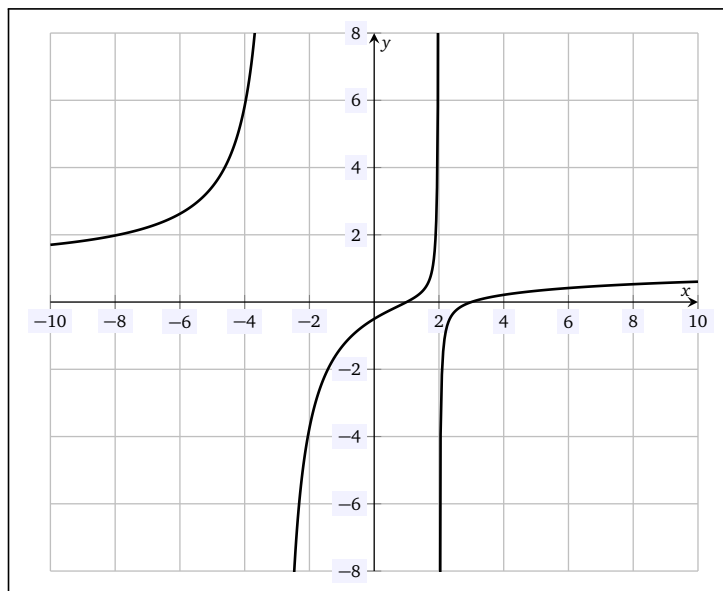


Problem 1: The plot of a function $f(x)$ is given below. Use the plot to evaluate the following limits:



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

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

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

(g) $\lim_{x \rightarrow \infty} f(x) =$

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

(h) $\lim_{x \rightarrow -\infty} f(x) =$

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

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

(i) What are the roots of $f(x)$?

Problem 2: Evaluate the following limits. You do not need to justify your answer.

(a) $\lim_{x \rightarrow \infty} \frac{2x^2 - 5x + 7}{7x^3 - 2x^2 + 6} =$

(e) $\lim_{x \rightarrow \infty} \frac{\sin x^2}{5x} =$

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

(f) $\lim_{x \rightarrow \infty} \frac{x^2 + 7x + 3}{\sqrt{x - 3}} =$

(c) $\lim_{x \rightarrow \infty} \frac{2^x}{x^3 + 2x + 1} =$

(g) $\lim_{x \rightarrow \infty} \frac{\ln x}{\sqrt{x}} =$

(d) $\lim_{x \rightarrow \infty} \frac{5 \ln x}{x^2 + 2x + 3} =$

(h) $\lim_{x \rightarrow \infty} \frac{x^3 + 5x + 9}{\sqrt{x^{10} - 4x + 6}} =$

Problem 3:

$$f(x) = \frac{(x+3)(x-2)(x+6)}{(x-2)(x+1)(x-3)}$$

- (a) What are the x -intercepts for $f(x)$?

- (b) What is the y -intercept for $f(x)$?

- (c) Where is $f(x)$ continuous?

- (d) What are vertical asymptotes for $f(x)$?

- (e) What are the horizontal asymptotes for $f(x)$?

- (f) Does $f(x)$ have any removable discontinuities? If so, what is the point?

Problem 4: Evaluate the following limit. Be sure to justify your answer completely: $\lim_{x \rightarrow -\infty} \frac{x^3 + 2x + 3}{x^2 + 6x + 1}$