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17/ENG 02/052

Computer Engineering.

ENG 281

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

$x \rightarrow a$

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

$\lim_{x \rightarrow a} \sqrt{x} = \sqrt{a}$

$x \rightarrow 3$

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

$x \rightarrow 6$

$f(x) = (5x - 21)$

$x \rightarrow 6$

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. $\lim_{x \rightarrow 3} 3 - x$

$3 - x$

$x \rightarrow 3$

$3 - 3$

lim $f(x)$

$x \rightarrow 6$

lim $(5x - 21)$

$x \rightarrow 6$

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

3
lim $\frac{3-x}{3-2x}$
 $x \rightarrow 3$

$$\lim \left(\frac{3 - (3+x)}{3 - (3+2x)} \right) = \frac{0}{0}$$

Limit is indeterminate of right hand limit.

$$4 \quad \lim_{x \rightarrow 3} \frac{x-3}{|x-3|} \quad x \neq 0$$

$$\lim_{x \rightarrow 0^+} \left[\begin{array}{l} (3+h) - 3 \\ (3+h) - 3 \end{array} \right]$$

$$x < 0 \quad \left| \begin{array}{l} 3-h - 3 \\ 3-h - 3 \end{array} \right.$$

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

Hence limit doesn't exist from both left and right hand limit.

5 At point $x = 4$

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

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

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

~~(7, 8)~~

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

$$x \rightarrow (4, 8)$$

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