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Electrical Electronics Engr.

ENG 281 Assignment

1. Given a function to be as in Equation (c)

$$F(x) = \pi$$

$$\text{Find } \lim_{x \rightarrow 3} F(x)$$

$$\lim_{x \rightarrow c} b = b \quad \lim_{x \rightarrow c} c = c$$

$$x \rightarrow c \quad \lim b = b$$

$$x \rightarrow c$$

$$\lim F(x) = \pi$$

$$x \rightarrow 3$$

$$\therefore \pi$$

2. The model of a system has been developed by an Engineer to be as given in Equation (e). $F(x) = 5x - 21$. Given that $\delta = 0.1$ and using a step of 0.01, demonstrate, in tabular form, that the limit of the model as $x \rightarrow 6$ is equal to 9.

Solu.

$F_x = 5(a - \delta) - 21$	$a - \delta$	a	$a + \delta$	$F_x = 5(a + \delta) - 21$
8.50	5.9	6	6.1	9.50
8.55	5.91		6.09	9.45
8.60	5.92		6.08	9.40
8.65	5.93		6.07	9.35
8.70	5.94		6.06	9.30
8.75	5.95		6.05	9.25
8.80	5.96		6.04	9.20
8.85	5.97		6.03	9.15

8.90	5.98	6.02	9.10
8.95	5.99	6.01	9.05
9.00	6.00	6.00	9.00

∴ From the table the limit of $f(x) = 5x - 21$ as $x \rightarrow 6$ is

3. Find the limit of the model equation given in Equation (3).

$$\lim_{x \rightarrow 3^+} \frac{3-x}{|3-x|}$$

Solu.

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

$$= \frac{\delta}{\delta}$$

$$= 1$$

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

4. Evaluate the limit of the model given in Equation (4), if it exists

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

Solu.

$$\lim_{x \rightarrow 3^+} \frac{x-3}{|x-3|}$$

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

$$= \frac{\delta}{\delta}$$

$$= 1$$

~~$$\lim_{x \rightarrow 3^-} \frac{x-3}{|x-3|}$$

$$= \lim_{x \rightarrow 3^-} \frac{3-\delta-3}{|3-\delta-3|}$$~~

~~$$\lim_{x \rightarrow 3^-} \frac{x-3}{|x-3|}$$

$$= \lim_{x \rightarrow 3^-} \frac{3-\delta-3}{|3-\delta-3|}$$~~

$$z = \frac{-8}{8}$$

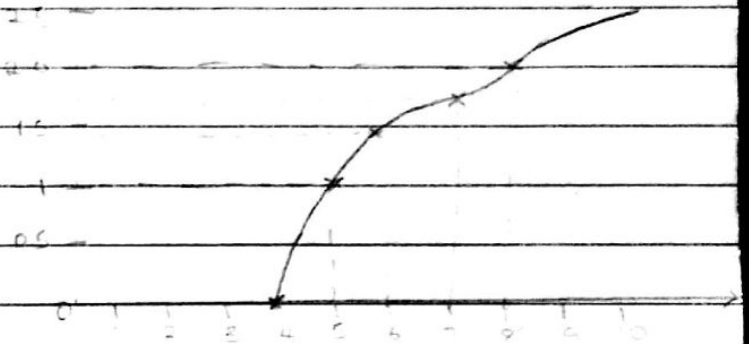
$$z = -1$$

4) The limit does not exist because Right sided limit is not equal to the left sided limit.

5) Show that the function given in Equation (5)

$f(x) = \sqrt{x} - 4$ is continuous on the interval $[4, 8]$.

x	$f(x)$
4	0
5	1
6	1.41
7	1.73
8	2



From the graph shown, the function $f(x) = \sqrt{x} - 4$ is continuous.