End Behavior

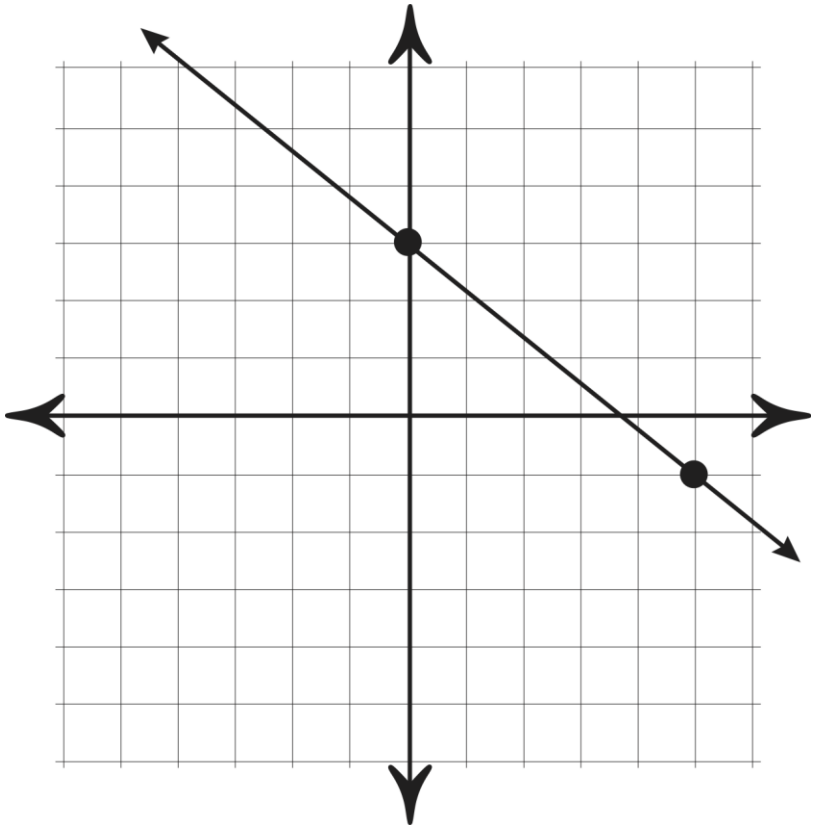
The **<u>end behavior</u>** of a function is what the y-values do as the x-values grow to ∞ or $-\infty$.

Notation:

As $x \to \infty$, $f(x) \to$ _____

As $x \to -\infty$, $f(x) \to$ _____

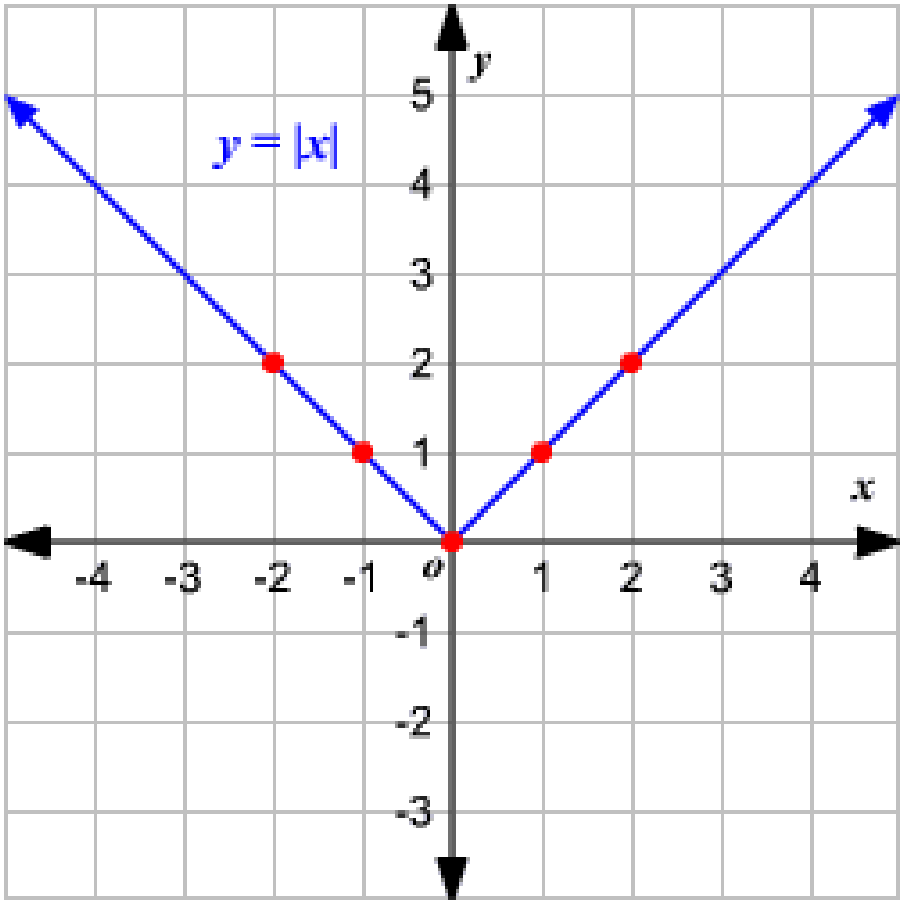
Describe the end behavior of the function:



