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COURSE : ENG 281 200L

MAT NO : 18/ENG04/070

DEPT : ELECT/ELECT.

Show that the limit $x \to 0$ is $\frac{a}{b}$

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

putting $x \to 0$

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

hence applying l'hopital's

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

$\lim x \to 0$

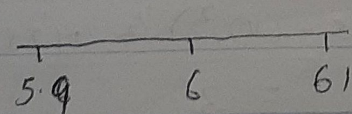
$$\frac{a\cos 0}{b} = \frac{a \times 1}{b} = a/b$$

hence $x \to 0$ if $fx = a/b$

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

$\varepsilon = 0.1$, $\Delta\Delta = 0.01$

$x \to 6$



$L-\varepsilon$	$a-\Delta$	a	$a+\Delta$	$L+\varepsilon$
8.50	5.90	6	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

$[-5,5]$

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

when $x = -5$

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

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

when $x = -4$

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

$= (24 - 16)^{1/2} = 3$

when $x = -3$

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

$= (25 - 9)^{1/2} = 4$

when $x = -2$

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

$= (25 - 4)^{1/2} = 4.58$

when $x = -1$

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

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

when $x = 0$

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

when $x = 1$

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

when $x = 2$

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

$= 4.58$

when $x = 3$

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

$= (25 - 9)^{1/2} = 4$

when $x = 4$

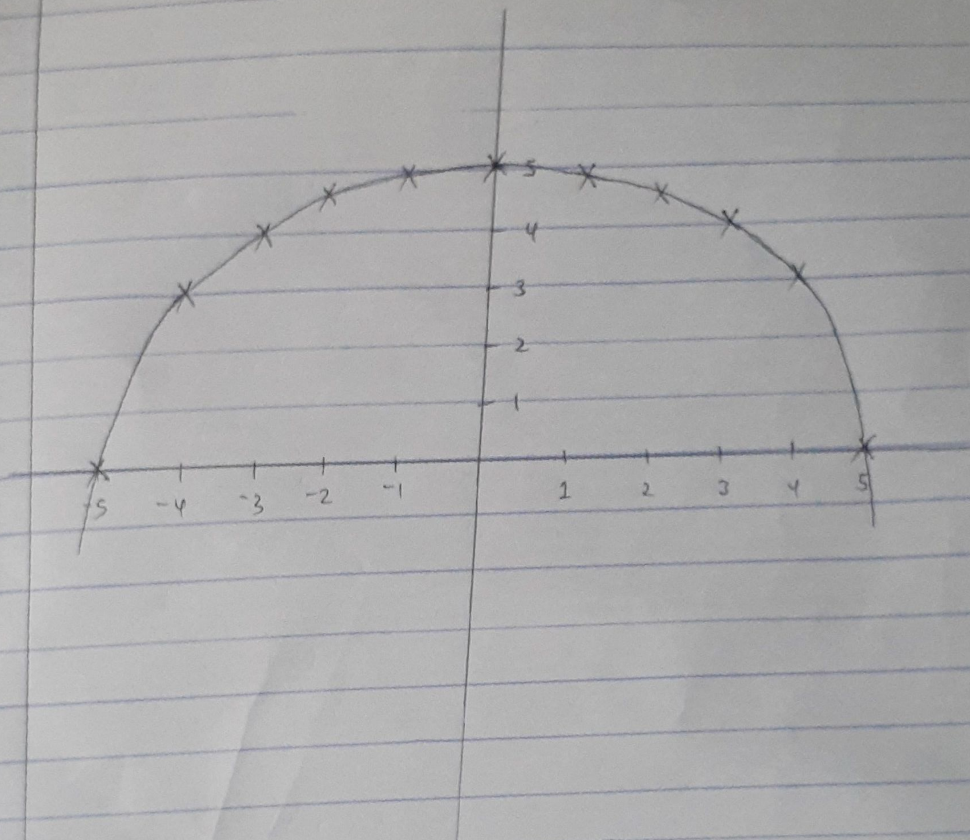
$(25 - (4)^2)^{1/2} = (25 - 16)^{1/2}$

$= 3$

when $x = 5$

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

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 ~~limit~~ function $f(x)$ is continuous