Monday, May 3, 2021 9:51 AM

Q#

$$f(x) = \begin{cases} \frac{1}{2}x + 1, & \text{for } x \le 4 \\ -x + 7, & \text{for } x \ge 4 \end{cases}$$

Is $f(x)$ is continuous at $x = 4$.

Sol

i) $f(x)$ is def at $x = 4$.

$f(x) = -x + 7$, $x = 4$

$f(4) = -4 + 7$, $f(4) = 3$

2) $\lim_{x \to 4} f(x)$:.

L.H.L $= \lim_{x \to 4^-} \left(\frac{1}{2}x + 1\right)$, R.H.L $= \lim_{x \to 4^+} (-x + 7)$

$= \frac{1}{2}(4) + 1$ $= -4 + 7$

L.H.L $= 3$ R.H.L $= 3$

$\lim_{x \to 4} f(x) = 3$ exist

3) $\lim_{x \to 4} f(x) = f(4) \Rightarrow 3 = 3$

$f(x)$ is cont at $x = 4$.

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Q#2

$$f(x) = \begin{cases} \frac{1}{2}x + 1, & x > 4 \\ -x + 5, & x < 4 \end{cases}$$

is $f(x)$ is Continuous at $x = 4$.

1) $f(x)$ is def at $x = 4$

Function is not def

Function is discontinuous.