Trig Review Packet

Name:_____

C Level: NO CALC

1. Consider the trigonometric function (in radians) $f(x) = 7\ sin(4x) - 11$.

   a. What is the Amplitude of the function?

   7

   b. What is the period of the function (in radians)? Explain how you know.

   $\frac{2\pi}{4} = \frac{\pi}{2}$. Cycles 4 times as fast as parent.

   c. What is the midline of the function?

   -11

   d. What is the range of the function? ($\# \le y \le \#$)

   $-11-7=-18$ $-11+7=-4$ $-18 \le y \le -4$

2. Consider the trigonometric function (in degrees) g(x) = -2cos(6x) + 3

   a. What is the Amplitude of the function?

   2

   b. What is the period of the function (in degrees)? Explain how you know.

   $\frac{360^\circ}{6} = 60^\circ$. Cycles 6 times as fast as parent.

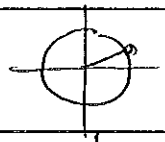
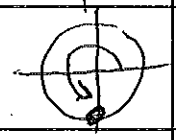
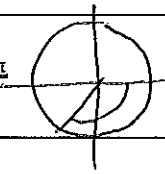
   c. What is the midline of the function?

   3

   d. What is the range of the function? ($\# \le y \le \#$)

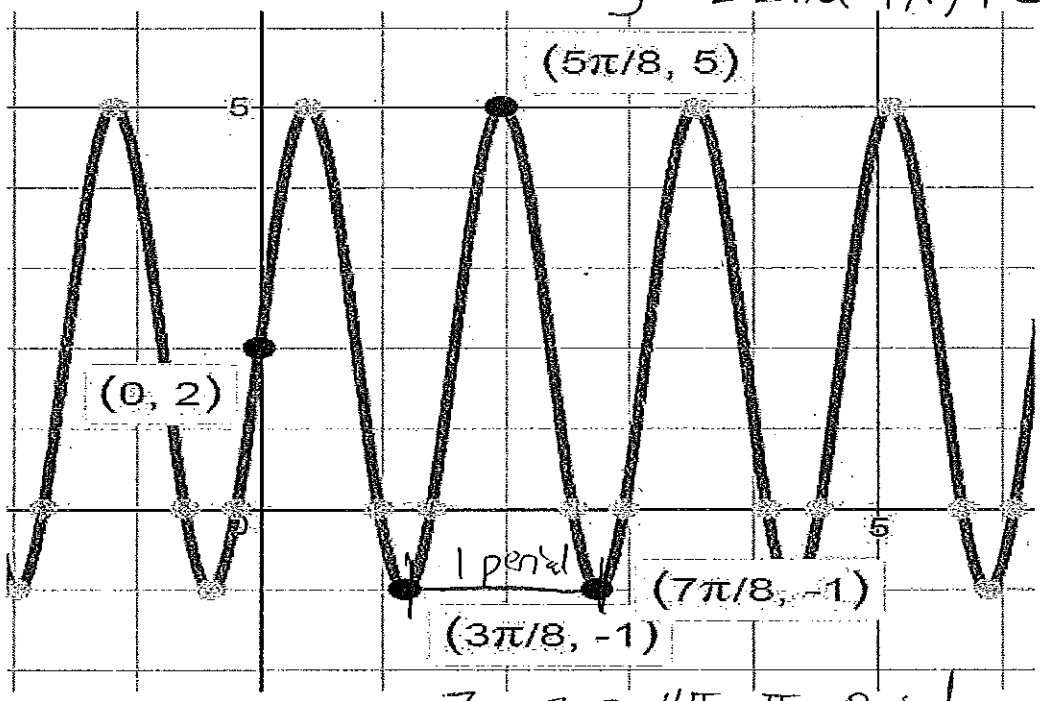
   $3-2=1$ $3+2=5$ $1 \le y \le 5$.

3. Use the Unit Circle to complete the table:

Number of radians of rotation, θ	Quadrant/Axis	Measure of Reference Angle, in radians	$\cos(\theta)$	$\sin(\theta)$	$\tan(\theta)$
$\frac{\pi}{6}$ 	I	$\pi/6$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$
$\frac{3\pi}{2}$ 	y-	$\pi/2$	0	-1	$\frac{-1}{0}$ DNE
$\frac{21\pi}{6} = \frac{7\pi}{2}$	y+	$\pi/2$	0	-1	$\frac{-1}{0}$ DNE
$-\frac{2\pi}{3}$ 	III	$\pi/3$	$-1/2$	$-\frac{\sqrt{3}}{2}$	$\sqrt{3}$

