TOPIC

Mathematics – Section I – Question 5

QUESTION

The definition of the first derivative of a function $f(x)$ is

(A) $f'(x) = \frac{f(x+\Delta x)+f(x)}{\Delta x}$

(B) $f'(x) = \frac{f(x+\Delta x)-f(x)}{\Delta x}$

(C) $f'(x) = \lim_{\Delta x \to 0} \frac{f(x+\Delta x)+f(x)}{\Delta x}$

(D) $f'(x) = \lim_{\Delta x \to 0} \frac{f(x+\Delta x)-f(x)}{\Delta x}$

HINT

Do not forget the limit.

SOLUTION

The definition of the first derivative of the function $f(x)$ is

$$f'(x) = \lim_{\Delta x \to 0} \frac{f(x+\Delta x)-f(x)}{\Delta x}$$

Choice (B) is incorrect as it is an approximate method to calculate the first derivative of a function $f(x)$. In fact, choice (B) is the forward divided difference method of approximately calculating the first derivative of a function.

ANSWER

(D)

CONTRIBUTOR

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