

MATH 1910 QUIZ 1

20 points

NAME: _____

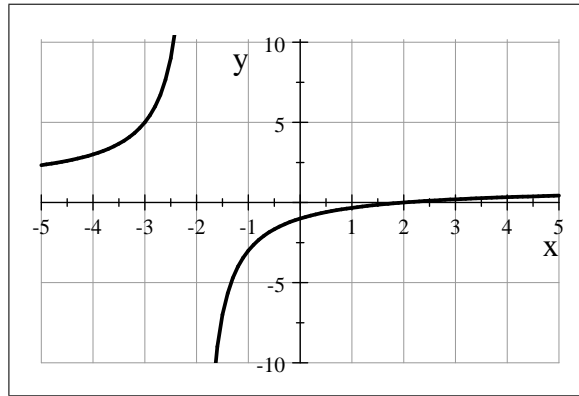
10 pts 1. Let $f(x) = \frac{x^2 - 5x + 6}{x^2 - x - 6}$.

- (a) The function f has a removable discontinuity at $x = 3$. Compute $\lim_{x \rightarrow 3} f(x)$. You must show your work and use proper limit notation for full credit.

$$\lim_{x \rightarrow 3} \frac{x^2 - 5x + 6}{x^2 - x - 6} = \lim_{x \rightarrow 3} \frac{(x - 3)(x - 2)}{(x - 3)(x + 2)} = \lim_{x \rightarrow 3} \frac{x - 2}{x + 2} = \frac{1}{6}$$

- (b) The function f has a non-removable discontinuity at $x = -2$. Complete the following statements:

$$\lim_{x \rightarrow -2^-} f(x) = +\infty \qquad \lim_{x \rightarrow -2^+} f(x) = -\infty$$



- 6 pts 2. Let $g(x) = \frac{9x^3 - 2x + 1}{4x^2 - 3}$. Evaluate $\lim_{x \rightarrow -\infty} g(x)$. You must use proper limit notation and justify your answer.

$$\lim_{x \rightarrow -\infty} \frac{9x^3 - 2x + 1}{4x^2 - 3} = \lim_{x \rightarrow -\infty} \frac{9x^3}{4x^2} = \lim_{x \rightarrow -\infty} \frac{9x}{4} = -\infty$$

- 4 pts 3. Use the graph of the function f below to decide whether each limit exists. If it does, find the value; if not, explain why.

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

(b) $\lim_{x \rightarrow 4^-} f(x) \approx 4.8$

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

(d) $\lim_{x \rightarrow 4} f(x)$ DNE (Left and right limits not equal)

