Akinyemi Oluwapelumi Abraham
18/ENG03/1010
Electrical engineering

a) Lim f(x) = $\frac{a}{b}$ for $f(x) = \frac{\sin ax}{bx}$

By direct substitution

$\lim \frac{\sin ax}{bx} = \frac{\sin a(0)}{b(0)} = \frac{0}{0}$ = undetermined

Apply L'Hopital's rule and substitute

$\lim_{x \to 0} \frac{\sin ax}{bx} = \frac{a \cos ax}{b}$

$\lim_{x \to 0} = \frac{a \cos a(0)}{b} = \frac{a}{b} = (\cos 0 = 1)$

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

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

$d = 0.1 \quad \Delta d = 0.01$

let x_2 and x_1 be values of x such that

$x_2 - x_1 = d = 0.1$, then $F(x_2) - F(x_1) = \xi$

$\xi = 5x_2 - 21 - [5x_1 - 21]$

$\xi = 5x_2 - 5x_1 - 21 - 21$

$\xi = 5(x_2 - x_1)$

$\xi = 5 \times d$

$\xi = 5 \times 0.1$

$= 0.5 = 5 \times \Delta d = 5 \times 0.01 = 0.05$

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

x	fx
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