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Computer Engineering

1 Given a function $f(x) = x$
find $\lim_{x \to 3} f(x)$

Since there is no function to substitute the limit of x, we can say $f(x) = x$
$x = \pi = 3.142$

$f(x)$	$x - \delta$	$x = 6$	$x + \delta$	$f(x)$
8.50	5.90		6.10	9.50
8.55	5.91		6.09	9.45
8.60	5.92		6.08	9.40
8.65	5.93		6.07	9.35
8.70	5.94		6.06	9.30
8.75	5.95		6.05	9.25
8.80	5.96		6.04	9.20
8.85	5.97		6.03	9.15
8.90	5.98		6.02	9.16
8.95	5.99		6.01	9.05
9.00	6.00		6.00	9.00

Since the Limits are defined both in the LHS and RHS so it can be said the Limit is real and thus exists.

3 Find the Limit of the modal question given below:

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

$$\lim_{x \to 3^+} \frac{3-x}{|3-x|} = \frac{3-(3-\delta)}{|3-(3+\delta)|} = \frac{3-3-8}{|3-3-\delta|}$$

$$= \frac{-\delta}{|-\delta|} = \frac{-\delta}{\delta} = -1$$

4 Evaluate the Limit of the model given

$$\lim_{x \to 3} \frac{x-3}{|x-3|} = \frac{3-3}{|(3)-3|} = \frac{0}{0} \text{ (undefined)}$$

Since $\lim_{x \to 3} \frac{x-3}{|x-3)}$ is undefined we

Substitute $(3+\delta)$ and $(3-\delta)$

$$\therefore \lim_{x \to 3^+} \frac{x-3}{|x-3|} = \frac{(3+\delta)-3}{|(3+\delta)-3|} = \frac{\delta}{|\delta|} = 1$$

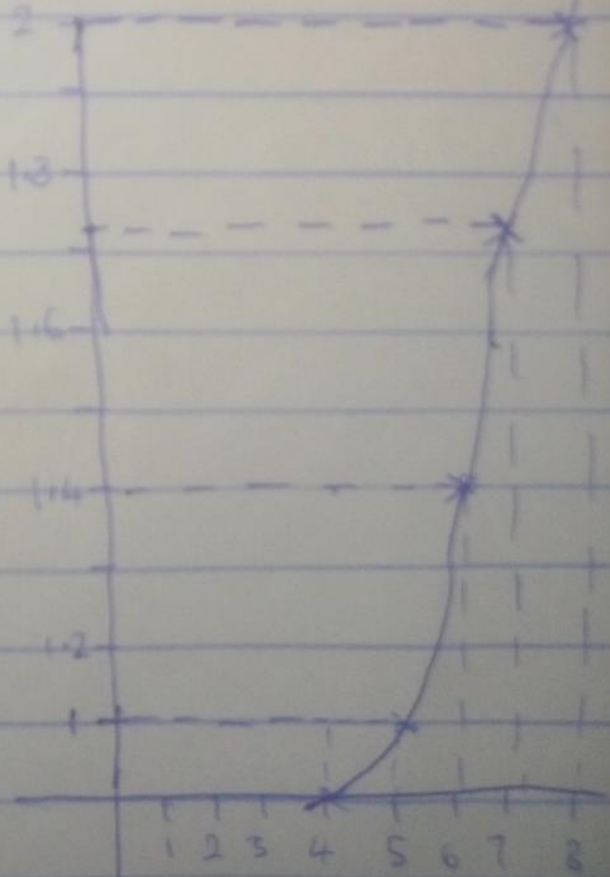
$$\lim_{x \to 3^-} \frac{x-3}{|x-3|} = \frac{(3-\delta)-3}{|(3-\delta)-3|} = \frac{-\delta}{\delta} = -1$$

Therefore since the RHS and LHS Limits do not corellate the Limit of $\frac{x-3}{|x-3|}$ as the equation tends to 3 doesn't exist

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

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

x	$f(x) = \sqrt{x-4}$
4	0
5	1.0
6	1.41
7	1.73
8	2



i) Given a function = $\bar{\pi}$

$\lim_{x \to 3} f(x)$

$\bar{\pi} = \bar{x} = 3.147$