

AZANOR OGHEWESIPU ANIXONY

17/ENG09/006

PETROLEUM ENGINEERING

ENGE 251

- ① Given a function to be as in Equation (1)

$$f(x) = \pi$$

Find  $\lim_{x \rightarrow 3} f(x)$

The limit doesn't exist.

- ② The model of a system has been developed by an Engineer to be as given in Equation (2)

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

Given that  $\delta = 0.1$ , and using a step of 0.01, demonstrate in tabular form, that the limit of the model as  $x \rightarrow 6$  is equal to

L.H.S		R.H.S	
$5x - 6$	$f(x)$	$x + 8$	$f(x)$
5.4	5.5	6.1	9.5
5.41	5.55	6.09	9.45
5.42	5.6	6.08	9.4
5.43	5.65	6.07	9.35
5.44	5.7	6.06	9.3
5.45	5.75	6.05	9.25
5.46	5.8	6.04	9.2
5.47	5.85	6.03	9.15
5.48	5.9	6.02	9.1
5.49	5.95	6.01	9.05
6	9	6.00	9

- ③ Find  $\lim_{x \rightarrow 3} \frac{3-x}{|3-x|}$   
ATS form ( $x \rightarrow 3^+$ )  
 $x = 3 + 0.1$   
 $= 3.1$

$$\therefore \lim_{x \rightarrow 3^+} \frac{3-3.1}{|3-3.1|}$$

$$= \frac{-0.1}{|-0.1|}$$

$$= \frac{-0.1}{0.1}$$

$$= -1 //$$

④ Evaluate the limit of the model given in Equation ③, if it exists

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

L.H.S

$$x = 3 - 0.1$$

$$= 2.9$$

R.H.S

$$x = 3 + 0.1$$

$$= 3.1$$

$\therefore$  R.H.S

$$\lim_{x \rightarrow 3^+} \frac{3.1-3}{|3.1-3|} = \frac{0.1}{0.1} = 1$$

L.H.S

$$\lim_{x \rightarrow 3^-} \frac{2.9-3}{|2.9-3|} = \frac{-0.1}{|-0.1|} = -1$$

$\therefore$  The limit does not exist because L.H.S  $\neq$  R.H.S

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

continuity (4,8)  $\rightarrow$  4, 5, 6, 7, 8

$$\text{If } x=4$$

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

$$= 0$$

$$x=5$$

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

$$= 1$$

$$x=6$$

$$f(6) = \sqrt{6-4}$$

$$= 1.4$$

$$x=7$$

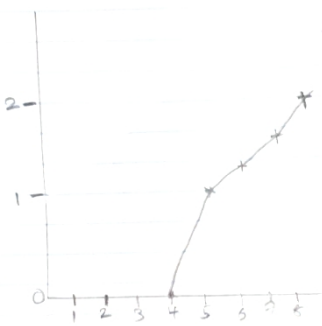
$$f(7) = \sqrt{7-4}$$

$$= 1.7$$

$$x=8$$

$$f(8) = \sqrt{8-4}$$

$$= 2.$$



Scale: 1 cm to 1 unit  
+ 1 cm to 1 unit