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

$$f(x) = \pi$$

Find $\lim_{x \to 3} f(x)$

Soln

$$f(x) = \pi$$

$$\lim_{x \to 3} = \pi$$

2) The model of a system has been developed b an Engineer to be given as in Eqn (2)

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

Given that $\delta = 0.1$, and using a step up demonstrate in tabular form the limit of the model as $x \to 6$ is equal to 9

Soln

f(x)	a − δ	a + δ	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
9.0	6.00	6.00	9.00

Since the left hand limit and the right hand limit are equal to 9, we can therefore say

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

3) Find the limit of the model equation given th

Equation 3

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

Soln

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

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

$$= \frac{-x}{x} = \frac{-1}{=}$$

4) Evaluate the limit of the model given in the equation (4) if it exist

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

Soln

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

∴, the limit does not exist.

5) Show that the function given in Equation 5 $f(x) = \sqrt{x-4}$ is continuous on the interval 4, 8.

Soln

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