$x \to 0$

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

$= 5$

$x \to 1$

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

$= 4.89$

$x \to 2$

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

$= 4$

$x \to 3$

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

$= 4$

$x \to 4$

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

$= 3$

$x \to 5$

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

$= 0$

The function on the interval $[-5, 5]$ is continuous

x	$f(x)$
5.9	8.5
5.91	8.55
5.92	8.60
5.93	8.65
5.94	8.70
5.95	8.75
5.96	8.80
5.97	8.85
5.98	8.90
5.99	8.95
6.00	9.00

x	$f(x)$
6.1	9.5
6.09	9.45
6.08	9.40
6.07	9.35
6.06	9.30
6.05	9.25
6.04	9.20
6.03	9.15
6.02	9.10
6.01	9.05
6.00	9.00

c) Show whether the function given in the equation below is continuous on the interval $[-5, 5)$

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

Solution

$x \longrightarrow -5$

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

$= 0$

$x \longrightarrow -4$

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

$= 3$

$x \longrightarrow -3$

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

$= 4$

$x \longrightarrow -2$

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

$= 4.58$

$x \longrightarrow -1$

$f(x) = (25 - (-1)^2)^{1/2} = 4.89$ //

18IENG04028
ELECTRICAL ELECTRONICS
EBONG PRINCE VINCENT
ASSIGNMENT

a) Show that the function given in equation (1.2) as x approaches 0 is a/b

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

Solution

$$f(x) = \frac{\sin ax}{b(x)} = \frac{\sin a(0)}{b(0)} = \frac{0}{0}$$

$\therefore f(x) = \frac{\sin ax}{b(x)}$ is undefined

Applying l'hopitals rule

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

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

$$f(x) = \frac{a\cos a(0)}{b} = \frac{a}{b}$$

$\longrightarrow 0$

3.) The model of a system has been developed to be as given in equ (1.2) $f(x) = 5x - 21$

Given that $\delta = 0.1$ and $\Delta\delta = 0.01$, demonstate in a tabular form, that the limit of the model as $x \longrightarrow 6$ is equal to 9

Solution

$\delta = 0.1$, $\Delta\delta = 0.01$, $\varepsilon = 0.05$

$6 - 0.1 = 5.9$ (left hand side)

$6 + 0.1 = 6.1$ (right hand side)

$9 - 0.5 = 8.5$ (left hand side)

$9 + 0.5 = 9.5$ & Right hand side)