

1. Fill in the following table. Each line corresponds to a point on the unit circle:

Degrees	Radians	X-coordinate	Y-coordinate
0°	0 or $2\pi$	1	0
30°			
45°			
60°			
90°			

State the *exact value* (in simplified form) of the following trig functions and given angle.

2. $\cos 45^\circ$	3. $\tan \frac{\pi}{6}$
4. $\csc \frac{\pi}{3}$	5. $\sec 60^\circ$

Find the *exact value* (in simplified form) of each expression.

6. $\cot \frac{\pi}{2} + \cos \frac{\pi}{6}$	7. $\tan^2 60^\circ \times \sec^2 60^\circ$
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Use the symmetry of the unit circle and reference angles as needed to state the *exact value* (in simplified form) of the following trig functions for the given angle. Show all work.

8. $\tan 1050^\circ$	9. $\sec \frac{23\pi}{6}$
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10. Convert degrees from DMS to decimal or decimal to DMS:  $32^{\circ}47'50''$  (Round to four decimal places.)

11. Convert degrees from decimal to DMS:  $112.762^{\circ}$

12. Find the area and length of the perimeter of a piece of pie if the central angle is  $45^{\circ}$  and the radius is 3 inches.

13. Find the ordered pair of the point in the unit circle that is on the terminal side of

$$\theta = \frac{7\pi}{6}.$$

14. Write the equation of the sine function with amplitude 3, period  $\pi$  center line -1 and

horizontal shift  $\frac{\pi}{2}$ .

15. Triangle ABC has a right angle at C if  $\csc B = 5/2$ , what is the  $\cot B$ ?

Give the amplitude, period, horizontal shift, and vertical shift, of each function.

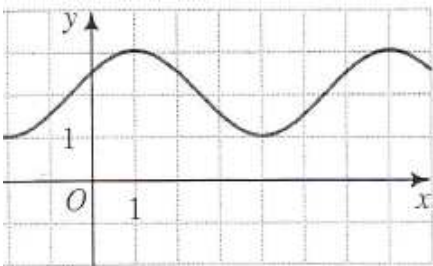
16.  $y = -2 \cos 2t$                       Amplitude \_\_\_\_\_                      Period \_\_\_\_\_  
 Horizontal Shift \_\_\_\_\_                      Vertical Shift \_\_\_\_\_  
 Reflection? *Yes or No*

17.  $y = 3 + 5 \sin 2x$                       Amplitude \_\_\_\_\_                      Period \_\_\_\_\_  
 Horizontal Shift \_\_\_\_\_                      Vertical Shift \_\_\_\_\_  
 Reflection? *Yes or No*

18.  $y = 6 \sin \left( \frac{\pi}{4}x + \frac{\pi}{2} \right) - 3$                       Amplitude \_\_\_\_\_                      Period \_\_\_\_\_  
 Horizontal Shift \_\_\_\_\_                      Vertical Shift \_\_\_\_\_  
 Reflection? *Yes or No*

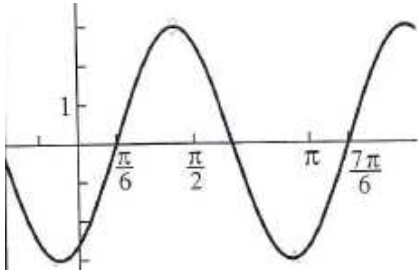
Give the amplitude, period, horizontal shift, vertical shift and whether or not each function is reflected across the x-axis. Write the equation for each curve in terms of cosine.

19.                      Amplitude \_\_\_\_\_                      Period \_\_\_\_\_  
 Horizontal Shift \_\_\_\_\_                      Vertical Shift \_\_\_\_\_  
 Reflection? *Yes or No*  
 Equation \_\_\_\_\_



Give the amplitude, period, horizontal shift, and vertical shift of each function. Write the equation for each curve in terms of sine.

20.



Amplitude \_\_\_\_\_ Period \_\_\_\_\_

Horizontal Shift \_\_\_\_\_ Vertical Shift \_\_\_\_\_

Reflection? *Yes or No*

Equation \_\_\_\_\_

Identify the period, asymptotes, horizontal shift, vertical shift, and any other transformation of each function.

