

Today's IIScian Approach

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = \begin{cases} \frac{x}{|x|} & ; x \neq 0 \\ 0 & ; x = 0 \end{cases}$

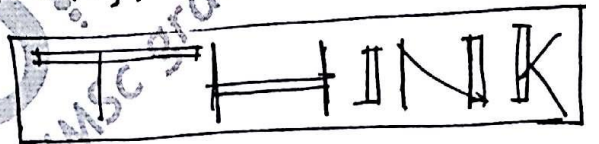
and $F(x) := \int_0^x f(t) dt, x \in \mathbb{R}$.

Then WOTF is NOT True?

- (a) $F'(0)$ does NOT exist
- (b) $F(x)$ is cts $\forall x$
- (c) F is Antiderivative of f on $[-1, 1]$
- (d) F is diff on $\mathbb{R} \setminus \{0\}$.

Sol :-

HOW TO



And recall some basic facts:-

An Antiderivative of f is a differentiable function F whose derivative is f i.e. $F' = f$.

Here $f(x) = \begin{cases} 1 & ; x > 0 \\ -1 & ; x < 0 \\ 0 & ; x = 0 \end{cases}$ and $F(x) = \int_0^x f(t) dt$

So, $F(x) = \begin{cases} x & ; x > 0 \\ -x & ; x < 0 \\ 0 & ; x = 0 \end{cases}$ i.e. $F(x) = |x|, x \in \mathbb{R}$.



clearly $F(x) = |x|$ is cts $\forall x \in \mathbb{R}$, $F(x)$ is diff on $\mathbb{R}^* = \mathbb{R} \setminus \{0\}$, $F'(0)$ does NOT exist.

Thus F is NOT diff. on $[-1, 1]$ (infact at $x=0$)

& hence F is NOT Antiderivative of f on $[-1, 1]$.

so (c) is correct.

DU-MSC 2017: Crash Course for 2 weeks from 19th June at Jia Sarai
 Daily 2 hours classes
 Problem Solving session
 How to approach problems!!!