Mark - Adeyemi Victor.S

Elect/Elect 18/ENG04/048

17) $A = \int_a^b y\,dx$

Between two curves

$A = \int_a^b g\,dx - \int_a^b y_2\,dx$

$A = \int_1^2 3e^{2x} - \int_1^2 3e^{-x}$

$A = 3\left[e^{2x}/2\right]_1^2 - 3\left[-e^{-x}\right]_1^2$

$A = 3\left[e^4/2 - e^2/2\right] - 3\left[-e^{-2} - (-e^{-1})\right]$

$A = 70.814 - 3\left[-e^{-2} + e^{-1}\right]$

$A = 70.814 - 3[0.233$

$A = 70.115$ units

2.) $A = \int_a^b y\,dx \quad a = 0 \quad b = 10$

$dx = 2x = \pi/5 \sin \pi/10 + d\epsilon$

$A = \int_0^{10} 8\sin \pi/10\, t = (2 + \pi/10 t)$

$= \int_0^{10} 4\sin \pi/10 t (2 + \pi/5 \sin(n t \pi/10)/5)$

$A = \int_0^{10} 4 \sin \pi/10 t + \int_0^{10} \frac{2\pi \sin\frac{(n+2)}{10}}{5}$

$= 4\int_0^{10} \sin \pi/10 t + 2x/5 \int_0^{10} \sin(\pi t/10)^2$

$\left[-40\cos\frac{\pi t}{10}\right] + \left[\frac{2\pi}{5} \cdot \pi t - 5\sin\left(\frac{\pi t}{5}\right)\right]_0^{10}$

$= \left[\left(\frac{-40\cos\pi(10)}{10} + \pi(10) - 5\sin\frac{(10\pi)}{5}\right) - 10\cos\left(\frac{0}{10}\right) + \pi(0) - 5\sin\right.$

$= \left[\frac{40}{\pi} + 2\pi\right] - \left[\frac{-40}{\pi}\right]$

$= \frac{40}{\pi} + 2\pi + 40/\pi$

$= \frac{80}{\pi} + \frac{2\pi}{\pi} - \frac{80 + 2\pi}{\pi}$

$= 31.745$ square unit