4. Find an equation (in radians) of the function shown: $y = \#\sin(\#x) + \#$

$y = 3\sin(4x) + 2$



$\frac{7\pi}{8} - \frac{3\pi}{8} = \frac{4\pi}{8} = \frac{\pi}{2}$ = Period

$\frac{2\pi}{b}$ = period

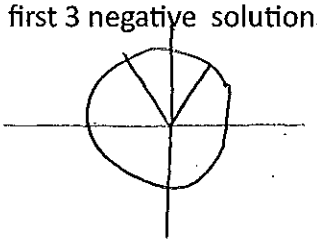
$\frac{2\pi}{b} = \frac{\pi}{2}$

$2\pi = \frac{\pi}{2} \cdot b$

$4 = b$

A/B Level Questions: NO CALC

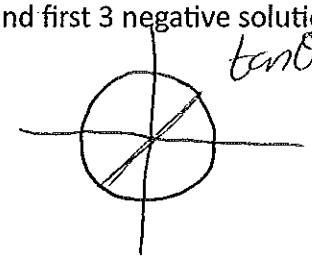
5. Suppose θ represents a number of radians of rotation. Use the unit circle to find the first 3 positive and first 3 negative solutions to the equation $sin(\theta) = \frac{1}{2}$. Explain how you found your answers.



$\theta_+ = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{7\pi}{3}$ ← I added 2π to $\frac{\pi}{3}$ so I would be back at $\sin(\theta)=\frac{1}{2}$.

$\theta_- = -\frac{4\pi}{3}, -\frac{5\pi}{3}, -\frac{10\pi}{3}$ ← I subtracted 2π from $-\frac{4\pi}{3}$.

6. Suppose θ represents a number of degrees of rotation. Use the unit circle to find the first 3 positive and first 3 negative solutions to the equation $tan(\theta) = 1$. Explain how you found your answers



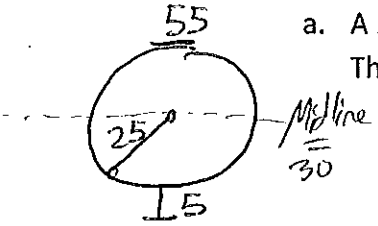
tanθ = slope.

$\theta_+ = 45°, 225°, 405°$ Add/subtract 180°.

$\theta_- = -135°, -315°, -495°$

7. Use the Amplitude, Frequency, Horizontal shift and midline to write an equation for each function described below:

a. A Ferris wheel completes a rotation in 720 seconds and has a radius of 25 meters. The lowest point on the Ferris wheel is 5 meters above the ground -- in degrees.

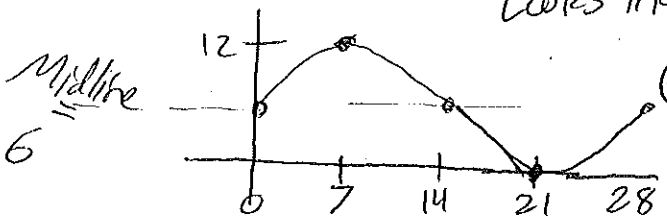


$25\sin(\frac{x}{2})+30$

$\frac{360°}{720 \text{ seconds}} = \frac{1}{2}°$ per second

b. A trig function has its first positive maximum at (7, 12); first positive minimum at (21,0) -- use radians.

Looks like sine..

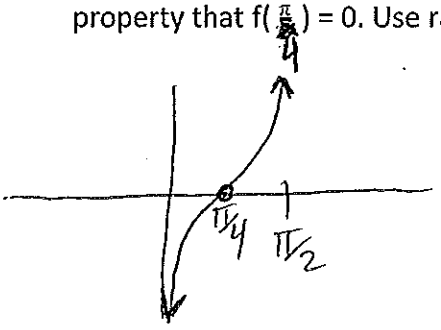


$28 = \frac{2\pi}{b}$

$b = \frac{2\pi}{28} = \frac{\pi}{14}$

$6\sin(\frac{\pi}{14}x)+6$

c. A trig function has a vertical asymptote at every multiple of $\frac{\pi}{2}$. It also has the property that $f(\frac{\pi}{4}) = 0$. Use radians.

