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 ENG 281
 Electrical Electronics Engineering
 17/ENG04/014.

1) $f(x) = x$, find $\lim_{x \rightarrow 2} f(x)$

Soln

$f(x) = x$
 $x \rightarrow 3$

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

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

$\lim_{x \rightarrow 6} [5x - 21]$

let $\delta = 0.1$

$f(x)$	$x - \theta$	x	$x + \delta$	$f(x)$
8.50	5.90	6	6.10	9.50
8.55	5.91	6	6.09	9.45
8.60	5.92	6	6.08	9.40
8.65	5.93	6	6.07	9.35
8.70	5.94	6	6.06	9.30
8.75	5.95	6	6.05	9.25
8.80	5.96	6	6.04	9.20
8.85	5.97	6	6.03	9.15
8.90	5.98	6	6.02	9.10
8.95	5.99	6	6.01	9.05
9.00	6.00	6	6.00	9.00

From the table, the left hand and right hand limit, all approach 9 therefore we can say $\lim_{x \rightarrow 6} (5x - 21) = 9$

③ Find the limit of the model equation given in equation 3

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

Soln

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

$$\approx \lim_{h \rightarrow 0} \frac{3-(3+h)}{|3-(3+h)|}$$

$$\approx \frac{3-3-h}{3-3-h}$$

$$\approx \frac{-h}{|-h|}$$

$$\approx \frac{-h}{h}$$

$$= -1$$

4) Evaluate the limit of the model given the equation 4) if it exists

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

$$\approx \frac{3-3}{|3-3|}$$

$$\approx \frac{0}{0}$$

undefined

The limit does not exist

5) Show that function given in equation 5.

$f(x) = \sqrt{x-4}$ is continuous on interval $[4, 8]$

at point $x = 4$

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

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

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

at point $x = 8$

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

$$= \sqrt{4}$$

$$= 2.$$

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

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

$$= 0$$

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

$$x \rightarrow 4, 8$$

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

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

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