

Question 1

Evaluate the limit:

$$\lim_{x \rightarrow \infty} \frac{6x^3 - 4x^2 + 10}{3x^3 + 5x - 7}$$

Question 1 - Solution

We are given:

$$\lim_{x \rightarrow \infty} \frac{6x^3 - 4x^2 + 10}{3x^3 + 5x - 7}$$

Step 1: Identify the dominant terms.

As $x \rightarrow \infty$, the highest degree terms dominate: Numerator: $6x^3$, Denominator: $3x^3$

So we focus on:

$$\frac{6x^3}{3x^3} = 2$$

Step 2: Divide all terms by x^3 :

$$\lim_{x \rightarrow \infty} \frac{6 - \frac{4}{x} + \frac{10}{x^3}}{3 + \frac{5}{x^2} - \frac{7}{x^3}} = \frac{6}{3} = 2$$

Conclusion:

$\lim_{x \rightarrow \infty} \frac{6x^3 - 4x^2 + 10}{3x^3 + 5x - 7} = 2$
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