As $x \to \infty$, $f(x) \to -\infty$

As $x \to -\infty$, $f(x) \to \infty$

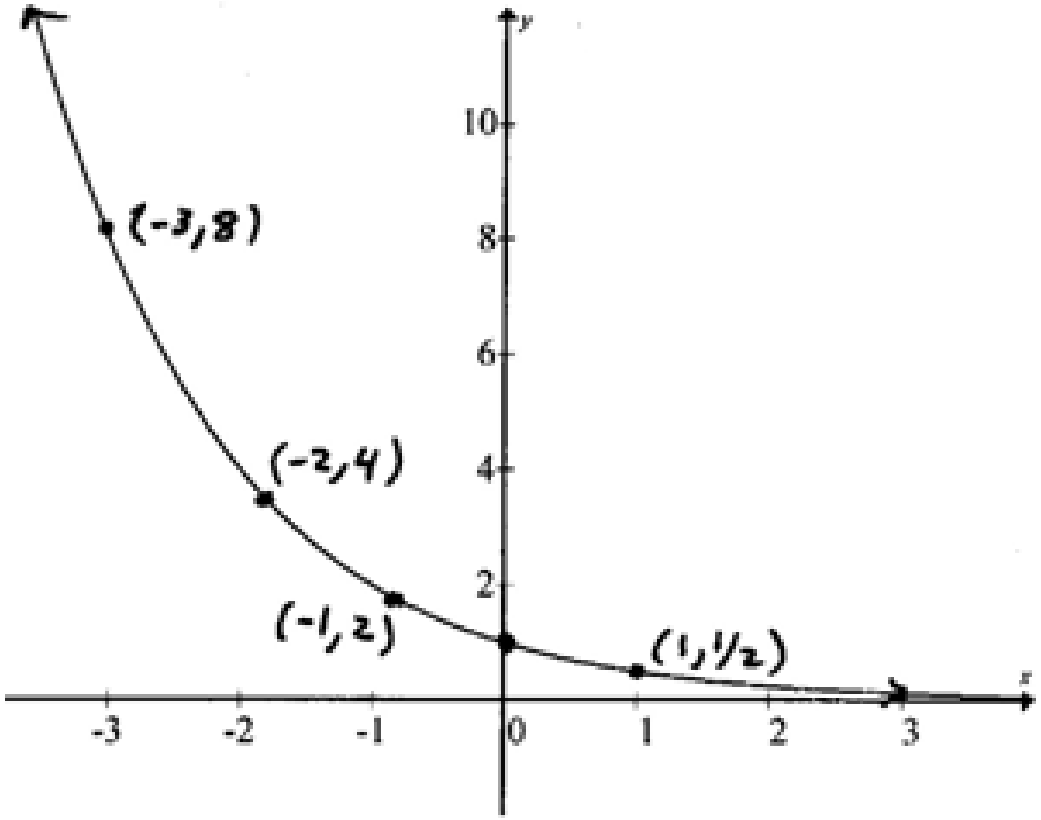
Describe the end behavior of the function:



As x → ∞, f(x) → ∞

As x → -∞, f(x) → ∞

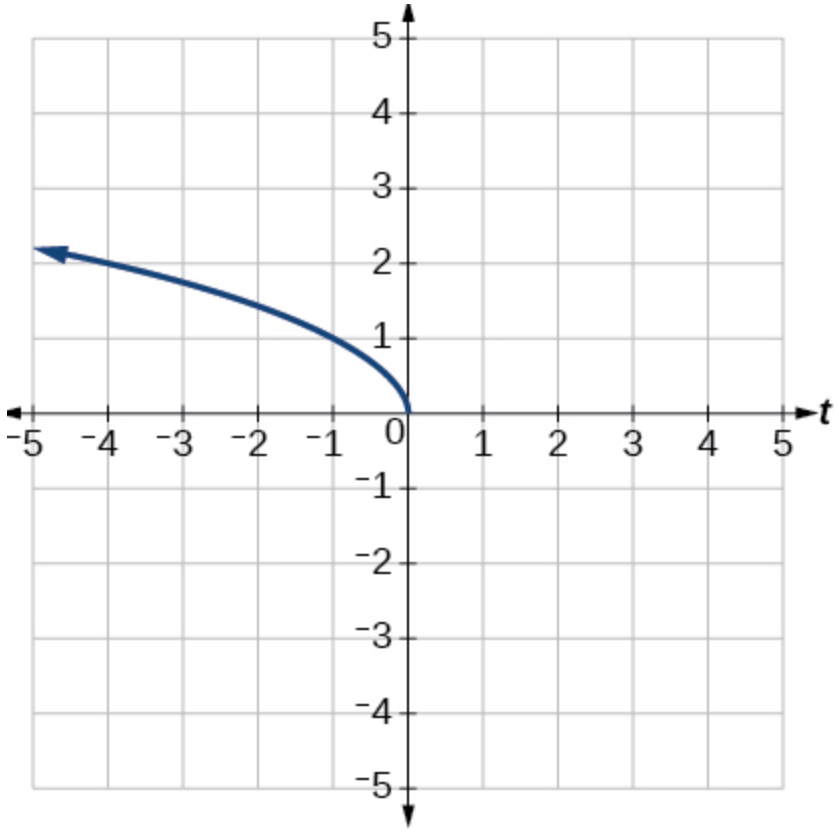
Describe the end behavior of the function:



As x → ∞, f(x) → 0

As x → -∞, f(x) → ∞

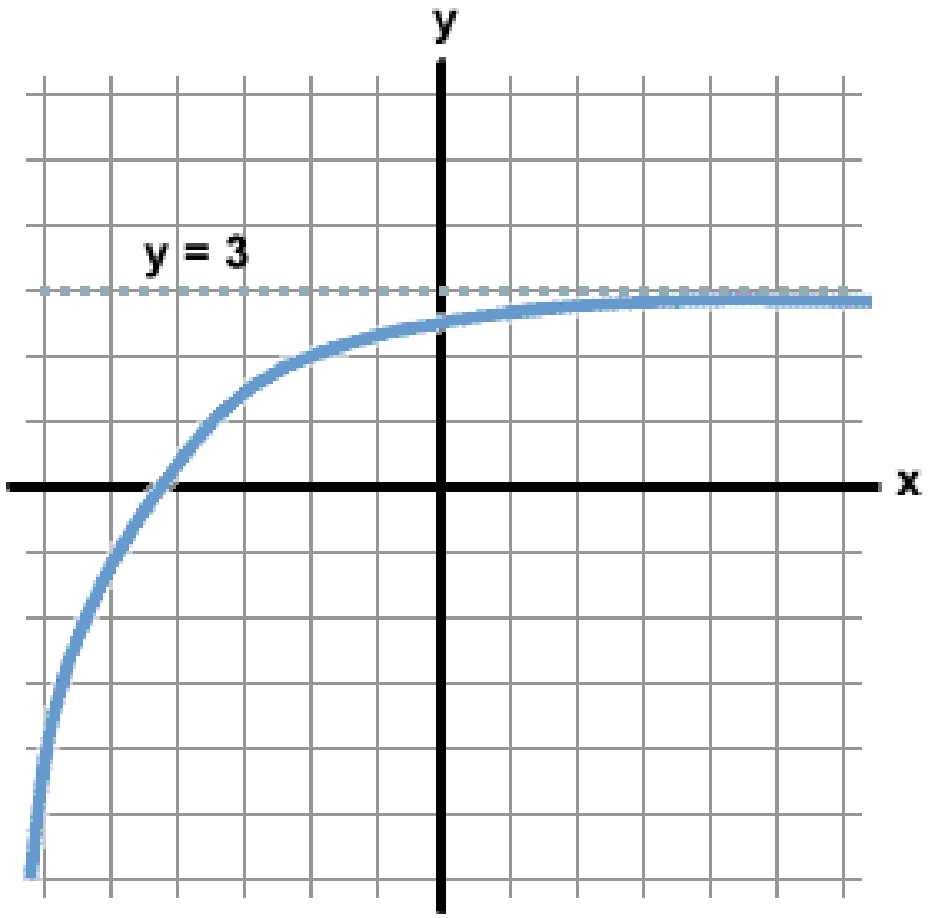
Describe the end behavior of the function:



