Honors Precalculus

**For functions involving trig, make sure your graphing calculator is in RADIAN mode!

Limits: A Numerical and Graphical Approach

1. Use your graphing calculator to graph $f(x) = \dfrac{\cos x}{x^2}$. Make a guess as to the value of $\lim_{x \to 0} \dfrac{\cos x}{x^2}$. Construct a table of values for $f(-.1), f(-.01), f(-.001), f(-.0001), f(.1), f(.01), f(.001), f(.0001)$. Estimate $\lim_{x \to 0} \dfrac{\cos x}{x^2}$.

x					0				
$f(x)$									

2. Graph $f(x) = x\dfrac{|x-1|}{x-1}$. What is the $\lim_{x \to 1+} f(x)$ and $\lim_{x \to 1-} f(x)$? Construct a table of values for $f(.9), f(.99), f(.999), f(1.001), f(1.01), f(1.1)$. What is the $\lim_{x \to 1+} f(x)$ and $\lim_{x \to 1-} f(x)$?

x			1		
$f(x)$					

3. Using a graphing calculator, graph $f(x) = \sin \dfrac{1}{x}$. Does if look as if $\lim\limits_{x \to 0} f(x)$ exists? Construct a table of values for $f(-.1), f(-.01), f(-.001), f(-.0001), f(.1), f(.01), f(.001), f(.0001)$. What do you conclude about $\lim\limits_{x \to 0} f(x)$?

x								
$f(x)$								
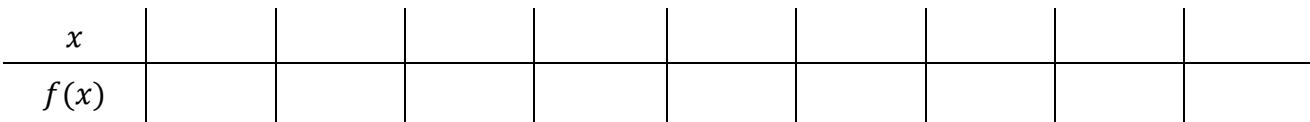
4. Using a graphing calculator, graph $f(x) = \dfrac{\sin x}{x}$. Make a guess as to the $\lim\limits_{x \to 0} f(x)$. Construct a table of values for $f(-.1), f(-.01), f(-.001), f(-.0001), f(.1), f(.01), f(.001), f(.0001)$. Estimate $\lim\limits_{x \to 0} f(x)$.

x								
$f(x)$								