

Name - Arun Kumar Balaji
Department - Mathematics
Matric No - 1716016051009

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

$$f(x) = \pi$$

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

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

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

x	$f(x)$
6.1	9.5
6.01	9.05
6.001	9.005
6.0001	9.0005
6.00001	9.00005
6.000001	9.000005
6.0000001	9.0000005

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

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

$$\frac{3 - (3+h)}{3 - (3+h)} = \frac{0}{0}$$

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

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

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

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

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

Since limits don't exist at ~~limit~~ from both left and right hand
limit

b.) at point $x=4$.

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

$$\lim_{x \rightarrow 4} \sqrt{x-4} = \sqrt{4-4} = \sqrt{0} = 0$$

$$\lim_{x \rightarrow 4} \sqrt{x-4} = \sqrt{8-4} = \sqrt{4} = 2$$

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

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

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

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

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

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