As $x \to -\infty$, $f(x) \to \infty$

There is no end behavior as $x \to \infty$ because x does not approach ∞

Describe the end behavior of the function:

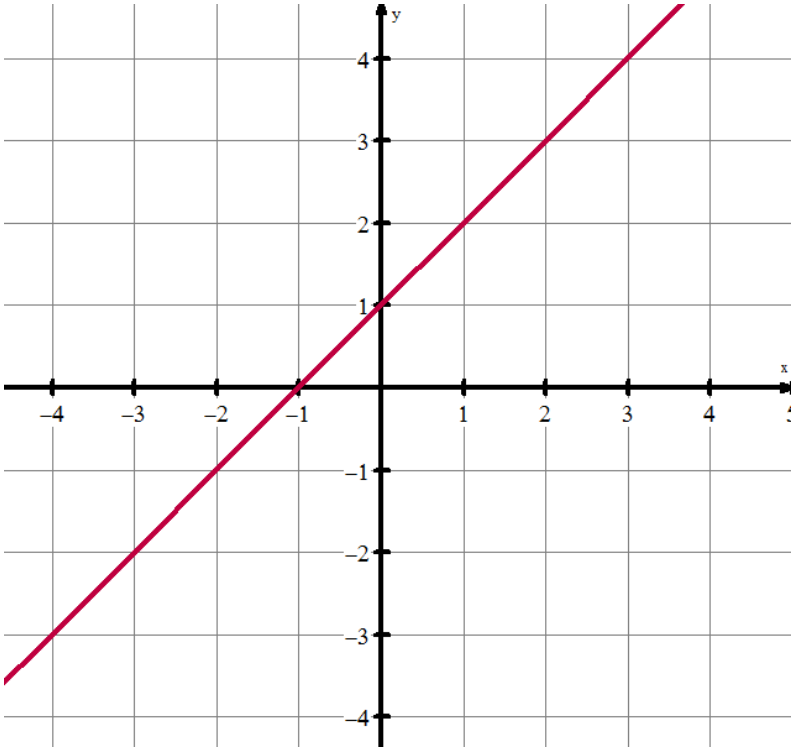


As $x \to \infty$, $f(x) \to 3$

As $x \to -\infty$, $f(x) \to -\infty$

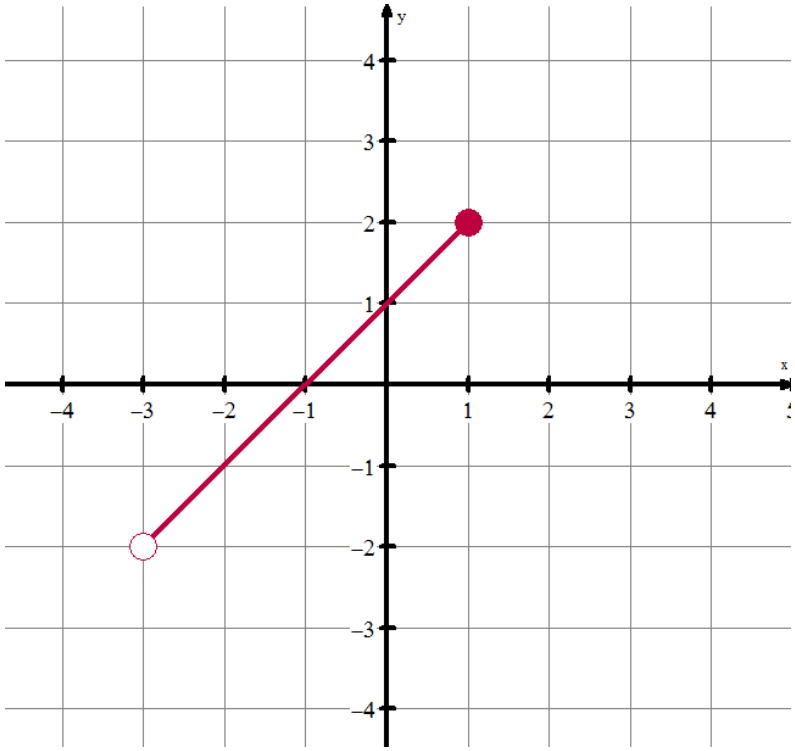
A **restricted domain** is where you look at only part of the domain instead of the whole thing.

Graph of y = x + 1



Range: (-∞, ∞)

Graph of y = x + 1 with the restricted domain of (-3, 1]



Range: (-2, 2]