Activity 4  
Math 112  

Lecture Time: 10:00  12:00  2:00  
Recitation Time:  

1. Sketch a graph of \( f(x) = -3\sin(2x + \frac{\pi}{2}) + 1 \). Check your graph by plotting \( f(x) \) on a calculator.  

2. Graph \( y = \tan(2x + \frac{\pi}{4}) - 1 \). Check your graph with a calculator.  

3. Solve the triangle (find the values of all variables).  

![Diagram of a triangle with sides labeled as follows: \(\beta\), \(a\), \(b\), and \(g\). The side opposite \(\beta\) is labeled \(41\). The base \(b\) is opposite \(\alpha\).]
4. Consider the function $f(x)$ graphed below.

![Graph of $f(x)$]

a. Find a formula for this function of the form $f(x) = a \cos[b(x - c)] + d$

b. Find a formula for this function of the form $f(x) = a \sin[b(s - c)] + d$

5. Suppose that $\theta$ is an acute angle and $\theta = \cos^{-1} \left( \frac{1}{x} \right)$. Find an expression for $\tan \theta$ in terms of $x$. Hint: Place $\theta$ in a right triangle. What must the side lengths of this triangle be (in terms of $x$)?