

Question 1

Evaluate the following limit and describe the behavior of the function near the point of discontinuity:

$$\lim_{x \rightarrow 1^-} \frac{3}{(x-1)^2}$$

Question 1 - Solution

We are asked to evaluate:

$$\lim_{x \rightarrow 1^-} \frac{3}{(x-1)^2}$$

Step 1: Observe the behavior of the denominator

As $x \rightarrow 1^-$, the value of $x - 1$ becomes a small negative number. Squaring it makes it a small positive number:

$$(x-1)^2 > 0 \quad \text{but very small}$$

So the expression becomes:

$$\frac{3}{\text{small positive number}} \rightarrow +\infty$$

Conclusion:

The function grows without bound as x approaches 1 from the left.

$$\boxed{\lim_{x \rightarrow 1^-} \frac{3}{(x-1)^2} = \infty}$$