
Complete the following problems. Show all work to receive full credit.

Find the following limits:

1. Find the following limits:

$$\begin{aligned} \text{(a)} \quad \lim_{x \rightarrow \infty} \frac{3x^2 - 6x}{4x - 8} &= \lim_{x \rightarrow \infty} \frac{\frac{1}{x}(3x^2 - 6x)}{\frac{1}{x}(4x - 8)} \\ &= \lim_{x \rightarrow \infty} \frac{3x - 6}{4 - \frac{8}{x}} \\ &= \lim_{x \rightarrow \infty} \frac{3x - 6}{4} = \infty \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad \lim_{x \rightarrow -\infty} \frac{-2x^3 - 2x + 3}{3x^3 + 3x^2 - 5x} &= \lim_{x \rightarrow -\infty} \frac{\frac{1}{x^3}(-2x^3 - 2x + 3)}{\frac{1}{x^3}(3x^3 + 3x^2 - 5x)} \\ &= \lim_{x \rightarrow -\infty} \frac{-2 - \frac{2}{x^2} + \frac{3}{x^3}}{3 + \frac{3}{x} - \frac{5}{x^2}} \\ &= \frac{-2}{3} \end{aligned}$$

$$\text{(c)} \quad \lim_{x \rightarrow 1^-} \frac{x}{x^2 - 1}$$

We should check points:

x	$\frac{x}{x^2-1}$
.99	-49.7487437
.999	-499.7498749
.9999	-4999.749987

Therefore $\lim_{x \rightarrow 1^-} \frac{x}{x^2 - 1} = -\infty$