Calculus 12
2-6 Questions

1. Find the following limits, if they exist.

a) $\lim_{x \to 0^+} \sqrt[4]{x}$

b) $\lim_{x \to 3^+} \sqrt{x-3}$

c) $\lim_{x \to 1^-} \sqrt{1-x}$

d) $\lim_{x \to \frac{1}{2}^-} \sqrt[4]{1-2x}$

e) $\lim_{x \to 6^+} |x-6|$

f) $\lim_{x \to 6^-} |x-6|$

g) $\lim_{x \to 6} |x-6|$

h) $\lim_{x \to 0^+} \frac{|x|}{x}$

i) $\lim_{x \to 0^-} \frac{|x|}{x}$

j) $\lim_{x \to 0} \frac{|x|}{x}$

2. Let $f(x) = \begin{cases} -1 & if \ \ x < 0 \\ x+1 & if \ \ x \geq 0 \end{cases}$

Find the following limits, if they exist. Then sketch the graph of f.

a) $\lim_{x \to 0^-} f(x)$

b) $\lim_{x \to 0^+} f(x)$

c) $\lim_{x \to 0} f(x)$

3. Let $g(x) = \begin{cases} x^2 & if \ \ x < 1 \\ 2-x & if \ \ x \geq 1 \end{cases}$

Find the following limits, if they exist. Then sketch the graph of g.

a) $\lim_{x \to 1^-} g(x)$

b) $\lim_{x \to 1^+} g(x)$

c) $\lim_{x \to 1} g(x)$

4. Let $h(x) = \begin{cases} 1-x & if \;\; x < 0 \\ 0 & if \;\; x = 0 \\ -x-1 & if \;\; x > 0 \end{cases}$

Find the following limits, if they exist. Then sketch the graph of h.

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

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

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

5. Let $f(x) = \begin{cases} -1 & if \;\; x \le -2 \\ \frac{1}{2}x & if \;\; -2 < x < 2 \\ 1 & if \;\; x \ge 2 \end{cases}$

a) Find the following limits.

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

ii) $\lim\limits_{x \to -2^+} f(x)$

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

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

b) Sketch the graph of f.

c) Where is f continuous?