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ENG 281

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

Soln

$f(x) = \pi$

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

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

Soln

$\delta = 0.1$, Step: 0.01

	x	f(x)
$5(6.1) - 21 = 9.5$	6.1	9.5
$5(6.01) - 21 = 9.05$	6.01	9.05
$5(6.001) - 21 = 9.005$	6.001	9.005
$5(6.0001) - 21 = 9.0005$	6.0001	9.0005
$5(6.00001) - 21 = 9.00005$	6.00001	9.00005
$5(6.000001) - 21 = 9.000005$	6.000001	9.000005
$5(6.0000001) - 21 = 9.0000005$	6.0000001	9.0000005

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

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

Solution

$\therefore \lim_{x \to 3^+} \frac{3 - x}{|3 - x|} * \frac{3 - (3 + h)}{3 - (3 + h)} * \frac{3 - 3 - h}{3 - 3 - h}$

$= \frac{0+h}{0+h} = \frac{h}{h}$ hence $h \to 0 = 0/0$

∴ The limit is Indeterminate at the right hand limit.

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

∴ $x < 0$

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

where $h \to 0$

At $x \geq 0$

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

$= \frac{3-3}{3-3} = 0/0$ Indeterminate

∴ $0/0$ i.e Indeterminate form

∴ The limits do not exist from both left hand and right hand limit.

Show that $f(x) = \sqrt{x-4}$ is Continuous On Interval $[4, 8]$

Soln

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

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

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

At $x \to 8 = \sqrt{8-4} = \sqrt{4} - 2$

∴ Hence $f(x)$ is Continuous at $(4, 8$