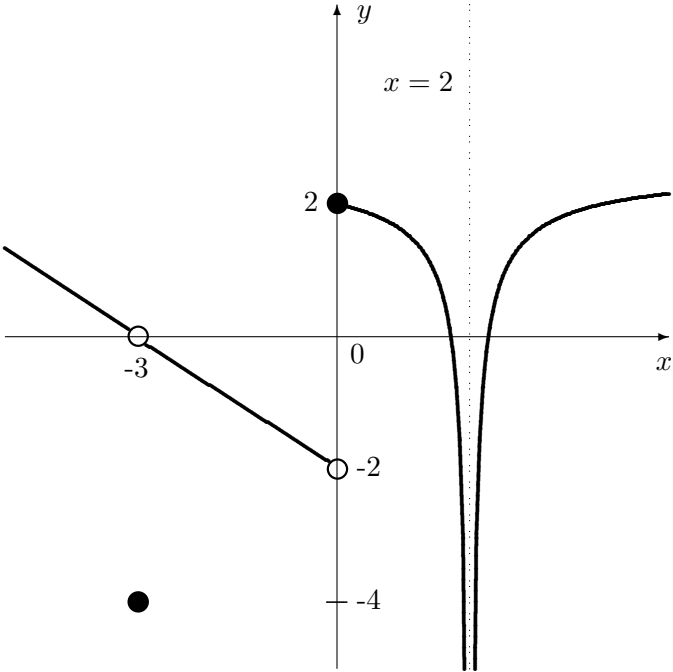


Name	MUN Number
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[12] 1. Use the graph of $y = f(x)$ below to determine each of the following. Label the limits as ∞ or $-\infty$ where appropriate. If the limit does not exist or the value of the function is undefined, indicate this.



(a) $f(2) =$ (b) $\lim_{x \rightarrow 2^-} f(x) =$

(c) $\lim_{x \rightarrow 2^+} f(x) =$ (d) $\lim_{x \rightarrow 2} f(x) =$

(e) $f(0) =$ (f) $\lim_{x \rightarrow 0^-} f(x) =$

(g) $\lim_{x \rightarrow 0^+} f(x) =$ (h) $\lim_{x \rightarrow 0} f(x) =$

(i) $f(-3) =$ (j) $\lim_{x \rightarrow -3^-} f(x) =$

(k) $\lim_{x \rightarrow -3^+} f(x) =$ (l) $\lim_{x \rightarrow -3} f(x) =$

[16] 2. Determine each of the following limits. If a limit does not exist, explain why.

(a) $\lim_{x \rightarrow 2} \frac{3x - 6}{3 - \sqrt{5x - 1}}$

(b) $\lim_{x \rightarrow 0} \frac{\sin^2(5x)}{x^2}$

(c) $\lim_{x \rightarrow -3} \left[\frac{6}{x^2 - 9} - \frac{1}{x^2 + 5x + 6} \right]$

- [4] 3. Identify any horizontal asymptotes to the graph of $f(x) = \frac{6x^2 + 7}{x(1 - 3x)}$.

- [8] 4. Given the function

$$f(x) = \begin{cases} kx + 7, & \text{for } x < 3 \\ 2\sqrt{k + 5}, & \text{for } x = 3 \\ x + k^2, & \text{for } x > 3 \end{cases}$$

for some constant k , determine each of the following.

- (a) All values of k for which $\lim_{x \rightarrow 3} f(x)$ exists.
- (b) All values of k for which $f(x)$ is continuous at $x = 3$.
- (c) All values of k for which $f(x)$ has a removable discontinuity at $x = 3$.