

Question 3

Evaluate the limit:

$$\lim_{x \rightarrow \infty} \frac{3x^2 - x + 4}{5x^2 + 7x - 9}$$

Question 3 - Solution

We are given:

$$\lim_{x \rightarrow \infty} \frac{3x^2 - x + 4}{5x^2 + 7x - 9}$$

To evaluate this limit, we divide both numerator and denominator by x^2 , the highest power of x :

$$\lim_{x \rightarrow \infty} \frac{3 - \frac{1}{x} + \frac{4}{x^2}}{5 + \frac{7}{x} - \frac{9}{x^2}}$$

As $x \rightarrow \infty$, the terms $\frac{1}{x}$, $\frac{4}{x^2}$, $\frac{7}{x}$, $\frac{9}{x^2} \rightarrow 0$, so we get:

$$\frac{3 - 0 + 0}{5 + 0 - 0} = \frac{3}{5}$$

Final Answer:

$$\boxed{\frac{3}{5}}$$