21.  $y = 3 \tan \frac{\pi}{3}(x+1) - 4$

Period \_\_\_\_\_ Horizontal Shift \_\_\_\_\_

Vertical Shift \_\_\_\_\_ Asymptotes \_\_\_\_\_

Reflection? *Yes or No*

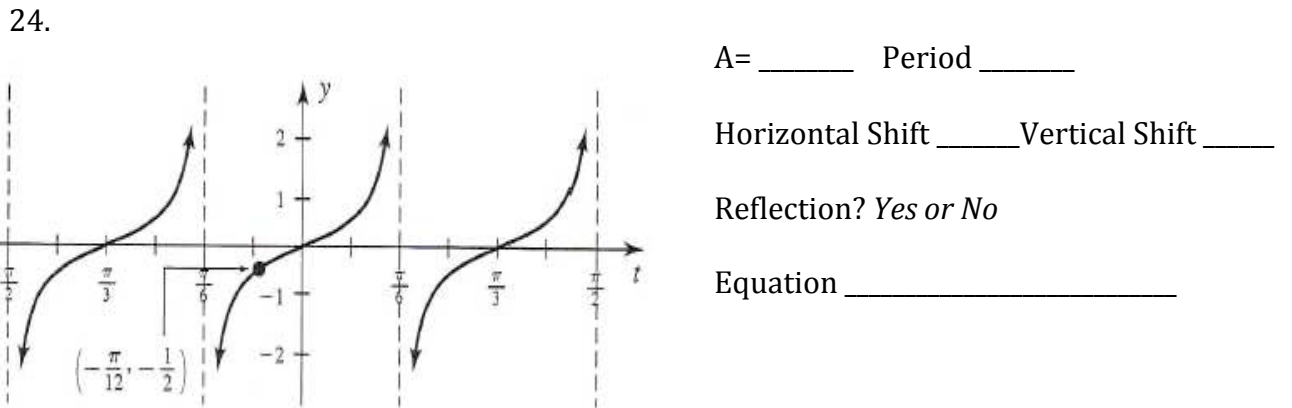
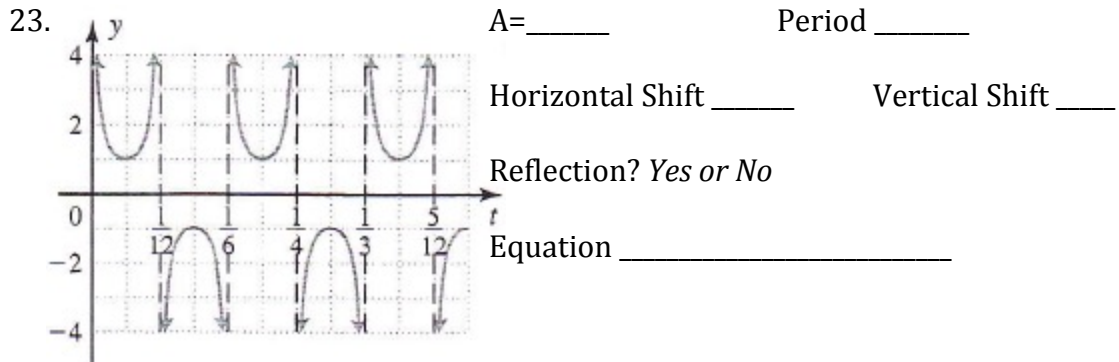
22.  $y = 2 \csc \left( \frac{\pi}{6}x + \frac{\pi}{2} \right) + 1$

Period \_\_\_\_\_ Horizontal Shift \_\_\_\_\_

Vertical Shift \_\_\_\_\_ Asymptotes \_\_\_\_\_

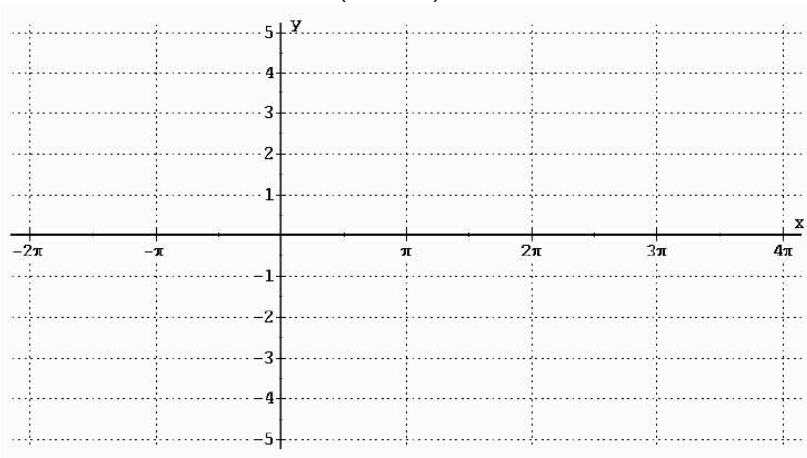
Other Transformations? Reflection? *Yes or No*

Identify the period, asymptotes, horizontal shift, vertical shift, and any other transformation of each function. Write the equation for each curve.



Rewrite each function; find the amplitude, period, horizontal shift, and vertical shift (write this as an equation  $y = \text{center line}$ ). Graph each function

25. 
$$y = -\cos\left(x + \frac{\pi}{2}\right) + 1$$



A) Center line \_\_\_\_\_

B) Amplitude \_\_\_\_\_

C) Period \_\_\_\_\_

D) Range \_\_\_\_\_

E) Horizontal shift \_\_\_\_\_

Give a complete analysis and sketch one period of the graph of each equation.

