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BIOMEDICAL ENGINEERING

17/ENG08/004.

ENG 281 ASSIGNMENT

1. Given a function to be as an equation (1)

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

Since there is no function

to substitute the limit of x , we can say that

$$f(x) = \pi$$

$$x = \pi_0$$

$$\therefore 3.147$$

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

$f(x)$	$x - \delta$	$x = 6$	$x + \delta$	$F(x)$
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.

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

Solution.

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

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

$$= -x/x = -1.$$

4. Evaluate the limit of the model given as

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

Solution.

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

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

The limit does not exist.

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

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

