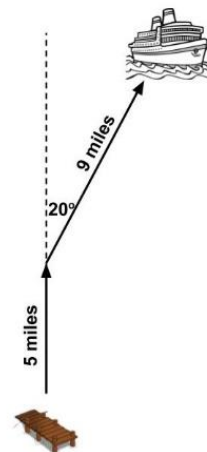


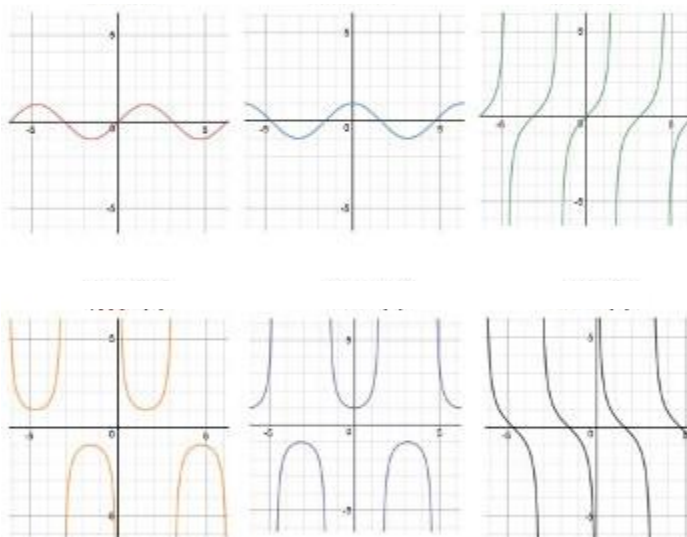
1. Find the perimeter and area of an equilateral triangle with sides of length 10 inches.

2. A ship leaves a port traveling due north. After 5 miles, the ship turns  $20^\circ$  east of north and travels 9 more miles. At this point, how far is the ship from the port?



3. In triangle XYZ,  $XY=5\text{mm}$ ,  $YZ=8\text{mm}$ , and  $m\angle Y=56^\circ$ . Find the length of XZ to the nearest tenth of a millimeter.

4. Match the six trigonometric parent functions with their graph. ( $\cos x$ ,  $\sin x$ ,  $\csc x$ ,  $\sec x$ ,  $\tan x$ ,  $\cot x$ )



5. A trigonometric function is shown below.

$$f(x) = 5 \cos x + 2$$

Which key feature(s) are true for the function?

- I. The graph has reflectional symmetry over the x-axis
- II. The domain of the graph is all real numbers and the range is  $[-3, 7]$
- III. The function has zeros at  $k\pi$ , where  $k$  is an odd integer.

6. A trigonometric function is shown below.

$$f(x) = 7 \sin\left(x + \frac{\pi}{6}\right) - 4$$

List the transformations

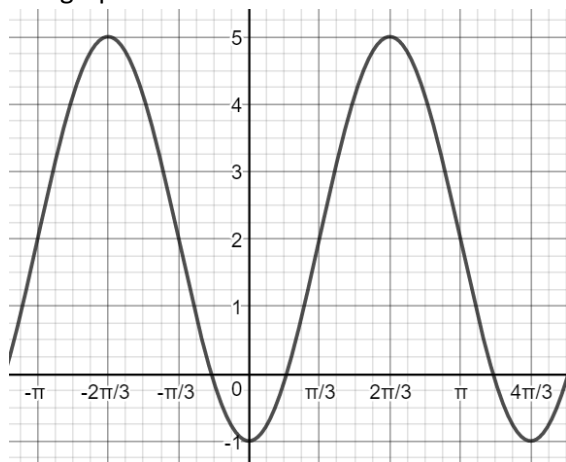
- Amplitude:
- Phase shift:
- Vertical shift:
- Period:

7. An ice cream truck that plays loud music is circling Chuby's neighborhood.  $C(t)$  models the volume of the music (in dB) that Chuby hears,  $t$  minutes after the truck arrives in his neighborhood.

$$C(t) = -15 \cos\left(\frac{2\pi}{15}t\right) + 65$$

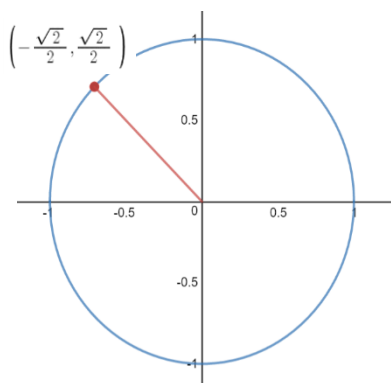
What is the period of this function?

8. The graph of a sinusoidal function is shown.



Write a sine function and a cosine function to represent the graph.

9. The terminal side of an angle is modeled in the diagram below. Which angle rotation(s) could be represented by the terminal side in the diagram?



- I.  $45^\circ$
- II.  $\frac{3\pi}{4}$
- III.  $135^\circ$
- IV.  $-\frac{5\pi}{4}$

10. The average depth of water at the end of a dock is 6 feet. This varies 2 feet in both directions with the tide. Suppose there is a high tide at 4 AM. If the tide goes from low to high every 6 hours, write a cosine function  $d(t)$  describing the depth of the water as a function of time with  $t = 4$  corresponding to 4 AM.