Exercise 6

Sketch the graph of an example of a function f that satisfies all of the given conditions.

$$\lim_{x \to 2} f(x) = \infty, \quad \lim_{x \to -2^+} f(x) = \infty, \quad \lim_{x \to -2^-} f(x) = -\infty,$$

$$\lim_{x \to -\infty} f(x) = 0, \quad \lim_{x \to \infty} f(x) = 0, \quad f(0) = 0$$

Solution

Below is the graph of a function that satisfies these conditions.

$$y = \frac{x^2}{(x+2)(x-2)^2}$$