

1. Sketch the graph of a function f such that:

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



2. Find the limit (either a number, ∞ , or $-\infty$) or explain why it does not exist: $\lim_{x \rightarrow 5^-} \frac{x+1}{x-5}$

3. We wish to sketch a graph of the function $f(x) = \frac{3x^2 - 3x}{x^2 - 1}$.

- a) Find all horizontal and vertical asymptotes of f and draw corresponding dashed lines on the graph.
- b) Determine how the function approaches each asymptote and fill in this information on the graph.
- c) Find a few convenient points, make some educated guesses, and fill in the rest of the graph.



4. Find the limit (either a number, ∞ , or $-\infty$) or explain why it does not exist: $\lim_{x \rightarrow -\infty} \frac{|x+1|}{x}$