TRIGONOMETRIC FUNCTIONS

Name:	
Date:	
My Achievement Goal for this chapter is… (Circle one) A+ A B C D	
This Assignment is:	
Good to Go	Needs Corrections

Please answer all questions on this sheet and remember to show all your work!

1. For each of the given angles, answer the following:
   a. Find one positive and one negative coterminal angles of $300°$ in degrees.

   b. Find one positive and one negative coterminal angles of $\frac{5\pi}{6}$ in radians.

2. Find the length of an arc of a circle with radius 12 cm if the arc subtends a central angle of $60°$.

3. Using special triangles, find the exact values.
   a. $\sec\frac{\pi}{4}$

   b. $\csc\frac{7\pi}{6}$

c. $\tan \pi$

d. $\sin \frac{4\pi}{3}$

4. Given that $\cos \theta = \frac{1}{\sqrt{2}}$, and $-180° \leq \theta \leq 0°$, determine possible coordinates for point P on the terminal arm of θ.

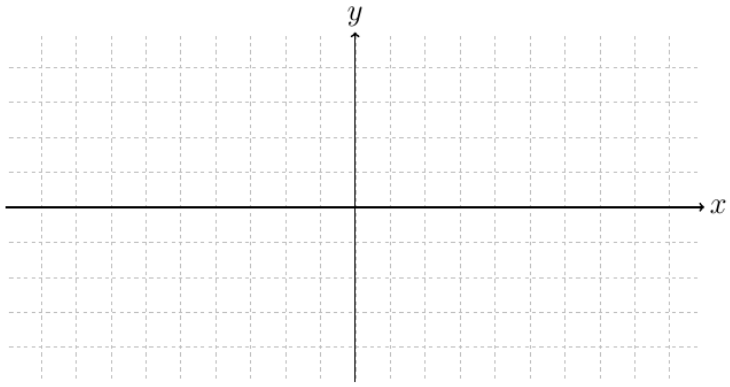
5. If $\cos \theta$ has a negative value and $\tan \theta$ has a positive value, find a and b such that
$$0 < a < \theta < b. < 360°.$$

6. Let $g(x) = -3\sin\left[\frac{2\pi}{15}(x-3)\right] + 1$.
   a. State the amplitude, vertical displacement, period, and the phase shift.

   b. State the formula for the maximum and minimum value of $g(x)$.

   c. Find the maximum and minimum value of $g(x)$.

d. Sketch $g(x)$. Show at least two periods.



e. State the domain and range of $g(x)$.

f. Find an equivalent function using cosine.

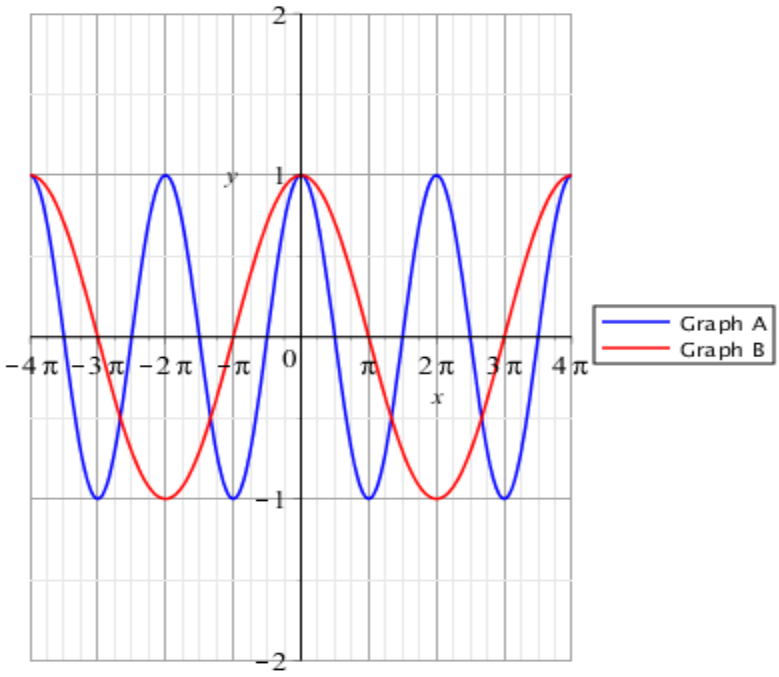
7. If $f(\theta) = \tan\theta$ is transformed to $g(\theta) = a\tan[b(\theta - c)] + d$ by a vertical compression by a factor of $\frac{1}{2}$, Horizontally expanded by a factor of 4, then translated π units right and 1 unit down.
   a. What is $g(\theta)$?

   b. It is known that the point $P\left(\frac{\pi}{4}, 1\right)$ is on $f(\theta)$. What is the image of P under the given transformations?

   c. What are the equations of the asymptotes for the function $g(\theta)$ for all θ?

   d. State the period of $g(\theta)$.

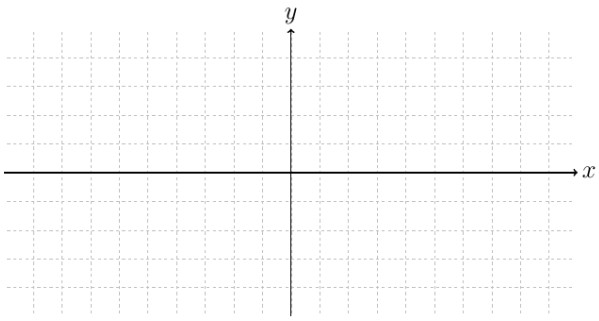
8. The graphs of two cosine functions are shown below:



If graph B was obtained from graph A, what is the equation of graph B? (Hint: You may define graph A= $f(x)$ and graph B= $g(x)$.)

9. A Ferris wheel has a radius of 30 m. Its center is at 32 m above the ground. It rotates once every 15 s. Suppose you get on the bottom at $t = 0$. Write an equation that expresses your height as a function of elapsed time.

   a. Sketch a graph of the height as you ride the wheel.



   b. Write an equation using sine and another equation using cosine.