26.  $y = -2 \cot \frac{\pi}{3}(x)$

Period \_\_\_\_ Horizontal Shift \_\_\_\_

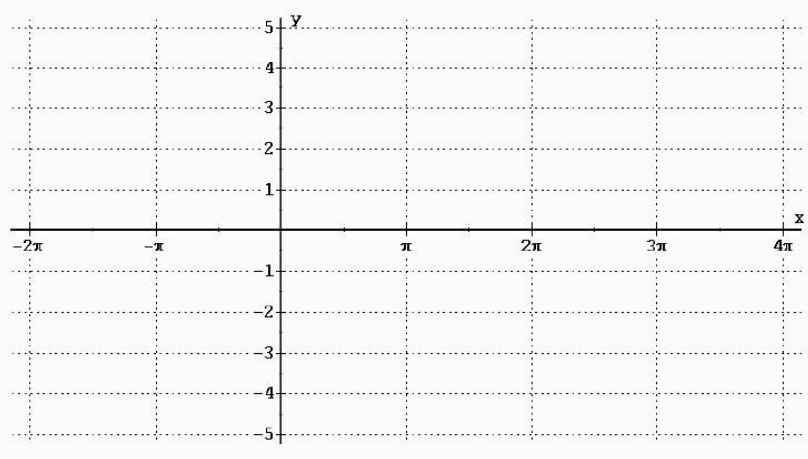
Vertical Shift \_\_\_\_

Asymptotes \_\_\_\_\_

Reflection? *Yes or No*

Domain

Range



Give a complete analysis and sketch one period of the graph of each equation.

27.  $y = -\csc\left(\frac{1}{2}x\right) + 1$

Period \_\_\_\_ Horizontal Shift \_\_\_\_

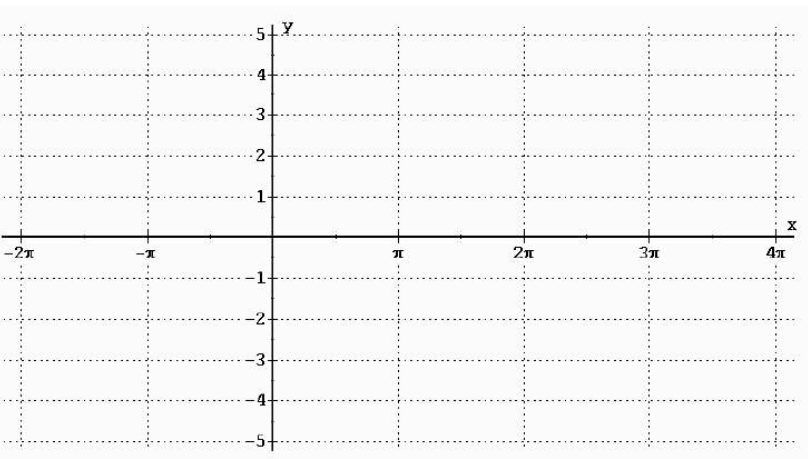
Vertical Shift \_\_\_\_

Asymptotes \_\_\_\_\_

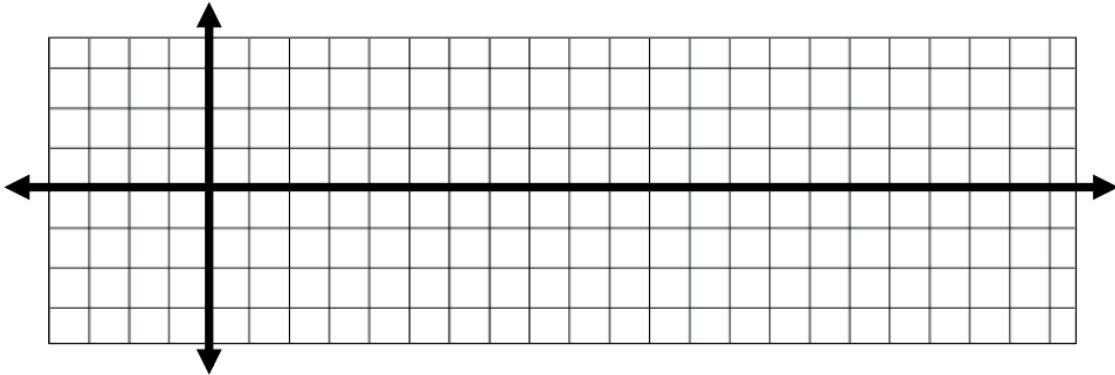
Reflection? *Yes or No*

Domain

Range



28. In Vancouver, British Columbia, the number of hours of daylight reaches a low of 8.3 hours in January, and a high of nearly 16.2 hours in July. (a) Find a cosine equation model for the number of daylight hours each month; (b) sketch the graph; and (c) approximate the number of days each year there are more than 15 hours of daylight. Use  $1\text{ month} \approx 30.5$  days. Assume  $t = 0$  corresponds to January 1.



29. Observing wildlife: From her elevated observation post 300ft away a naturalist spots a troop of baboons high up in a tree. Using the small transit attached to her telescope, she finds the angle of depression to the bottom of this tree is  $14^\circ$ , while the angle of elevation to the top of the tree is  $25^\circ$ . The angle of elevation to the troop of baboons is  $21^\circ$ . Use this information to find (a) the height of the observation post, (b) the height of the baboons' tree, and (c) the height of the baboons above ground.