

Question 5

Determine the limit:

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

Question 5 - Solution

We are given:

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

Step 1: Compare the degrees of the numerator and denominator.

Degree of numerator: 4 , Degree of denominator: 3

Since the degree of the numerator is greater than the degree of the denominator, the limit is infinite (the function diverges).

Step 2: Determine the sign of the infinity.

As $x \rightarrow \infty$, both numerator and denominator are positive:

$$\frac{5x^4 + \text{smaller terms}}{2x^3 + \text{smaller terms}} > 0$$

So the limit tends to:

$$\boxed{+\infty}$$