Review Chapter 5

1. Convert $132°52'41''$ to decimal degrees

2. Without using a calculator, evaluate the followings:

   a. $\arccos 1$

   b. $\arcsin \frac{\sqrt{2}}{2}$

   c. $\arctan \sqrt{3}$

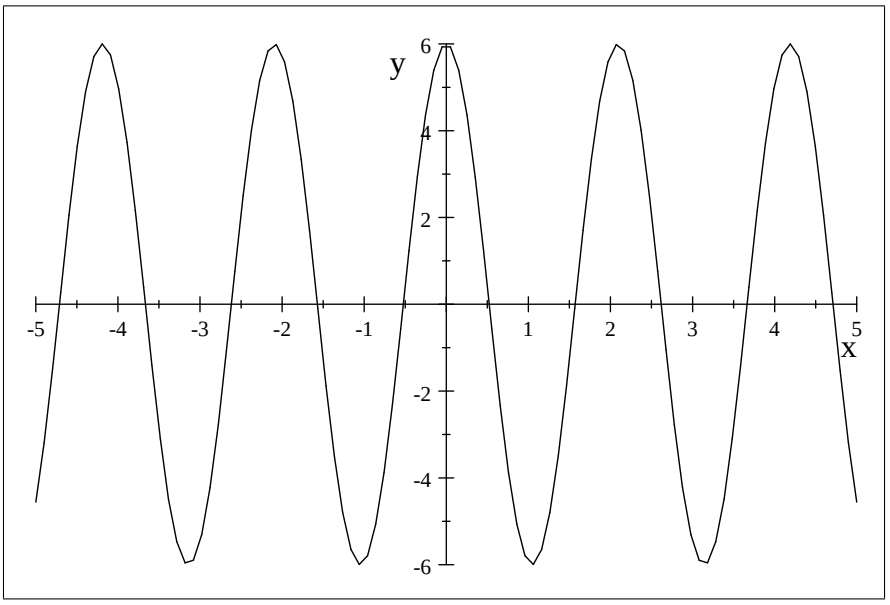
   d. $\csc(\arctan(-1))$

3. Sketch the graph of the function

$$f(x) = -2\cos(\pi x).$$

4. The equation of the graph below is of the form

$$f(x) = A\cos Bx.$$



   a. What is the maximum value obtained by f

   b. What is the period of the function f

   c. Find A, and B

5. Without a calculator, sketch the graph of

$$g(x) = -\sin\left(\frac{x}{2} + \frac{\pi}{2}\right) + \frac{\pi}{3}.$$

6. Given the function

$$g(x) = -2\cos\left[-\frac{\pi}{2}x - \frac{\pi}{4}\right]$$

   Find the amplitude, the period and the phase shift of the harmonic function g.

7. Determine if the following functions are odd or even

   a.
   $$h(x) = \frac{2\sin^2(x)}{\cos(2x)\sin(2x)}.$$

   b.
   $$p(x) = \frac{x^2\cos^2(x)}{\tan(x)\sin(2x)}.$$

   c. Use your graphing calculator to plot the functions above and confirm your answers

8. (Similar to webwork problems) A wheel centered at the point $(-4, 5)$ of radius $\sqrt{3}$ is rotating counterclockwise. Let θ be the angle corresponding to a point p located on the wheel,

   a. Write the yy-coordinate of the point p as a function of θ for $0 \leq \theta \leq \frac{\pi}{2}$.

   b. Write the x-coordinate of the point p as a function of θ for $0 \leq \theta \leq \frac{\pi}{2}$.

9. Solve the equation
   $$\cos x = -\frac{1}{2}.$$

10. Solve the equation
    $$\csc x = -\sqrt{2}.$$

11. Find the perimeter of a square inscribed in circle of radius 100.

12. A wind turbine of rotor diameter 40 $feet$ makes 80 revolutions per minute. Find the angular speed and the linear speed of the rotor tip.

13. Prove the identity
    $$\sin(-\theta)\sec(-\theta)\cot(-\theta) = 1.$$