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ENG 281
Eng Maths

Assignment

2) The model of a system has been developed by an Engineer to be as given at the equation $f(x) = 5x - 21$. Given that f, D_f , and using a step of 0.01 demonstrate in a tabular form, that the limit of the model as $x \rightarrow 6$ is equal to 9.

Sub		Sub	
$f(x)$	$5x - 21$	$x = 6$	$f(x)$
8.56	5.40	6.10	9.30
8.55	5.41	6.09	9.45
8.60	5.42	6.08	9.46
8.65	5.43	6.07	9.35
8.70	5.44	6.06	9.30
8.75	5.45	6.05	9.25
8.80	5.46	6.04	9.20
8.85	5.47	6.03	9.15
8.90	5.48	6.02	9.10
8.95	5.49	6.01	9.05
9.00	6.00	6.00	9.00

Since the limits are defined both on the Left hand and Right hand side, therefore the limit is real and exists

(3) Find the limit of $\lim_{x \rightarrow 3^+} \frac{3-x}{|3-x|}$

Sub

$$\lim_{x \rightarrow 3^+} = \frac{3 - (3 + \delta)}{|3 - (3 + \delta)|} = \frac{3 - 3 - \delta}{|3 - 3 - \delta|} = \frac{-\delta}{\delta} = -1$$

4) Evaluate $\lim_{x \rightarrow 3} \frac{x-3}{|x-3|}$

$\lim_{x \rightarrow 3} \frac{x-3}{|x-3|} = \frac{3-3}{|3-3|} = \frac{0}{0}$

Using L'Hopital's rule $= \frac{1}{0}$ undefined

Since it is undefined we put $(3+\delta)$ and $(3-\delta)$

$= \lim_{x \rightarrow 3} \frac{(3+\delta)-3}{|(3+\delta)-3|} = \frac{-\delta}{|\delta|} = \frac{-1}{1}$

$= \frac{-(3-\delta)-3}{|3-\delta-3|} = \frac{-\delta}{|\delta|} = \frac{-1}{1}$

\therefore Since R-H-S and L-H-S limits do not correlate the limit of $x-3/|x-3|$ doesn't exist.

5) putting 4 as x in $f(x) = \sqrt{x-4}$ $x=5$
 $f(x) = \sqrt{4-4} = \sqrt{0} = 0$ $f(x) = \sqrt{5-4} = \sqrt{1} = 1$

putting 8 as x
 $f(x) = \sqrt{8-4} = \sqrt{4} = 2$
 $f(x) = \sqrt{7-4} = \sqrt{3} = 1.73$

$f(x) = \sqrt{x-4}$

0

1

1.41

1.73

2

it is continuous

$$(1) f(x) = \pi$$

$$\text{find } \lim_{x \rightarrow 3} f(x)$$

Sol

$$\lim_{x \rightarrow 3} f(x) \quad (f(x) = \pi)$$

$$= 3.142$$