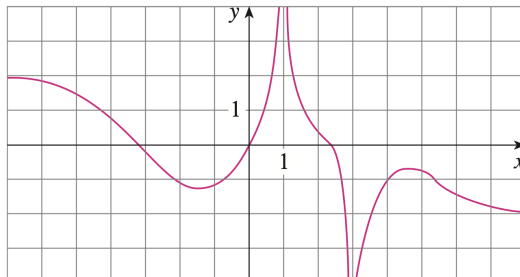


Reading Stewart §3.4.

1. For the function  $f$  whose graph is given, state the following.



a)  $\lim_{x \rightarrow \infty} f(x)$

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

c)  $\lim_{x \rightarrow 1} f(x)$

d)  $\lim_{x \rightarrow 3} f(x)$

- e) The equations of the asymptotes

2. For each of the following limits, either compute it (showing all steps) or explain why it diverges. In either case, show your steps, as always.

(a)  $\lim_{x \rightarrow -\infty} \frac{3 - 4x^2}{x^3 + 2x - 7}$

(b)  $\lim_{x \rightarrow \infty} \frac{\sqrt{x} + 2x^2}{3x^2 - 4x + 501}$

3. For each of the following limits, either compute it (showing all steps) or explain why it diverges. In either case, show your steps, as always.

(a)  $\lim_{x \rightarrow \infty} \frac{(x^3 + 435x)(x^2 - 25x + 671)}{4x^5 + 7x^4 - 37}$

(b)  $\lim_{x \rightarrow -\infty} 4x^3 + 56x^2 + 43$

4. For each of the following limits, either compute it (showing all steps) or explain why it diverges. In either case, show your steps, as always.

(a)  $\lim_{x \rightarrow \infty} \frac{\sqrt{9x^6 + 5}}{x^3 - 6x}$

(b)  $\lim_{x \rightarrow -\infty} \frac{\sqrt{9x^6 + 5}}{x^3 - 6x}$

5. Let  $f(x) = \frac{2x^2 - x + 7}{x^2 - x - 12}$ . Find all of the horizontal and vertical asymptotes of  $f$ .