

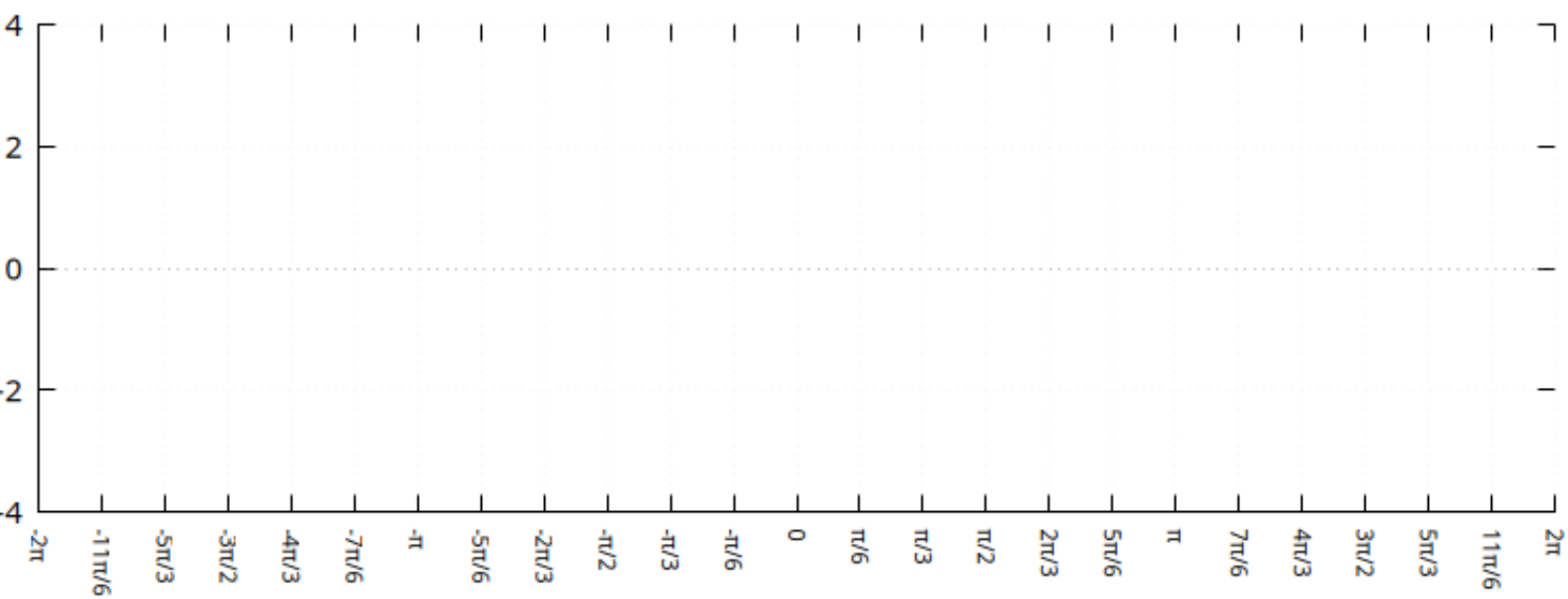
5.1/5.2 Graphing Trig Functions Worksheet

This document was composed and formatted by Annie Bernatchez.

