

UWAZIE PRECIOSUYN

CHEMICAL ENGINEERING

17/ENG01/032

ENG 281

ASSIGNMENT

1) Given a function to be as in $f(x) = \pi$

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

Solution

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

2) The model of a system has been developed by an Engineer to be as given by the equation

$$f(x) = 3x - 21$$

Given that $\delta = 0.1$, and using a step of 0.01, demonstrate in tabular form of the model as $x \rightarrow 6$ is equal to 9

Solution

L_n	$a - \delta$	$a + \delta$	L_n
8.5	5.90	6.1	9.5
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 and left hand limit are equal to 9 there

$$\lim_{x \rightarrow 6} (3x - 21) = 9$$

3 find the limit of the model given as

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

Solution

$$\begin{aligned} \lim_{x \rightarrow 3^+} \frac{3-x}{|3-x|} &= \lim_{h \rightarrow 0} \frac{3-(3+h)}{|3-(3+h)|} \\ &= \frac{3-3-h}{|3-3-h|} = \frac{-h}{h} = -1 \end{aligned}$$

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

Solution

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

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

$$= \frac{0}{0}$$

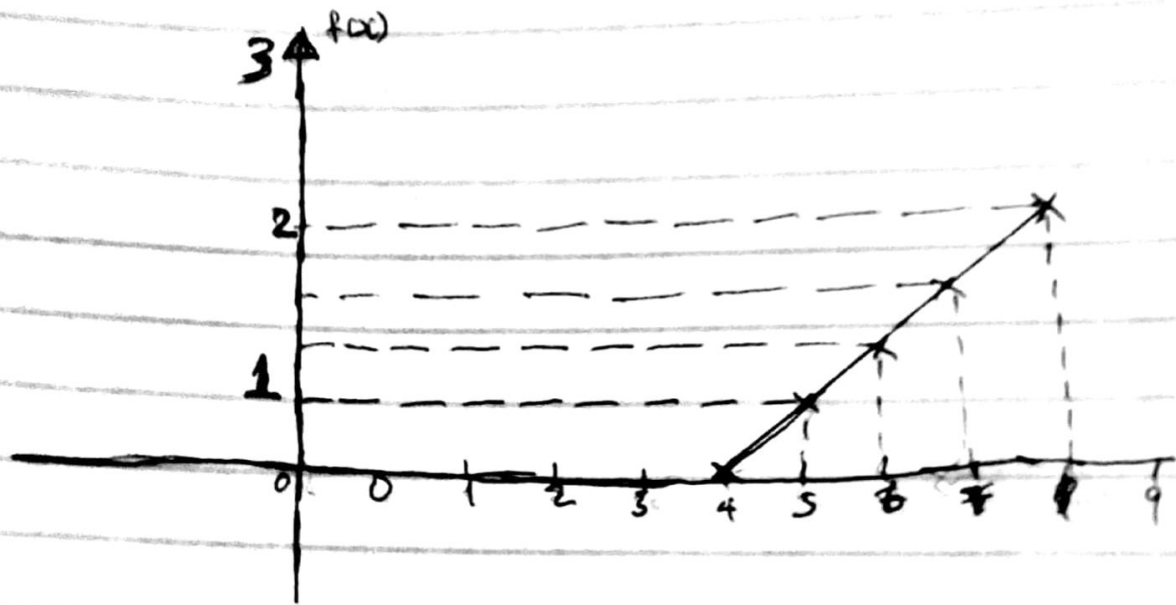
= Undefined

The limit does not exist

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

Solution

x	$f(x) = \sqrt{x-4}$
4	0
5	1
6	1.4
7	1.7
8	2.0



The graph above shows that the function $f(x) = \sqrt{x-4}$ at interval $[4, 8]$ continuous because there are function was undefined.