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COMPUTER ENGINEERING
17/ENG02/060
200 Level
ENG 281: ENGINEERING MATHEMATICS

1) Given the function $f(x) = \pi$. Find $\lim_{x \to 3} (x)$

Answer

There isn't a means of substitution for x so therefore it is undefined

2) Find the limit of the model equation given below $\lim_{x \to 3^+} \frac{3-x}{|3-x|}$

Solution

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

3) The model of a system has been developed by an engineer to be as given $f(x) = 5x - 21$. Given $\delta = 0.1$, and using a step of 0.01, demonstrate in tabular form that limit of the model as $x \to 6.9$

F(x)	x-6	x	x+6	F(x)
8.05	5.90	6	6.1	9.50
8.55	5.11		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		6.09	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	5.0		6.00	9.00

The limit is defined both on the LHS & RHS. so it's exist

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

$$\lim_{x \to 3^+} \frac{3-x}{|3-x|} = \frac{3-3+8x}{|3-3+8x|} = 1.$$

Evaluate the limit of the model given.

$$\lim_{x \to 3^+} \frac{x-3}{|x-3|} = \frac{3+8-3}{|3+8-3|} = \frac{8}{|8|} = 1$$

$$\lim_{x \to 3^-} \frac{x-3}{|x-3|} = \frac{3-8-3}{|3-8-3|} = \frac{-8}{|-8|} = \frac{-8}{8} = -1$$

$$\lim_{x \to 3} \frac{x-3}{|x-3|} = \frac{3-3}{|3-3|} = \frac{0}{0} = \text{Undefined.}$$

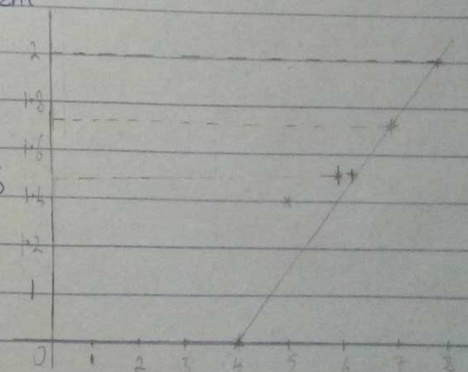
Show that the function given in equation $f(x) - \sqrt{x-4}$ continous on the interval (4, 8).

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

Sub 4 for $x = \sqrt{4-4} = \sqrt{0} = 0$ ...... (1)

Sub 8 for $x = \sqrt{8-4} = \sqrt{4} = 2$ ...... (2)

x Component	Y component
4	0
5	1.4
6	1.41
7	1.73
8	2.



From the graph figure 1.0, the function can be said to be Continous.