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 DEPT: ELECTRICAL/ELECTRONICS ENGINEERING  
 MATRIC NO: 17/ENGR041011  
 course code: ENGR281 (Engineering Mathematics).

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

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

$$\lim_{x \rightarrow 3} \pi$$

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2. The model of a system has been developed by an Engineer to be as given in Equation (2)

$$f(x) = 5x - 21$$

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.

$f(x)$	$a - \delta$	$a + \delta$	$f(x)$
8.50	5.90	6.10	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

Since the right hand limit (RHL) and left hand limit (LHL) are equal to 9, therefore

$$\lim_{x \rightarrow 6} (5x - 21) = 9$$

3 Find the limit of the model given as;

$$\lim_{x \rightarrow 3^+} \frac{8-x}{|3-x|}$$

Soln-

$$\lim_{x \rightarrow 3^+} \frac{3-x}{|3-x|} = \lim_{x \rightarrow 0} \frac{3-(3+x)}{|3-(3+x)|} = \frac{-x}{x} = -1$$

Evaluate the limit of the model given as  $\lim_{x \rightarrow 3} \frac{x-3}{|x-3|}$

Soln

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

$$= \frac{3-3}{|3-3|} = \frac{0}{0}$$

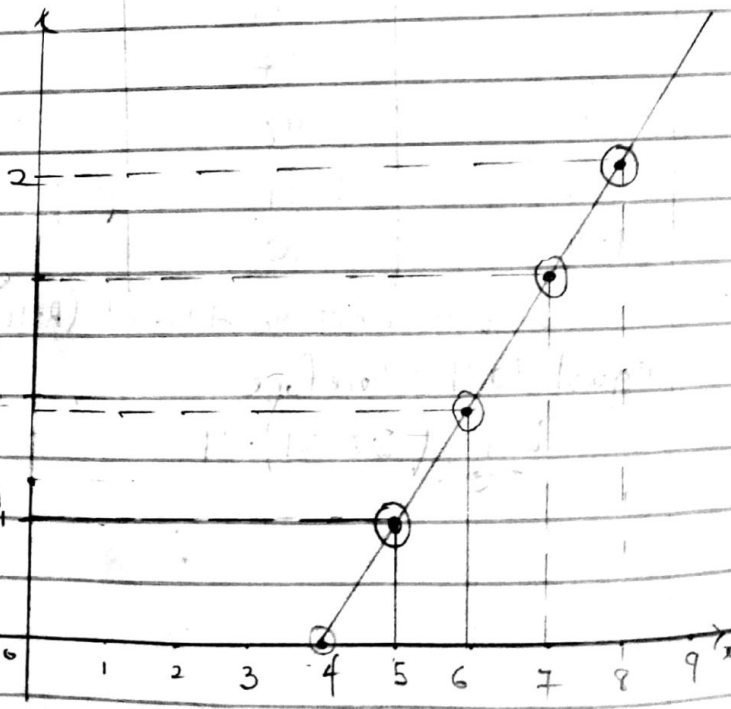
= Undefined

The limit does not exist.

Show that the function given in the equation below is continuous on the interval  $f(x) = \sqrt{x-4}$

Soln-

x	f(x) = $\sqrt{x-4}$
4	0
5	1.0
6	1.4
7	1.7
8	2.0



The graph above shows that the  $f(x) = \sqrt{x-4}$  at interval (4, 8) is continuous, because there was no point where the function was undefined, and the graph is a straight line graph