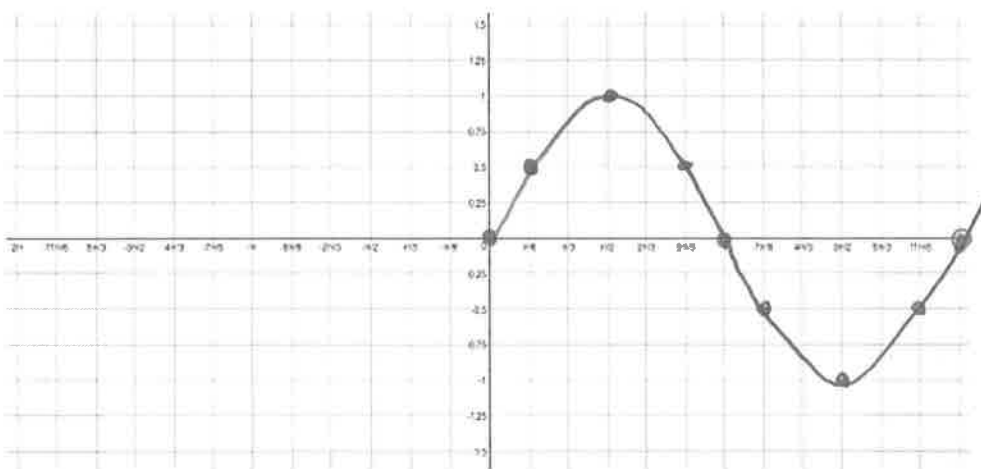


W3 – 5.1/5.2 Graphing Trig Functions

MHF4U

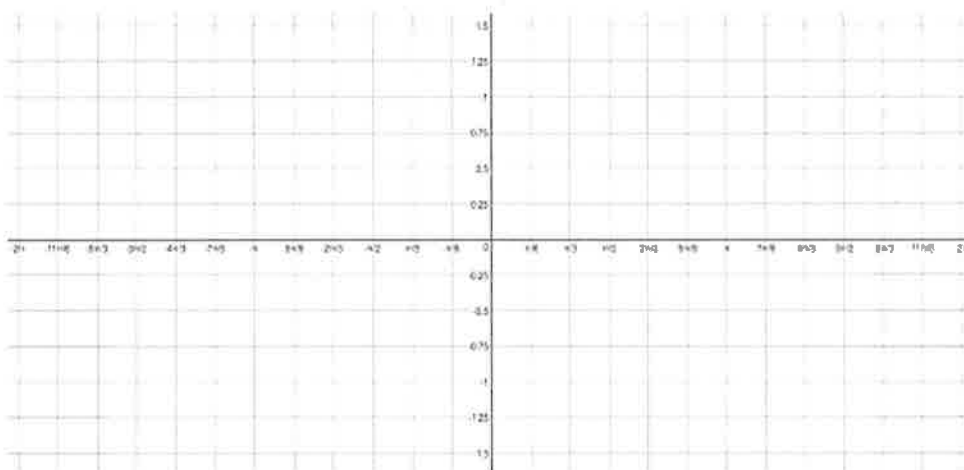
1) Complete the following table of values for the function $f(x) = \sin(x)$ and $g(x) = \csc(x)$. Use special triangles, the unit circle, or a calculator to find values for the function. Then graph both functions on the same grid. Draw asymptotes where necessary.

x	$f(x)$	$g(x)$
0	0	und.
$\frac{\pi}{6}$	$\frac{1}{2}$	2
$\frac{2\pi}{6} = \frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{2}{\sqrt{3}}$
$\frac{3\pi}{6} = \frac{\pi}{2}$	1	1
$\frac{4\pi}{6} = \frac{2\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{2}{\sqrt{3}}$
$\frac{5\pi}{6}$	$\frac{1}{2}$	2
$\frac{6\pi}{6} = \pi$	0	und.
$\frac{7\pi}{6}$	$-\frac{1}{2}$	-2
$\frac{8\pi}{6} = \frac{4\pi}{3}$	$-\frac{\sqrt{3}}{2}$	$-\frac{2}{\sqrt{3}}$
$\frac{9\pi}{6} = \frac{3\pi}{2}$	-1	-1
$\frac{10\pi}{6} = \frac{5\pi}{3}$	$-\frac{\sqrt{3}}{2}$	$-\frac{2}{\sqrt{3}}$
$\frac{11\pi}{6}$	$-\frac{1}{2}$	-2
$\frac{12\pi}{6} = 2\pi$	0	und.



