MAT 1214: CALCULUS I
LIMITS OF FUNCTIONS

(1) Find the limit, if it exists.

(a) $\lim\limits_{x \to 2}(x^3 + 5x^2 - 7x + 1) = $_____.

(b) $\lim\limits_{x \to -1}\dfrac{x}{3x + 2} = $_____.

(c) $\lim\limits_{x \to -\frac{2}{3}}\dfrac{x}{3x + 2} = $_____.

(d) $\lim\limits_{x \to 3}\sqrt{25 - x^2} = $_____.

(e) $\lim\limits_{x \to 10}\sqrt{25 - x^2} = $_____.

(f) $\lim\limits_{x \to 5}\sqrt{25 - x^2} = $_____.

(g) $\lim\limits_{x \to 5^-}\sqrt{25 - x^2} = $_____.

(h) $\lim\limits_{x \to 0}\dfrac{x^3 + 12x^2 - 5x}{5x} = $_____.

(i) $\lim\limits_{x \to 1}\dfrac{x^4 - 1}{x - 1} = $_____.

(j) $\lim\limits_{h \to 0}\dfrac{(x + h)^3 - x^3}{h} = $_____.

(k) $\lim\limits_{x \to 9}\dfrac{|9 - x|}{9 - x} = $_____.

(l) $\lim\limits_{x\to 9^+} \dfrac{|9-x|}{9-x} =$_____.

(m) $\lim\limits_{x\to 9^-} \dfrac{|9-x|}{9-x} =$_____.

(n) $\lim\limits_{x\to 0} \dfrac{\frac{1}{x+5} - \frac{1}{5}}{x} =$_____.

(2) If $\lim\limits_{x\to 2} \dfrac{f(x)-1}{x-1} = 2$, find $\lim\limits_{x\to 2} f(x) =$_____.