

1. Consider the function $f(x) = \frac{x}{x^2 - 4}$. Draw the graph of $f(x)$. Where are the asymptotes (horizontal and vertical)? Are they different from the left and right?

2. Draw a function $f(x)$ with BOTH of the following properties: $\lim_{x \rightarrow \infty} f(x) = 2$ AND $\lim_{x \rightarrow -\infty} f(x) = 2$. Can you write a formula for $f(x)$?

3. Evaluate.

a. $\lim_{x \rightarrow \infty} \frac{x^4 + 9x - 3}{7x^3 + 2x^2 - 1}$

b. $\lim_{x \rightarrow 1} \frac{x^3 + 1}{(x^2 - 1)^2}$

c. $\lim_{x \rightarrow -\infty} e^{\frac{1}{x}}$

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

e. $\lim_{x \rightarrow -\infty} \frac{|x^2 - 1|}{x^2 + x}$

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