2$

Amplitude:_____

Period:_____

Frequency:_____

Vertical Shift:_____

4. $y = \frac{1}{2}\cos\frac{4}{3}x$

Amplitude:_____

Period:_____

Frequency:_____

Vertical Shift:_____

5. $y = -2\cos 8x - 4$

Amplitude:_____

Period:_____

Frequency:_____

Vertical Shift:_____

6. $y = -\sin 3x + 1$

Amplitude:_____

Period:_____

Frequency:_____

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 $\frac{1}{\pi}$, and a vertical shift up 7 units, write the equation of the cosine function.

9. Given an amplitude of 7456, a period of $\frac{\pi}{46}$, and a vertical shift up 81903 units, write the equation of the sine function.

7.7 - 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 $f(x) = -33\cos\left(\frac{\pi}{6}x\right) + 40$ 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 $f(x) = 1.3\cos(4\pi x) + 87.7$ 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.