Calculus Homework #1

1) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 2}\frac{x-2}{x^2-x-2}$, if it exists.

2) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to -2}\frac{x-2}{x^2-4}$, if it exists.

3) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 0}\frac{\sqrt{x+3}-\sqrt{3}}{x}$, if it exists.

4) Find L, the $\lim_{x\to 2}(x+3)$, and then use the definition of a limit to prove that the limit is L.

5) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 3}\frac{\frac{1}{x+1}-\frac{1}{4}}{x-3}$, if it exists.

6) Find L, the $\lim_{x\to 2}(3x+2)$, and then find $\delta>0$ such that $|f(x)-L|<.01$ whenever $0<|x-a|<\delta$

7) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 0}\frac{\sin x}{x}$, if it exists.

8) Find L, the $\lim_{x\to 4}(-3x+4)$, and then use the definition of a limit to prove that the limit is L.

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9) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 0}\frac{\cos x-1}{x}$, if it exists.

10) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 3}(4-x)$, if it exists.

11) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 2} f(x)$ if $f(x)=\begin{cases}3-2x & x\neq 2\\ 4 & x=2\end{cases}$, if it exists.

12) Find L, the $\lim_{x\to 0}\sqrt[3]{x}$, and then use the definition of a limit to prove that the limit is L.

13) Find L, the $\lim_{x\to 2}(x^2-3)$, and then find $\delta>0$ such that $|f(x)-L|<.01$ whenever $0<|x-a|<\delta$

14) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 5}\frac{|x-5|}{x-5}$, if it exists.

15) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 3}\frac{1}{x-3}$, if it exists.

16) Find L, the $\lim_{x\to 1}(x^2+1)$, and then use the definition of a limit to prove that the limit is L.

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17) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to\frac{\pi}{2}} \tan x$, if it exists.

18) Graph, and then use the graph, along with a detailed table of values, to find $\lim_{x\to 0} \cos(\frac{1}{x})$, if it exists.

19) Find L, the $\lim_{x\to 4}(4-\frac{x}{2})$, and then find $\delta > 0$ such that $|f(x)-L|<.01$ whenever $0<|x-a|<\delta$

20) Find L, the $\lim_{x\to -3}(2x+5)$, and then use the definition of a limit to prove that the limit is L.