

Limits Involving Infinity (Limit Approaches Infinity)

For Rational Functions Only:

Method 1: Divide each term by the highest power in the denominator.

Method 2: Compare the degree of the numerator to the degree of the denominator.

$$\lim_{x \rightarrow \pm\infty} \frac{f(x)}{g(x)} = \begin{cases} \text{If degree of } f(x) = \text{degree of } g(x), \text{ then } \frac{\text{leading coefficient}}{\text{leading coefficient}} \\ \text{If degree of } f(x) > \text{degree of } g(x), \text{ then } \infty \\ \text{If degree of } f(x) < \text{degree of } g(x), \text{ then } 0 \end{cases}$$

Directions: Evaluate each limit.

1) $\lim_{x \rightarrow \infty} \frac{2x-5}{4x-1} =$

Method 1:

Method 2:

2) $\lim_{x \rightarrow \infty} \frac{3x^2 - 2x + 7}{4 - 5x^2} =$

Method 1:

Method 2:

$$3) \lim_{x \rightarrow \infty} \frac{4x-3}{\sqrt{9x^2+1}} =$$

Method 1:

Method 2:

$$4) \lim_{x \rightarrow \infty} \frac{4x^2}{3x^3 + x^2 - 7} =$$

Method 1:

Method 2:

$$5) \lim_{x \rightarrow \infty} \frac{10^7 x^4}{10^6 x^5 + 7^{10} x^2 + 1} =$$

Method 1:

Method 2:

$$6) \lim_{x \rightarrow \infty} \frac{x^8}{2 - 3x^5 + 7x^6 + 4x^7} =$$

Method 1:

Method 2: