

Question 7

Evaluate the limit:

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

Question 7 - Solution

We are given:

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

Step 1: Factor the numerator

Factor the quadratic:

$$x^2 + 3x - 4 = (x + 4)(x - 1)$$

So the expression becomes:

$$\frac{(x + 4)(x - 1)}{x - 1}$$

We can cancel $x - 1$ when $x \neq 1$:

$$= x + 4 \quad \text{for } x \neq 1$$

So the original expression simplifies to $x + 4$, and we can evaluate the limit directly.

Step 2: Evaluate the limit

Since we simplified the expression:

$$\lim_{x \rightarrow 1^-} (x + 4) = 1 + 4 = 5$$

Conclusion:

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