NAME: [illegible]
DEPT: Petroleum Engineering
MATRIC: 17/ENG07/[illegible]

1. Given a function to be as in $f(x) = \sqrt{x}$. Find $\lim_{x \to 3} f(x)$

Solution

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

2. The model of a system has been developed by an engineer to be as given in the equation:

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

Given that [illegible] and using a step of 0.01, demonstrate in tabular form, the model of $x \to 6$ equal to 9.

Solution

lim	$x \to 6$	6	$6 \leftarrow x$	lim
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, therefore $\lim_{x \to 6} (5x - 21) = 9$

3. Find the limit of the model given as $\lim_{x \to 3} = \frac{3-x}{|3-x|}$

Soln

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

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

4 Evaluate the limit of the model given as $\lim_{x \to 3} \frac{x-3}{|x-3|}$ if it exists.

Soln

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

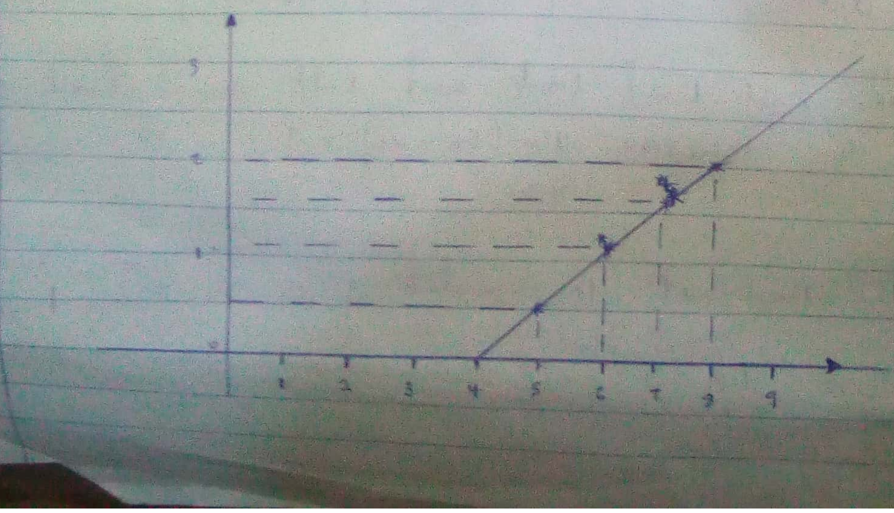
The limit does not exist.

5 Show that the function given in the equation below is continous on the internal $(4, 8)$.

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

Soln

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



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