

MAT 1214: CALCULUS I
LIMITS OF FUNCTIONS

(1) Find the limit, if it exists.

(a) $\lim_{x \rightarrow 2} (x^3 + 5x^2 - 7x + 1) = \underline{\hspace{2cm}}$.

(b) $\lim_{x \rightarrow -1} \frac{x}{3x + 2} = \underline{\hspace{2cm}}$.

(c) $\lim_{x \rightarrow -\frac{2}{3}} \frac{x}{3x + 2} = \underline{\hspace{2cm}}$.

(d) $\lim_{x \rightarrow 3} \sqrt{25 - x^2} = \underline{\hspace{2cm}}$.

(e) $\lim_{x \rightarrow 10} \sqrt{25 - x^2} = \underline{\hspace{2cm}}$.

(f) $\lim_{x \rightarrow 5} \sqrt{25 - x^2} = \underline{\hspace{2cm}}$.

(g) $\lim_{x \rightarrow 5^-} \sqrt{25 - x^2} = \underline{\hspace{2cm}}$.

(h) $\lim_{x \rightarrow 0} \frac{x^3 + 12x^2 - 5x}{5x} = \underline{\hspace{2cm}}$.

(i) $\lim_{x \rightarrow 1} \frac{x^4 - 1}{x - 1} = \underline{\hspace{2cm}}$.

(j) $\lim_{h \rightarrow 0} \frac{(x + h)^3 - x^3}{h} = \underline{\hspace{2cm}}$.

(k) $\lim_{x \rightarrow 9} \frac{|9 - x|}{9 - x} = \underline{\hspace{2cm}}$.

$$(l) \lim_{x \rightarrow 9^+} \frac{|9 - x|}{9 - x} = \underline{\hspace{2cm}}.$$

$$(m) \lim_{x \rightarrow 9^-} \frac{|9 - x|}{9 - x} = \underline{\hspace{2cm}}.$$

$$(n) \lim_{x \rightarrow 0} \frac{\frac{1}{x+5} - \frac{1}{5}}{x} = \underline{\hspace{2cm}}.$$

$$(2) \text{ If } \lim_{x \rightarrow 2} \frac{f(x) - 1}{x - 1} = 2, \text{ find } \lim_{x \rightarrow 2} f(x) = \underline{\hspace{2cm}}.$$