The course material originated from www.jensenmath.ca

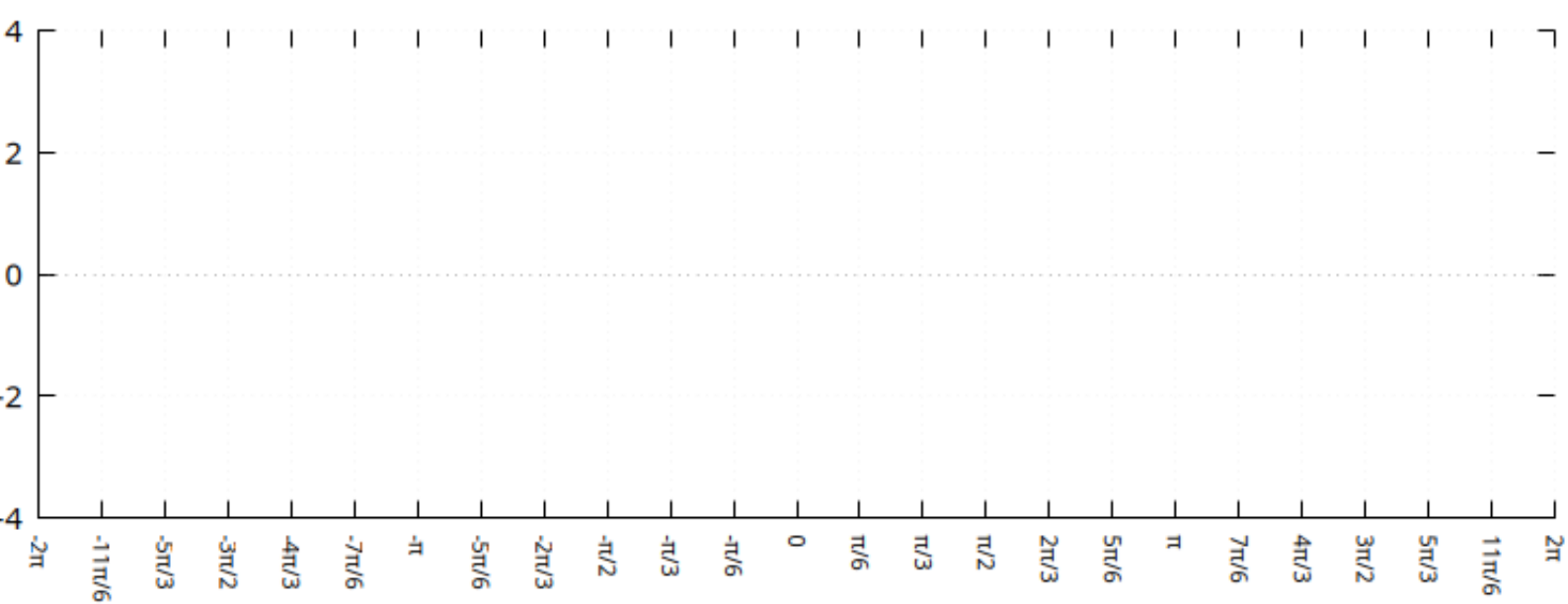
1) Complete the following table of values for the function $f(x) = \sin(x)$ and $g(x) = \csc(x)$. Use special triangles, the unit circle, or a calculator to find values for the function. Then graph both functions on the same grid. Draw asymptotes where necessary.

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



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.

