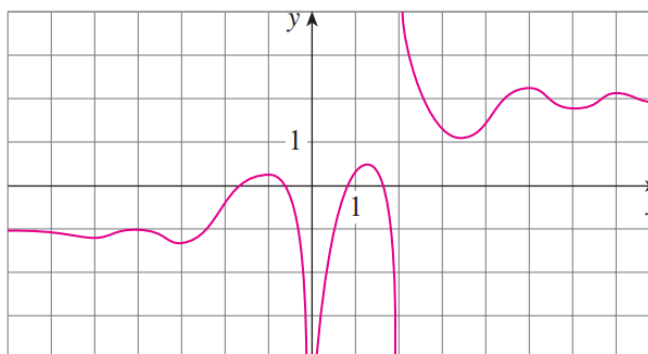


Exercise 4

For the function g whose graph is given, state the following.

- (a) $\lim_{x \rightarrow \infty} g(x)$ (b) $\lim_{x \rightarrow -\infty} g(x)$
 (c) $\lim_{x \rightarrow 0} g(x)$ (d) $\lim_{x \rightarrow 2^-} g(x)$
 (e) $\lim_{x \rightarrow 2^+} g(x)$ (f) The equations of the asymptotes



Solution

Use the given graph to evaluate the limits. Note that the limits in which $x \rightarrow \pm\infty$ give the horizontal asymptotes if they are finite.

- (a) $\lim_{x \rightarrow \infty} g(x) = 2$
 (b) $\lim_{x \rightarrow -\infty} g(x) = -1$
 (c) $\lim_{x \rightarrow 0} g(x) = -\infty$
 (d) $\lim_{x \rightarrow 2^-} g(x) = -\infty$
 (e) $\lim_{x \rightarrow 2^+} g(x) = \infty$

The horizontal asymptotes are $y = 2$ and $y = -1$, and the vertical asymptotes are $x = 0$ and $x = 2$.