

Assignment

Write

Write a definition for each term in your own words.

1. sine function
2. cosine function
3. trigonometric function
4. periodicity identity

Remember

The cosine of the central angle measure of a unit circle is the x -coordinate of the point where the terminal ray intersects the unit circle and the sine of the same central angle measure is the y -coordinate of the same point.

The sine function, $y = \sin x$, and cosine function, $y = \cos x$, are periodic trigonometric functions that take angle measures (θ values) as inputs and outputs real number values, which correspond to coordinates of points on the unit circle. The period of each function is 2π radians, therefore $\sin(x + 2\pi) = \sin x$ and $\cos(x + 2\pi) = \cos x$.

Practice

1. Determine θ and $\cos \theta$ when $\sin \theta = \frac{\sqrt{3}}{2}$ and $\cos \theta$ is negative. Restrict values for θ such that $0 \leq \theta \leq 2\pi$.
2. Determine θ and $\sin \theta$ when $\cos \theta = -\frac{\sqrt{2}}{2}$ and $\sin \theta$ is negative. Restrict values for θ such that $0 \leq \theta \leq 2\pi$.
3. Determine 3 values for θ such that $\sin \theta = -\frac{\sqrt{3}}{2}$.
4. Determine 3 values for θ such that $\cos \theta = \frac{\sqrt{2}}{2}$.
5. Determine 3 values for θ such that $\cos \theta = 0$.
6. Determine the value of each ratio.
 - a. $\sin\left(\frac{15\pi}{4}\right)$
 - b. $\cos\left(\frac{17\pi}{6}\right)$
 - c. $\sin\left(\frac{25\pi}{6}\right)$
 - d. $\cos\left(\frac{19\pi}{4}\right)$

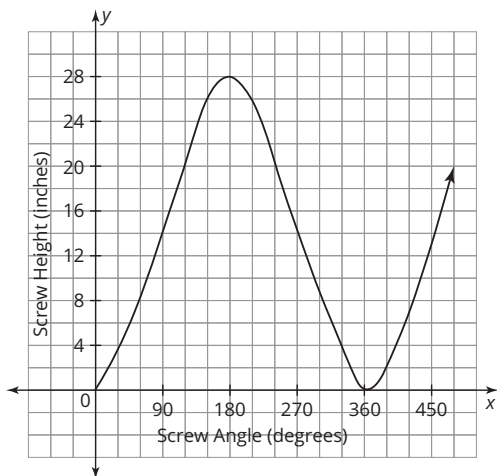
Stretch

1. Determine θ and $\sin \theta$ when $\cos\left(\frac{\theta}{2}\right) = -\frac{\sqrt{3}}{2}$. Restrict values for θ such that $0 \leq \theta \leq 2\pi$.
2. Complete the table of values for the functions shown.

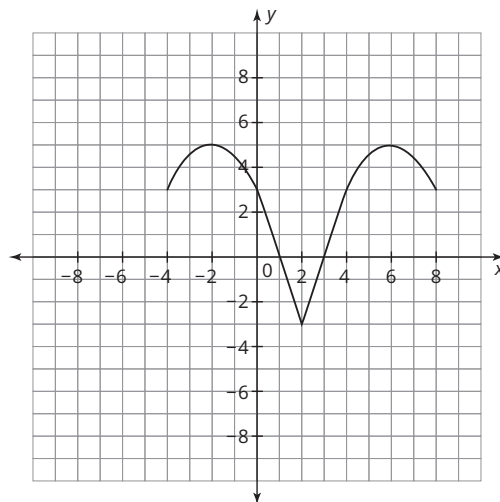
		Function			
		$\sin \theta$	$2\sin \theta$	$\sin \theta + 1$	$\sin(\theta + \pi)$
Angle Measure (θ)	0				
	$\frac{\pi}{6}$				
	$\frac{\pi}{4}$				
	$\frac{\pi}{3}$				
	$\frac{\pi}{2}$				

Review

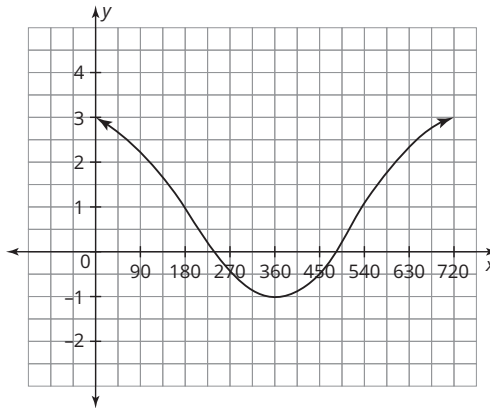
1. Ahmed is riding his bike. The tires on the bike have a diameter of 28 inches. He runs over a screw, but is able to keep riding the bike. Assume the tire rotates clockwise and the screw is at an angle of 0° when it is at ground level. The graph shows the height of the screw above the ground as a function of the angle of the screw.



- Determine the amplitude of the function.
 - Determine the period of the function.
 - Determine the height of the screw when the screw angle is 630° .
3. Write the equations of the two relations used to create this bird in terms of the function $f(x) = x^2$. Include any restrictions on the domains.



2. Consider the periodic function shown, with x in degrees.



- Determine the amplitude of the function.
- Determine the period of the function.
- Determine the value of the function when $x = 900^\circ$.