6.3 Exploring Graphs of the Primary Trigonometric Functions

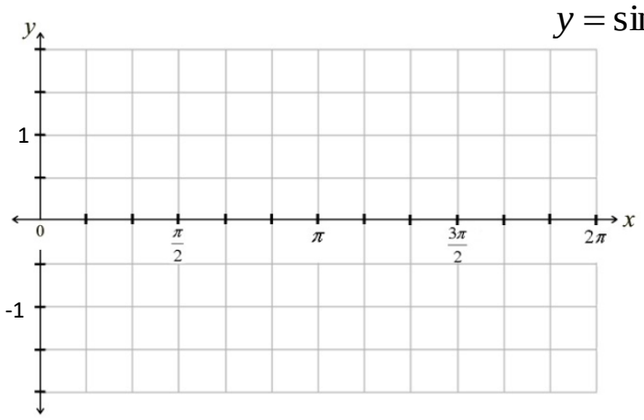
"I can use radians to graph the primary trigonometric functions.
Also, I can create formulas that describe the location of various properties of these functions, such as zeros, minimum values, maximum values, etc."

1. Complete the table, except for the last row.

x	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π	$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$	2π
$\sin x$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$		1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	$\frac{-1}{2}$		$\frac{-\sqrt{3}}{2}$	-1	$\frac{-\sqrt{3}}{2}$	$\frac{-\sqrt{2}}{2}$		0
$\cos x$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$		0	$\frac{-1}{2}$	$\frac{-\sqrt{2}}{2}$	$\frac{-\sqrt{3}}{2}$	-1	$\frac{-\sqrt{3}}{2}$		$\frac{-1}{2}$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$		1
$\frac{\sin x}{\cos x}$	0	$\frac{\sqrt{3}}{3}$	1			$-\sqrt{3}$	-1	$\frac{-\sqrt{3}}{3}$	0	$\frac{\sqrt{3}}{3}$		$\sqrt{3}$		$-\sqrt{3}$	-1		
x																	

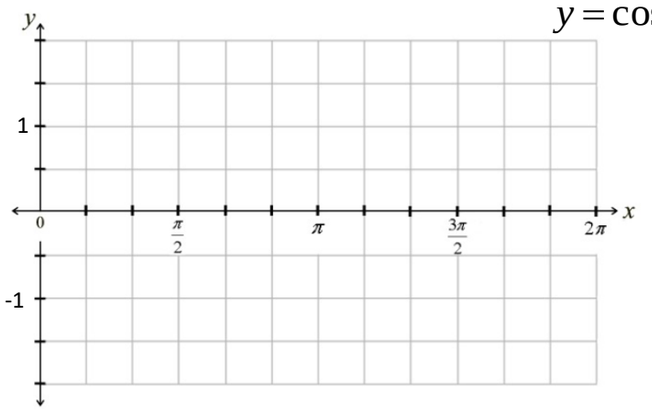
2. ***Recall***: $\tan x = \frac{\sin x}{\cos x}$. Graph all three primary trigonometric functions (increments of $\frac{\pi}{6}$ radians) on separate grids. Complete the properties in the table for each function.

$y = \sin x$



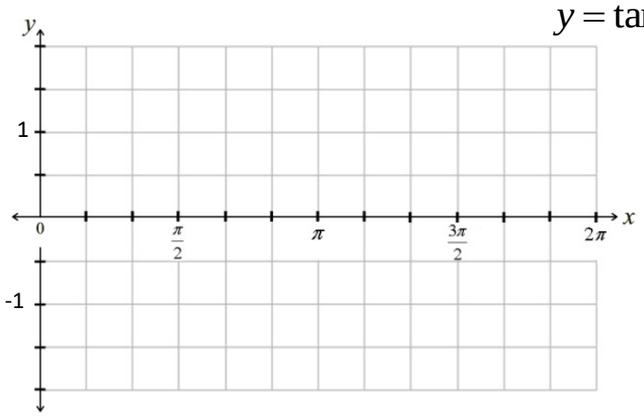
Period:
Equation of horizontal axis:
Amplitude:
Minimum Value:
Maximum Value:
Domain:
Range:
Zeros:

$y = \cos x$



Period:
Equation of horizontal axis:
Amplitude:
Minimum Value:
Maximum Value:
Domain:
Range:
Zeros:

$y = \tan x$



Period:
Equation of horizontal axis:
Amplitude:
Minimum Value:
Maximum Value:
Domain:
Range:
Zeros:
Asymptotes:

Recall:

The general term of an arithmetic sequence...

$t_n = a + (n-1)d$ where a is the first term and d is what the sequence terms increase or decrease by.

3. It is more precise to write a set of values as a formula or expression.
   For example, the set of numbers {2, 4, 6, 8, 10, ...} can be expressed as the expression $2n$, where n is an integer beginning at 1.
   Note: there are many formulas that can be found for this example!

   Let's determine some other ways…

4. Create any formula that determines all values in the Domain for $y = \tan x$.
   Note: there are many formulas that could work!

Entertainment: p. 336 #2c, 3, 5