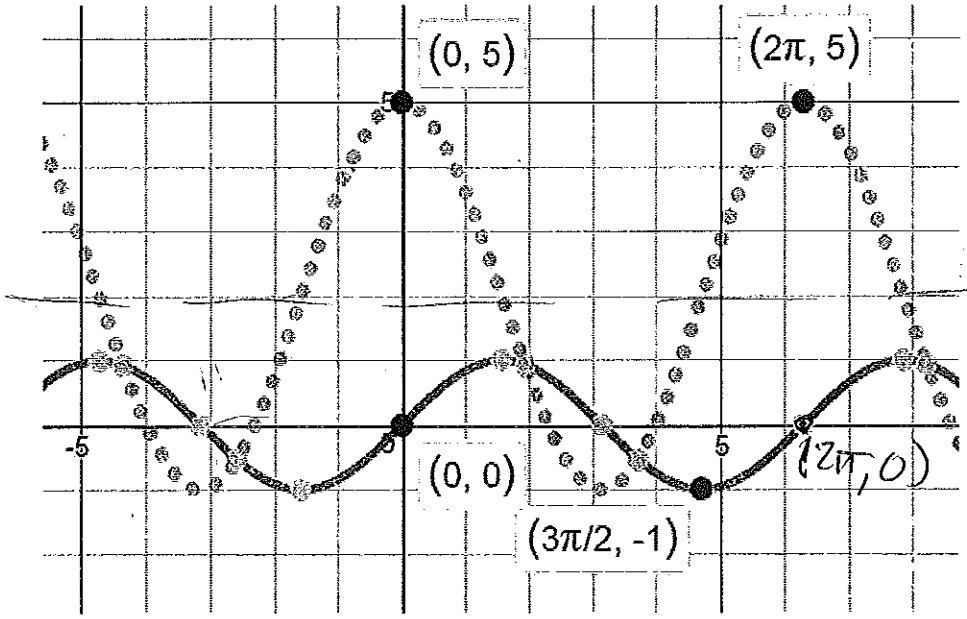


$\tan(2(x-\pi/4))$

8. The solid graph is sinx.

a. Find a, b, h, k, so that f(x) = asin(b(x-h))+k is the dotted graph

b. Find a, b, h, k, so that g(x) = acos(b(x-h))+k is the dotted graph



Amplitude = 3
Midline = 2
Period = 2π

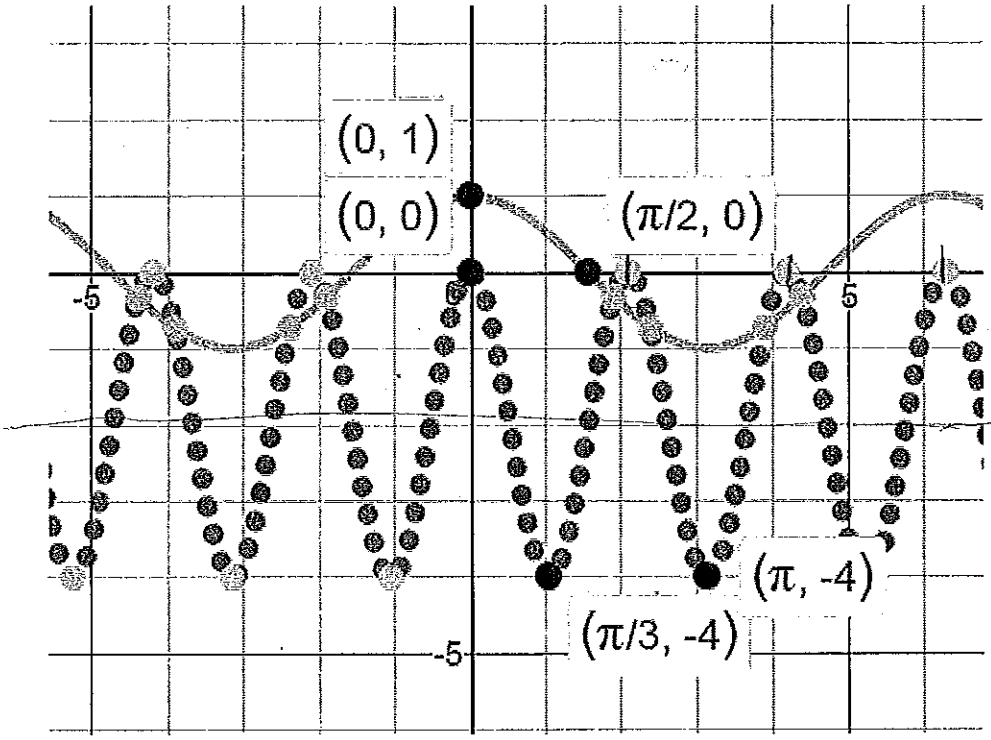
a) 3 sin(π/2 − x) + 2

b) 3cos(x) + 2

9. The solid graph is cosx.

a. Find a, b, h, k, so that f(x) = asin(b(x-h))+k is the dotted graph

b. Find a, b, h, k, so that g(x) = acos(b(x-h))+k is the dotted graph



Amplitude = 2
Midline = −2
Period = 2π/3

a) 2 sin(π/2 − 3x) − 2

b) 2 cos(3x) − 2