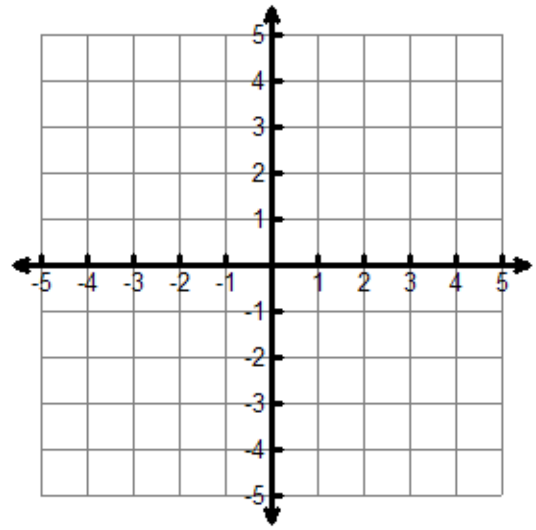
Calculus 1.1 Practice #3 Name: ______________________ Date__________

Understanding Limits Numerically and Graphically

Use the given function to find the indicated limits, or state that the limit does not exist. Verify your answers graphically.

1. $f(x)=\begin{cases}(x+2)^2 & \text{when } x<0\\ -\sqrt{x}+4 & \text{when } x\ge 0\end{cases}$

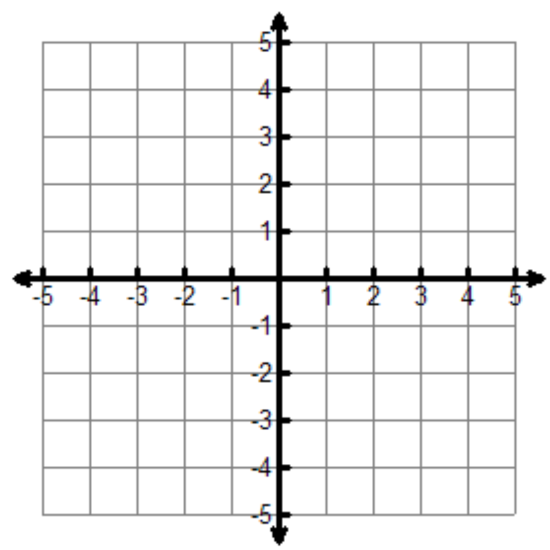


a. $\lim\limits_{x\to 0^-} f(x)$

b. $\lim\limits_{x\to 0^+} f(x)$

c. $\lim\limits_{x\to 0} f(x)$

2. $f(x)=\begin{cases}x^2-4 & x\le 2\\ x-3 & x>2\end{cases}$



a. $\lim\limits_{x\to 2^-} f(x)$

b. $\lim\limits_{x\to 2^+} f(x)$

c. $\lim\limits_{x\to 2} f(x)$

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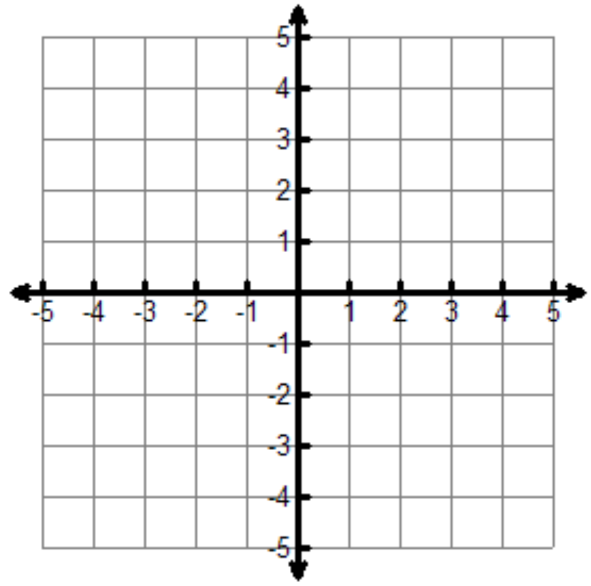
3. $f(x) = \begin{cases} -x & x < 1 \\ 1 & x = 1 \\ x^2 + 1 & x > 1 \end{cases}$

a. $\lim\limits_{x \to 1^-} f(x)$

b. $\lim\limits_{x \to 1^+} f(x)$

c. $\lim\limits_{x \to 1} f(x)$



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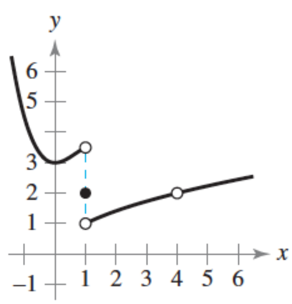
There are no great limits to growth because there are no limits of human intelligence, imagination, and wonder.
– Ronald Reagan

Answer the following questions. You may use a graphing calculator to assist you.

1	For the function $f(x)=5x^2$, as the x-value gets closer and closer to 3, $f(x)$ gets closer and closer to what value?
2	For the function $f(x)=\dfrac{x^2-4}{x-2}$, as the x-value gets closer and closer to 2, $f(x)$ gets closer and closer to what value?
3	For the function $f(x)=e^x+1$, as the x-value gets closer and closer to 0, $f(x)$ gets closer and closer to what value?
	The graph of $f(x)$ is given below, use the graph to answer the following questions.  **4)** a) $\lim_{x\to 4^-} f(x)$ b) $\lim_{x\to 4^+} f(x)$ c) $\lim_{x\to 4} f(x)$ d) $f(4)$ **5)** a) $\lim_{x\to 1^-} f(x)$ b) $\lim_{x\to 1^+} f(x)$ c) $\lim_{x\to 1} f(x)$ d) $f(1)$
7	Simplify $\dfrac{x^2+7x+12}{x^2-16}$