

1 2.6: Limits at Infinity

In 2.2, we learned that if $y \rightarrow \pm\infty$ as $x \rightarrow a$, then the graph of f has a **vertical asymptote** at $x = a$. Similarly, if $y \rightarrow L$ as $x \rightarrow \pm\infty$, then the graph of the function has a **horizontal asymptote** at $y = L$.

Key Limit: $\lim_{x \rightarrow \pm\infty} \frac{1}{x} =$

Computing Limits at Infinity:

Examples:

$$\lim_{x \rightarrow \infty} \sqrt{x^2 + x} - x =$$

Find the horizontal asymptotes of $f(x) = \frac{\sqrt{x^2 + 2x}}{2x + 3}$

(On Your Own) $\lim_{x \rightarrow -\infty} \frac{x^2 + 4}{x^2 - 2x} =$