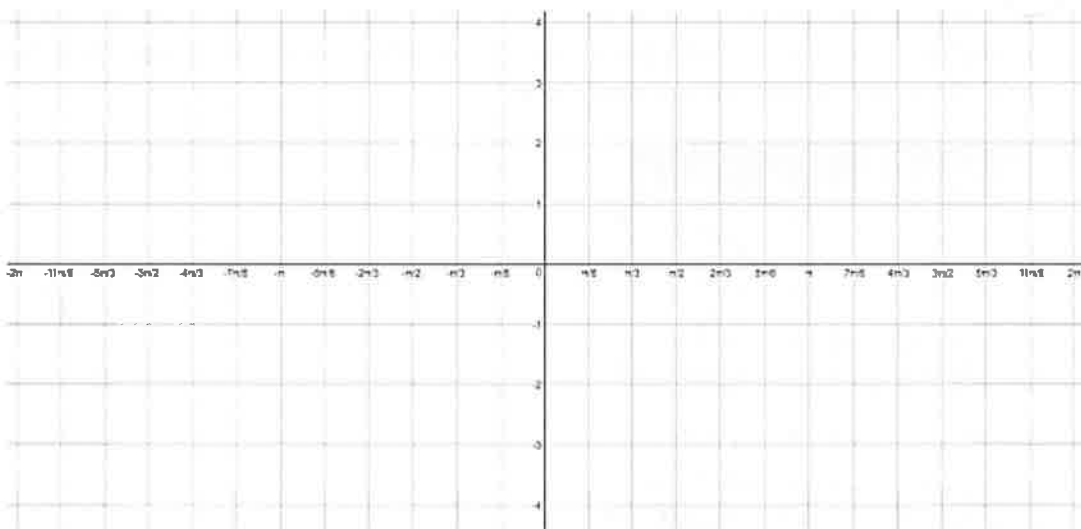
2) Complete the following table of values for the function $f(x) = \cos(x)$ and $g(x) = \sec(x)$. Use special triangles, the unit circle, or a calculator to find values for the function. Then graph both functions on the same grid. Draw asymptotes where necessary.

x	$f(x)$	$g(x)$
0		
$\frac{\pi}{6}$		
$\frac{2\pi}{6} = \frac{\pi}{3}$		
$\frac{3\pi}{6} = \frac{\pi}{2}$		
$\frac{4\pi}{6} = \frac{2\pi}{3}$		
$\frac{5\pi}{6}$		
$\frac{6\pi}{6} = \pi$		
$\frac{7\pi}{6}$		
$\frac{8\pi}{6} = \frac{4\pi}{3}$		
$\frac{9\pi}{6} = \frac{3\pi}{2}$		
$\frac{10\pi}{6} = \frac{5\pi}{3}$		
$\frac{11\pi}{6}$		
$\frac{12\pi}{6} = 2\pi$		



3) Complete the following table of values for the function $f(x) = \tan(x)$. Use the quotient identity to find y -values.

x	$f(x)$
0	
$\frac{\pi}{6}$	
$\frac{2\pi}{6} = \frac{\pi}{3}$	
$\frac{3\pi}{6} = \frac{\pi}{2}$	
$\frac{4\pi}{6} = \frac{2\pi}{3}$	
$\frac{5\pi}{6}$	
$\frac{6\pi}{6} = \pi$	
$\frac{7\pi}{6}$	
$\frac{8\pi}{6} = \frac{4\pi}{3}$	
$\frac{9\pi}{6} = \frac{3\pi}{2}$	
$\frac{10\pi}{6} = \frac{5\pi}{3}$	
$\frac{11\pi}{6}$	
$\frac{12\pi}{6} = 2\pi$	



4) A lighthouse with a rotating beam is located 1200 meters south of a coastal cliff that runs west to east.

a) Determine a relation for the distance from the lighthouse to the point where the light strikes the cliff in terms of the angle of rotation x .

b) Determine an exact expression for this distance when $x = \frac{7\pi}{12}$

5) A variant on the carousel at a theme park is the swing ride. Swings are suspended from a rotating platform and move outward to form an angle x with the vertical as the ride rotates. The angle is related to the radial distance, r , in meters, from the center of rotation; the acceleration, $g = 9.8 \text{ m/s}^2$, due to gravity; and the speed, v , in meters per second, of the swing, according to the formula

$$\cot x = \frac{rg}{v^2}$$



Determine the angle x for a swing located 3.5 meters from the center of rotations and moving at 5.4 m/s, to the nearest hundredth of a radian.

Explain the difference between $\csc \frac{1}{\sqrt{2}}$ and $\sin^{-1} \left(\frac{1}{\sqrt{2}} \right)$

Answer Key

See posted solutions for #1-3

4)a) $d = 1200 \sec x$ b) $\frac{2400\sqrt{2}}{1-\sqrt{3}}$

5) 0.70

b) The cosecant function is the reciprocal of the sine function. For \sin^{-1} , the -1 is NOT an exponent but instead a notation meaning the opposite operation of sine. The sine function takes an angle for an input and gives a ratio as an output. \sin^{-1} takes a ratio for an input and gives the angle as an output.