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COMPUTER ENGINEERING

17/ENG02/068.

1) Given a function $f(x) = \pi$

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

$f(x) = \pi = 3.142$

Since there is no function to substitute to the limit of x

② $f(x)$	$x-\delta$	$x=6$	$x+\delta$	$f(x)$
8.50	5.90	$x=6$	6.10	9.50
8.55	5.91	$x=6$	6.09	9.45
8.60	5.92	$x=6$	6.08	9.40
8.65	5.93	$x=6$	6.07	9.35
8.70	5.94	$x=6$	6.06	9.30
8.75	5.95	$x=6$	6.05	9.25
8.80	5.96	$x=6$	6.04	9.20
8.85	5.97	$x=6$	6.03	9.15
8.90	5.98	$x=6$	6.02	9.10
8.95	5.99	$x=6$	6.01	9.05
9.00	6.00	$x=6$	6.00	9.00

Since the limits are defined both on the L.H.S and R.H.S so it can be said the limit is real and it exists.

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

$$= \frac{3-3-\delta}{|3-3-\delta|}$$

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

4 $\lim_{x \to 3} \frac{x-3}{|x-3|} = \frac{(3)-3}{|(3)-3|} = \frac{0}{0}$ (undefined)

Since $\lim_{x \to 3} \frac{x-3}{|x-3|}$ is undefined we substitute ~~for~~ $(3+\delta)$ and $(3-\delta)$ for x

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

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

Since R.H.S and L.H.S Limit do not correlate the Limit of $\frac{x-3}{|x-3|}$ as the equation tends to 3 doesn't exist

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

Sub 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