

Principles of Engineering Physics  
 Mathematics / Composite Engineering

1.  $f(x) = A$ , find  $\lim_{x \rightarrow \infty} f(x)$

$\lim_{x \rightarrow \infty} f(x) = A$

$\lim_{x \rightarrow -\infty} f(x) = A$

2. The model of a system has been developed by an engineer to be given as  $x$

$f(x) = 5x - 2$

Given that  $0.1$  and using a step  $0.01$ , demonstrate a tabular form that the limit of the model as  $x \rightarrow \infty$  is equal

$f(x)$	$x - 0$	$x + 0$	$f(x)$
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 & left hand limit are equal to 9

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

$$x = 6$$

$$\lim_{x \rightarrow \infty} \frac{3 - 2x}{(3 - 2x)} = \lim_{x \rightarrow \infty} \frac{5 - (3 + 2x)}{(3 - (3 + 2x))} = \frac{-2x}{-2x} = -1$$

4 Evaluate the limit of the model given as

$$\lim_{x \rightarrow 3} \frac{x - 3}{(x - 3)}$$

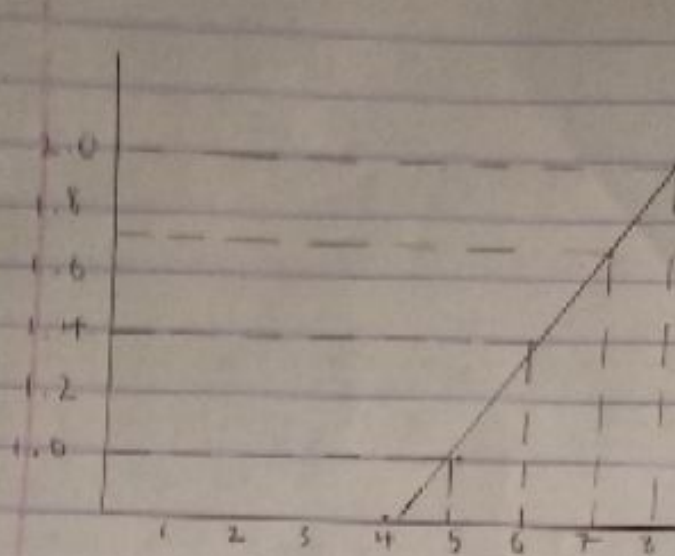
$$x \rightarrow 3 \quad \frac{x - 3}{(x - 3)}$$

$$\lim_{x \rightarrow 3} \frac{x - 3}{(x - 3)}$$

$$x \rightarrow 3 \quad \frac{x - 3}{(x - 3)}$$

$$\lim_{x \rightarrow 3} \frac{3 - 3}{(3 - 3)} = \frac{0}{0} \quad \text{The limit does not exist}$$

x	f(x) $\sqrt{x} + 1$
4	0
5	1.0
6	1.4
7	1.7
8	2.0



The graph shows that  $f(x)$  is continuous on the interval  $(4, 8)$  because there was no point where the function was undefined and the graph is a straight line graph.