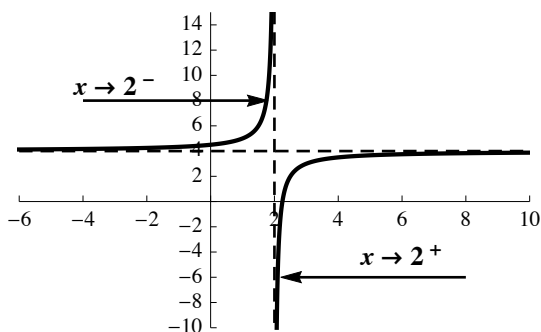


One-Sided Limits

If you recall from our earlier work with approach statements, we can describe how a function behaves as x values are approaching from the left and from the right:



The same is true for limits. We can also take one-sided limits using numbers less than a (left-hand limit):

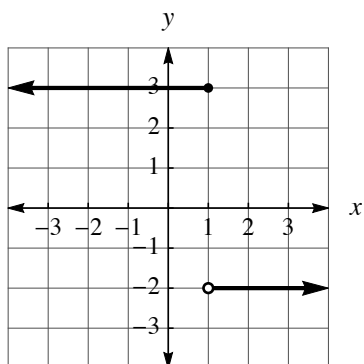
$$\lim_{x \rightarrow a^-} f(x)$$

We can also take one-sided limits using numbers greater than a (right-hand limit):

$$\lim_{x \rightarrow a^+} f(x)$$

Example

A piecewise function is graphed below. Find $\lim_{x \rightarrow 1^-} f(x)$ and $\lim_{x \rightarrow 1^+} f(x)$.



Solution

By inspecting the graph,

$$\lim_{x \rightarrow 1^-} f(x) = 3$$

and

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