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 19/ECE01050  
 Engineering Mathematics  
 Electrical Engineering

1) Given a function  $f(x) = x$  for  $\lim_{x \rightarrow 3} f(x)$   
 Since there is no function to substitute the limit of  $x$ , we can  
 say that  $f(x) = x$   
 $x = 3$   
 $= 3.47$

2) The motor of a system

$f(x)$	$x = 5$	$x = 6$	$x = 7$	$f(x)$
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	9.10
8.95	5.99		6.01	9.05
9.00	6.00		6.00	9.00

Since the limits are defined both on the left and right sides  
 can be said the limit is real and thus exists.

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

$$\begin{aligned}
 \lim_{x \rightarrow 3^+} \frac{3-x}{|3-x|} &= \lim_{x \rightarrow 3^+} \frac{3 - (3+\Delta)}{|3 - (3+\Delta)|} = \frac{3-3-\Delta}{|3-3-\Delta|} \\
 &= \frac{-\Delta}{|-\Delta|} = \frac{-\Delta}{-\Delta} = 1
 \end{aligned}$$



$$\textcircled{4} \lim_{x \rightarrow 3} \frac{x-3}{|x-3|}$$

$$\lim_{x \rightarrow 3} \frac{x-3}{|x-3|} = \frac{(3)-3}{|(3)-3|} = \frac{0}{0} \text{ Undefined.}$$

Since this  $\lim_{x \rightarrow 3} \frac{x-3}{|x-3|}$  is Undefined we substitute.

$$\text{LSD} \Rightarrow (3-\Delta)$$

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

$$\lim_{x \rightarrow 3^-} = \frac{(3-\Delta)-3}{|(3-\Delta)-3|} = \frac{-\Delta}{|\Delta|} = -1$$

$$\lim_{x \rightarrow 3^+} \frac{x-3}{|x-3|} = \frac{(3+\Delta)-3}{|(3+\Delta)-3|} = \frac{\Delta}{\Delta} = 1$$

∴ Since the RHS and LHS @ ~~3~~ are not corresponding then we say the  $\lim_{x \rightarrow 3} \frac{x-3}{|x-3|}$  does not exist.

⑤  $f(x) = \sqrt{x-4}$  is continuous on the interval  $(4, 8)$

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

Sub 5 for x  $f(x) = \sqrt{5-4} = \sqrt{1} = 1$

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