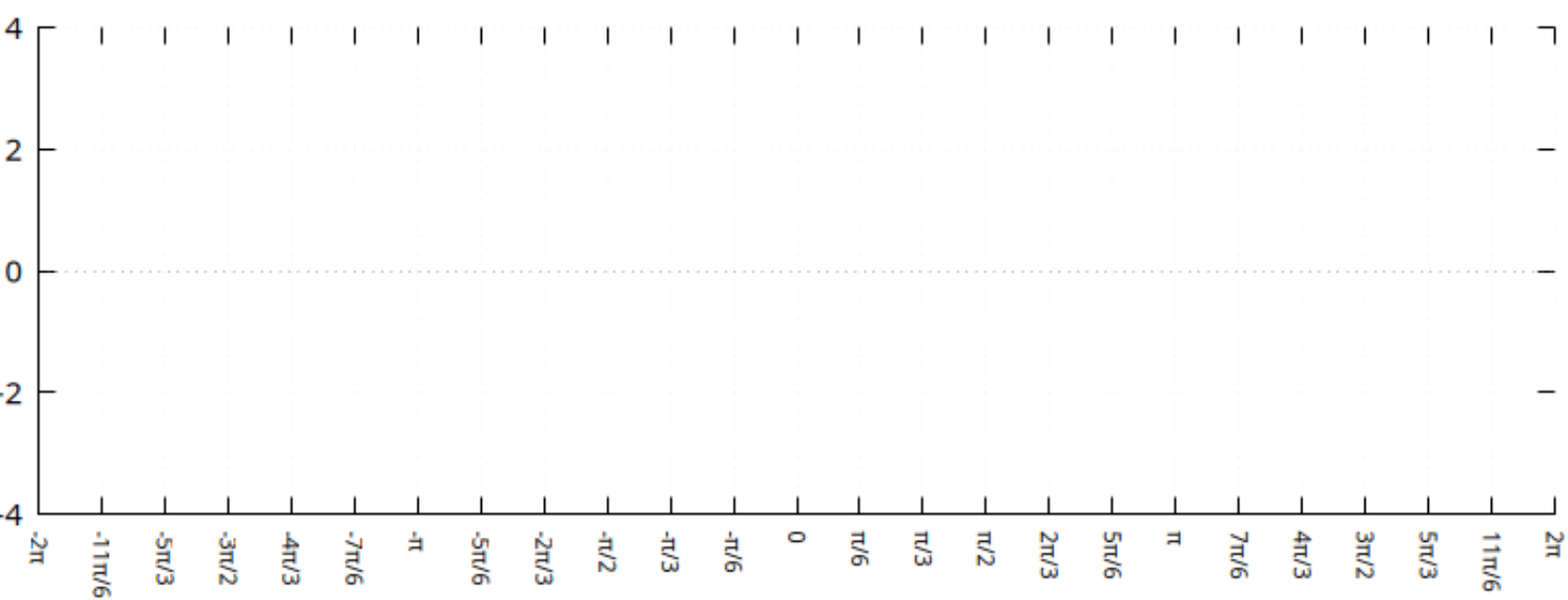
x	$f(x)$	$g(x)$
0		
$\frac{\pi}{6}$		
$\frac{2\pi}{6} = \frac{\pi}{3}$		
$\frac{3\pi}{6} = \frac{\pi}{2}$		
$\frac{4\pi}{6} = \frac{2\pi}{3}$		
$\frac{5\pi}{6}$		
$\frac{6\pi}{6} = \pi$		
$\frac{7\pi}{6}$		
$\frac{8\pi}{6} = \frac{4\pi}{3}$		
$\frac{9\pi}{6} = \frac{3\pi}{2}$		
$\frac{10\pi}{6} = \frac{5\pi}{3}$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



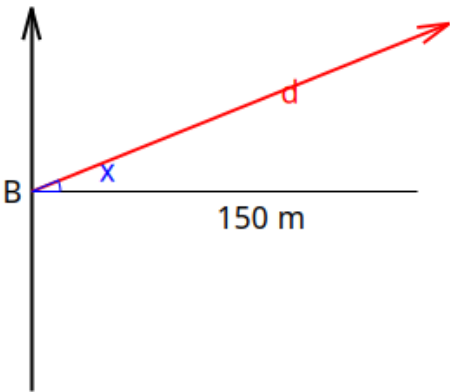
3) Complete the following table of values for the function $f(x) = \tan(x)$. Use the quotient identity to find y -values.

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 boat is in the water 150 meters from a straight shoreline. There is a rotating beam on the boat.



a) Determine a reciprocal trigonometric relation for the distance, d , from the boat to where the light hits the shoreline in terms of the angle of rotation x .

b) Determine an exact expression for the distance when $x = \frac{\pi}{6}$

c) Determine an approximate value, to the nearest tenth of a meter, for the distance.

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 rotation and moving at 5.4 m/s, to the nearest hundredth of a radian.

6) 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) $d = 150 \sec x$ b) $\frac{300}{\sqrt{3}} \text{ m}$ c) 173.2 m

5) 0.70

6) 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.