

Name

Ezeigbo Chimezie Jahn

Matric No

18/ENG04/038

Dept

Elect/Elect

ENG 281

a) Show that the limit  $x \rightarrow 0$  is  $a/b$

$$f(x) = \frac{\sin ax}{bx}$$

plating  $x \rightarrow 0$

$$\frac{\sin a(0)}{b(0)} = \text{indeterminate}$$

By applying L'Hopital

$$\frac{\sin ax}{bx} = \frac{a \cos ax}{b}$$

~~Therefore~~ plating  $x = 0$

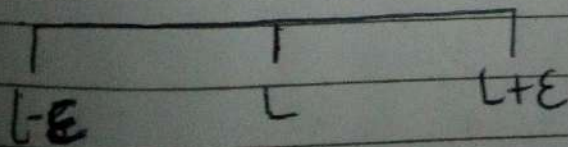
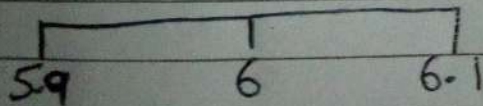
$$\frac{a \cos 0}{b} = \frac{a+1}{b} = \frac{a}{b}$$

Hence  $x \rightarrow 0$  of  $f(x) = a/b$

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

$$\delta = 0.1, \Delta \delta = 0.01$$

$$x \rightarrow 6$$



L-ε	a-r	a	a+r	L+ε
8.50	5.9	6	6.1	9.5
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

c)  $[-5, 5]$

$$f(x) = (25 - x^2)^{1/2}$$

at  $x = -5$

$$f(-5) = (25 - (-5)^2)^{1/2}$$

$$(25 - 25)^{1/2} = 0$$

at  $x = -4$

$$(25 - (-4)^2)^{1/2}$$

$$= (25 - 16)^{1/2} = 3$$

at  $x = -3$

$$(25 - (-3)^2)^{1/2} = 4$$

at  $x = -2$

$$(25 - (-2)^2)^{1/2} = 4.58$$

at  $x = -1$

$$(25 - (-1)^2)^{1/2} = 4.9$$

at  $x = 0$

$$(25 - 0)^{1/2} = 5$$

at  $x = 1$

$$(25 - (1)^2)^{1/2} = 4.9$$

at  $x = 2$

$$(25 - (2)^2)^{1/2} = 4.58$$

at  $x = 3$

$$(25 - (3)^2)^{1/2} = 4$$

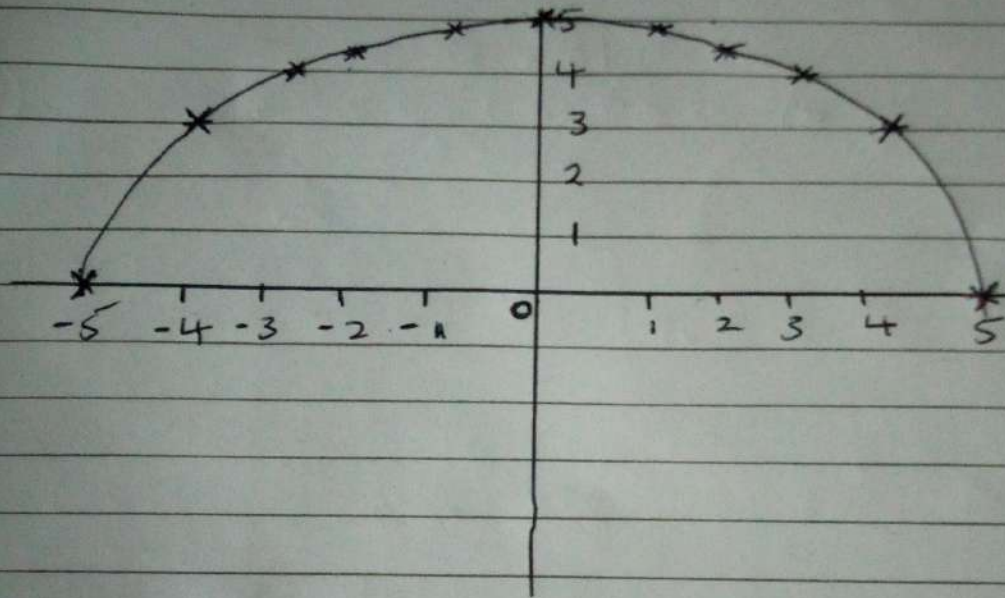
at  $x = 4$

$$(25 - (4)^2)^{1/2} = 3$$

at  $x = 5$

$$(25 - (5)^2)^{1/2} = 0$$

$x$	-5	-4	-3	-2	-1	0	1	2	3	4	5
$f(x)$	0	3	4	4.58	4.9	5	4.9	4.58	4	3	0



$\therefore$  the  $f(x)$  is Continuous