SECTION 3.3 DERIVATIVES OF TRIGONOMETRIC FUNCTIONS

1. Pull out a calculator and complete the charts below:

   (a) The variable θ is in **degrees**.

θ	0	0.001	0.01	0.1
$\frac{\sin(\theta)}{\theta}$				

   (b) The variable θ is in **radians**.

θ	0	0.001	0.01	0.1
$\frac{\sin(\theta)}{\theta}$				

   (c) The variable θ is in **radians**.

θ	0	0.001	0.01	0.1
$\frac{1-\cos(\theta)}{\theta}$				

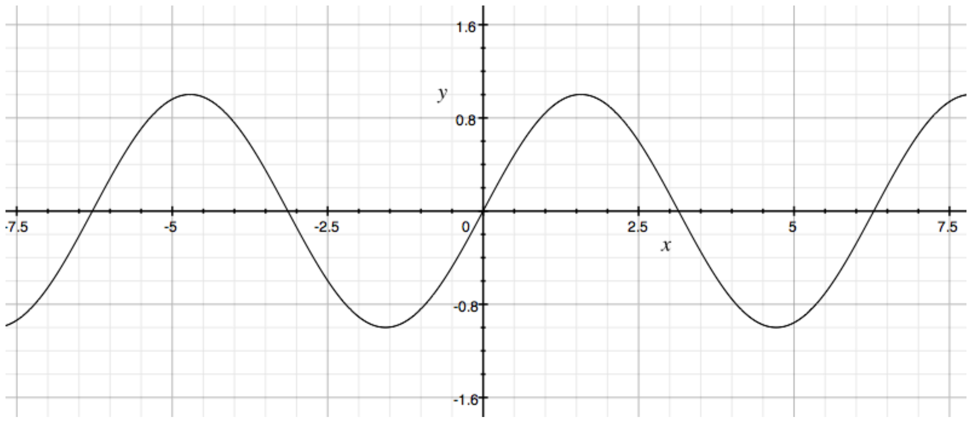
2. Based on the tables above, what would you conclude about:

   (a) $\lim\limits_{\theta \to 0} \dfrac{\sin(\theta)}{\theta}$

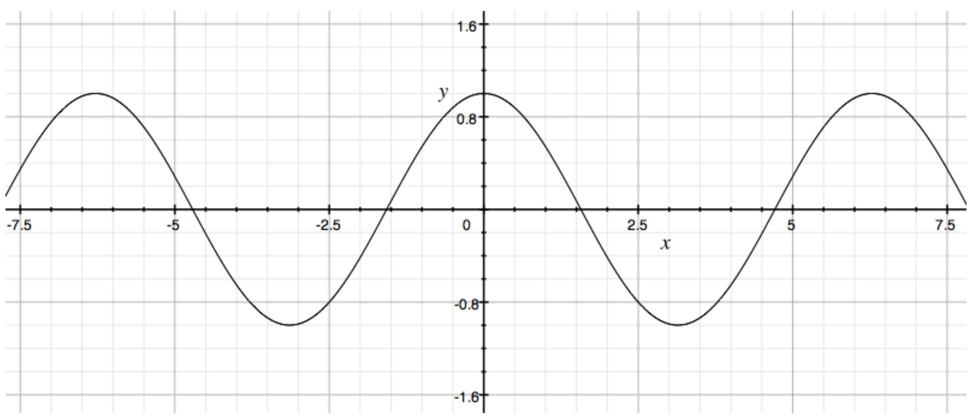
   (b) $\lim\limits_{\theta \to 0} \dfrac{1-\cos(\theta)}{\theta}$

3. Use the definition of the derivative to find the derivative of $y = \sin(x)$ assuming x is measured in radians.

4. Use the graph of $y = \sin x$ to sketch a graph of y'. Does this fit with our calculation on the previous page? Why?



5. Use the graph of $y = \cos x$ to sketch a graph of y'. What would you guess y' to be and why?



6. Use what we learned in 4. and 5. above to find the derivative of:

   (a) $y = 3x^4 \cos(x)$

   (b) $y = \csc(x)$ (Use the Quotient Rule.)