

Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise. If you finish early, you may leave with my approval.

1. (0 points) Find the following limits:

(a) $\lim_{x \rightarrow 2} \frac{3x^2 - x - 10}{x^2 - 4}$

(b) $\lim_{x \rightarrow 0} \frac{\sin(4y)}{7y}$

(c) $\lim_{x \rightarrow \infty} \frac{x^2 + 8}{6x^2 - x}$

(d) $\lim_{x \rightarrow \infty} \frac{5x^3 + 7x - 8}{-4x^2 - 2x + 1}$

(e) $\lim_{x \rightarrow \infty} \frac{x^2 - 5x - 9}{2x^4 + 3x^3}$

2. (0 points) Evaluate the following limits for $f(x)$

$$f(x) = \begin{cases} x^2 - 3x + 4 & x \leq 1 \\ x + 1 & 1 < x \leq 3 \\ x^2 - 3x + 4 & x > 3 \end{cases}$$

(a) $\lim_{x \rightarrow 1^-} f(x)$

(b) $\lim_{x \rightarrow 1^+} f(x)$

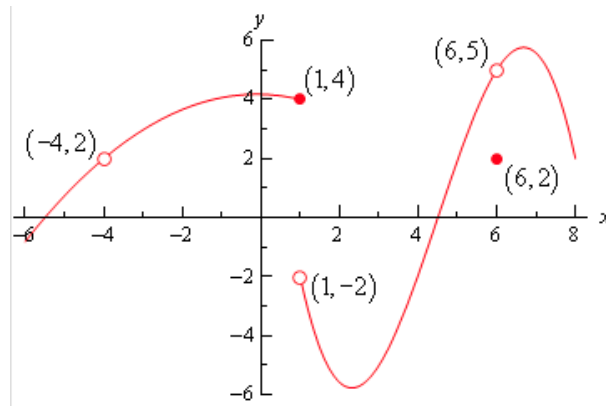
(c) $\lim_{x \rightarrow 1} f(x)$

(d) $\lim_{x \rightarrow 3^-} f(x)$

(e) $\lim_{x \rightarrow 3^+} f(x)$

(f) $\lim_{x \rightarrow 3} f(x)$

3. (0 points) Using the graph of $f(x)$ below, find the following limits:



(a) $\lim_{x \rightarrow 1^+} f(x)$

(b) $\lim_{x \rightarrow -4} f(x)$

(c) $\lim_{x \rightarrow 6} f(x)$

4. (0 points) Find the vertical and horizontal asymptotes of the following:

(a) $f(x) = \frac{x}{1-x}$

(b) $f(x) = \frac{5x^3 + 1}{x^2 - 1}$