$x < 0$

$$\lim_{x \to 0^-} \left[\frac{([3-x]-3)}{([3-x]-3)} \right] = \frac{3-3}{3-3} = 0 \text{ ; indeterminate}$$

$\therefore$ The limit doesn't exist from the left to the right hand limit

5 $f(x) = \sqrt{x-4}$ (intervals 4,8)

At $x = 4$

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

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

$= \sqrt{0}$

$= 0$

$f(x) = \sqrt{4-4} = \sqrt{0}$

At $x = 8$

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

$= \sqrt{4}$

$= 2$

$f(x) = \sqrt{8-4} = 2$

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

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

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Mechatronics Engineering
Eng 281

1) $f(x) = \pi$

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

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

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 $f(x) = 5x - 21$

3 $\lim_{x \to 3^+} \frac{3-x}{|3-x|} = \frac{3-(3+x)}{3-(3+x)} = \frac{0}{0}$

The limit at the right hand side is indeterminate

4 $\lim_{x \to 3} \frac{x-3}{|x-3|}$

$x \angle 0$

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

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