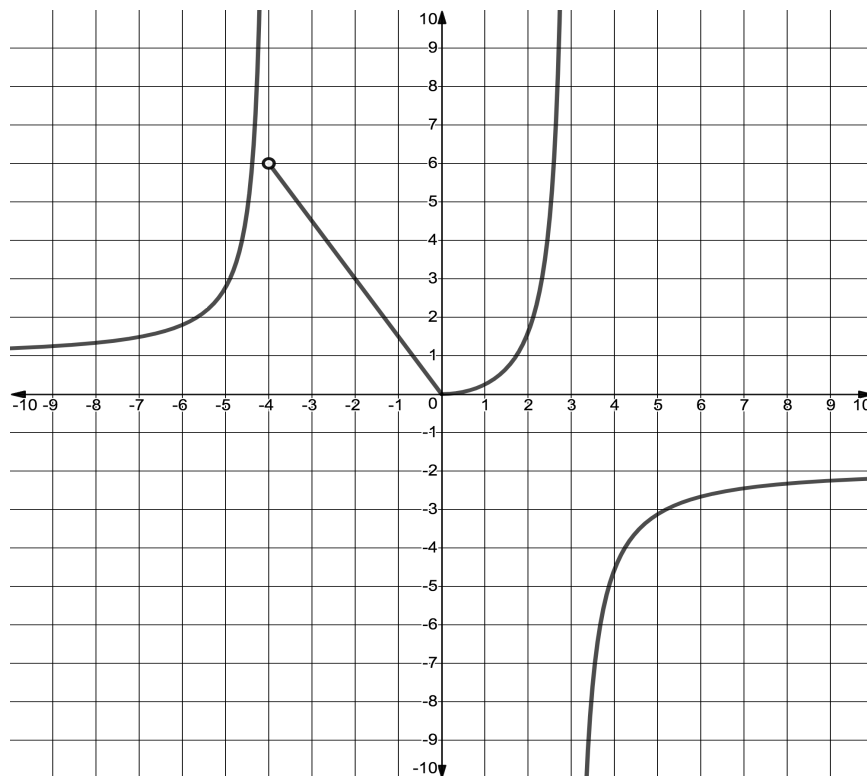


Name: _____

Group #: _____

1. Consider the graph of $f(x)$ in the graph below.

(a) Find the following:

i. $\lim_{x \rightarrow -4^-} f(x)$

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

ii. $\lim_{x \rightarrow -4^+} f(x)$

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

iii. $\lim_{x \rightarrow \infty} f(x)$

vi. $\lim_{x \rightarrow -\infty} f(x)$

(b) State any horizontal asymptotes for $f(x)$. If there are none, state that.(c) State any vertical asymptotes for $f(x)$. If there are none, state that.

2. Evaluate the following analytically:

$$(a) \lim_{x \rightarrow 8^+} \frac{-5}{x - 8}$$

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

$$(b) \lim_{x \rightarrow -\infty} (7x^7 - 4x^3 + 2x - 9)$$

$$(f) \lim_{x \rightarrow -\infty} (1 - 2x + 5x^2 - 17x^3 - 4x^8)$$

$$(c) \lim_{x \rightarrow 3^-} \frac{4}{3 - x}$$

$$(g) \lim_{x \rightarrow -5^+} \frac{(x + 5)^2}{x^2 + 5x}$$

$$(d) \lim_{x \rightarrow 0^+} \frac{1}{x + 3}$$

$$(h) \lim_{\theta \rightarrow \pi^-} \cot(\theta)$$

3. Find any horizontal and vertical asymptotes of $f(x) = \frac{3x^2}{x - x^2}$. If there are none, state that.

Evaluate the following limits and give the equation for any horizontal asymptote (if there are none, state that).

4. $\lim_{x \rightarrow \infty} \frac{-2x^3 - 2x + 3}{3x^3 + 3x^2 - 5x}$

5. $\lim_{x \rightarrow -\infty} \frac{4x^3 + 6x^2 - 2}{5 - 4x + 2x^2}$

6. $\lim_{x \rightarrow \infty} \frac{\sqrt[3]{x} + 4}{1 + 7\sqrt{x}}$