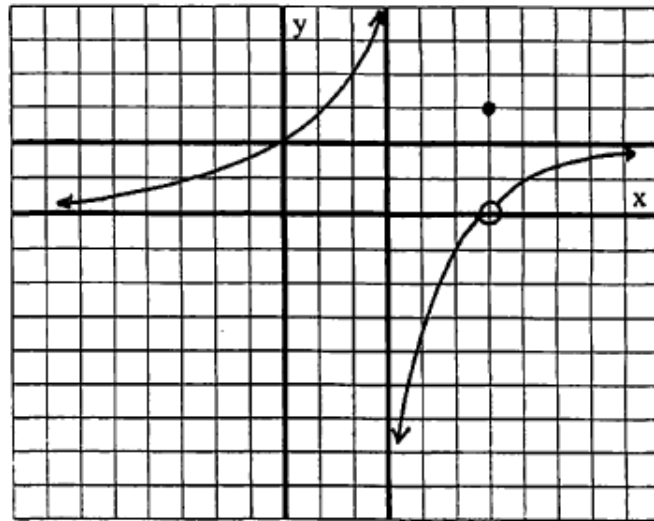


MCS21 (Calculus) Exam 2 Review Problems

1. (a) $\lim_{x \rightarrow 3^-} f(x) =$ _____
- (b) $\lim_{x \rightarrow 3^+} f(x) =$ _____
- (c) $\lim_{x \rightarrow 3} f(x) =$ _____
- (d) $\lim_{x \rightarrow 6} f(x) =$ _____
- (e) $\lim_{x \rightarrow -\infty} f(x) =$ _____
- (f) $f(6) =$ _____



2. Use limits to find the values of a and b that make the function

$$f(x) = \begin{cases} \frac{x^2-4}{x-2} & x < 2 \\ ax^2 - bx + 3 & 2 \leq x < 3 \\ 2x - a - b & x \geq 3 \end{cases} \quad \text{continuous everywhere.}$$

3. Let $f(x) = \begin{cases} \frac{x^2-16}{x-4} & x \neq 4 \\ 10 & x = 4 \end{cases}$

Which of the following statements are true?

- I. $\lim_{x \rightarrow 4} f(x)$ exists. II. $f(4)$ exists. III. f is continuous at $x = 4$

4. Given $f(x) = \frac{x^3 - 12x^2 + 32x}{x^2 - 2x - 8}$, state the following. Show all work below.

(If there are none, state "none.")

a) equation(s) of any vertical asymptotes:

b) equation(s) of any horizontal asymptotes:

c) coordinates of any removable points of discontinuity ("holes"):
