

1. Sketch the graph of a function that satisfies the following conditions:

- $\lim_{x \rightarrow -1} f(x) = \infty$
- $\lim_{x \rightarrow 1^-} f(x) = 2$
- $\lim_{x \rightarrow 1^+} f(x) = -1$
- $\lim_{x \rightarrow \infty} f(x) = 3$
- $f(1) = 0$

2. Sketch the graph of a function that satisfies the following conditions:

- $\lim_{x \rightarrow -\infty} f(x) = \infty$
- $\lim_{x \rightarrow 0} f(x) = 1$
- $\lim_{x \rightarrow -2^-} f(x) = -\infty$
- $\lim_{x \rightarrow -2^+} f(x) = 4$
- $f(0) = 0$
- $f(-2) = 2$
- f is even

3. Evaluate $\lim_{x \rightarrow \infty} \frac{3x^2 - 17x + 4}{2x^2 + 6x - 13}$

4. Evaluate $\lim_{x \rightarrow -\infty} \frac{3x^5 - 2x^2 + 1}{5x^5 + 6x^4 - 2x^3}$

5. Evaluate $\lim_{x \rightarrow \infty} (\sqrt{36x^2 - x} - 6x)$

6. Evaluate $\lim_{x \rightarrow \infty} (x - \sqrt{x^2 + 4x})$

7. Evaluate $\lim_{x \rightarrow \infty} \frac{e^{2x} - 3e^x}{2e^{2x} + 6}$

8. Evaluate $\lim_{x \rightarrow \infty} (\ln(x^2 + 1) - \ln(x^2 - 1))$

9. Evaluate $\lim_{x \rightarrow \infty} \frac{\sqrt{9x^6 + 5x} - 2x^2}{6x^3 - 5x}$

10. Find all horizontal asymptotes of $f(x) = \frac{2x^2 + 11x + 12}{2x^2 + x - 3}$