Department of Electrical Electronics Engineering

FAROUQ

17/ENG04/001

1.) $\lim_{x \to 3} f(x)$

$f(x) = \bar{x}$.

$\lim_{x \to 3} \bar{x} = \bar{x}$.

2.) $\lim_{x \to 6} f(x) =$

$\lim_{x \to 1} (5x - 21)$

$x \to 6$	$x \to 6$	$f(x)$
5.9	6.1	9.5
5.09	6.01	9.05
5.009	6.001	9.005
5.0009	6.0001	9.0005
5.00001	6.00001	9.00005
5.000009	6.000001	9.000005
5.0000009	6.0000001	9.0000005

Hence $f(x) = 5x - 21$ tends towards 9 as $x \to 6$

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

$\lim_{H \to 0} \left(\frac{3 - (3+h)}{3 - (3+h)} \right) = \frac{0}{5}$

Limit is indeterminate at the right hand limit

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

$x > 3$

$$\lim_{h \to 0^+} \left[\frac{(3+h)-3}{|(3+h)-3|} \right]$$

$$\frac{3-3}{3-3} = \frac{0}{0} \text{ indeterminate}$$

$x < 3$

$$\lim_{h \to 0^-} \left[\frac{(3-h)-3}{-(3-h-3)} \right]$$

$$= \frac{0}{0} \text{ indeterminate}$$

Hence limits doesn't exist ~~at~~ from both left and right hand limit

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b.) at point $x = 4$.

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

$$\lim_{x \to 4} \sqrt{x-4} = \sqrt{4-4}$$

$$= \sqrt{0} = 0$$

$$\lim_{x \to 4^+} \sqrt{x-4} = \sqrt{8-4}$$

$$= \sqrt{4}$$

$$= 2$$

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

$$= \sqrt{4-4} = \sqrt{0} = 0$$

$$f(x) = \sqrt{8-4}$$

$$= \sqrt{4} = 2$$

$$\lim_{x \to (4,8)} f(x) = f(4,8)$$

Hence $f(x)$ is continuous at $(4, 8)$