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Section - A

Subject Calculus

Submitted to Ma'am Shumaila

Dated. 19/9/20

Day

Q) $\int_2^3 t \sin t^2 \, dt$

Sol:- $\int_2^3 t \sin t^2 \, dt$

$= \frac{1}{2} \int_4^9 \sin x \, dx$

$= \frac{1}{2} (-\cos x) \Big|_4^9$

$= \frac{1}{2} (-\cos 9 - (-\cos 4))$

$= -\frac{1}{2} (0.98 - 0.99)$

$= -\frac{1}{2} (0.01)$

$= (0.002)$ Ans.

Let $t^2 = x$

Diff w.r.t t

$2t = \frac{dx}{dt}$

$2t \, dt = dx$

$t \, dt = \frac{dx}{2}$

$t^2 = x$

$t = 2$

$x = 4$

put $t = 3$

$x = 9$

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$$Q = \int_0^1 \frac{4t^3 - 2t^2 + 3t - 1}{2t^2 + 1}\, dt$$

Sol -

$$\int \left((2t - 1) + \frac{t}{2t^2 + 1} \right) dt$$

$$= \int_0^1 (2t - 1)\, dt + \int_0^1 \frac{t}{2t + 1}\, dt$$

$$= (t^2 - t)\Big|_0^1 + \frac{1}{4} \int_0^1 \frac{4t}{2t^2 + 1}\, dt$$

$$= (1 - 1) - 0 + \frac{1}{4} \{ \ln(5 + 1) - \ln(1) \}$$

$$= 0 + \frac{1}{4} \{ \ln 6 - 0 \}$$

$$= \frac{1}{4} \ln 6$$

$$= 0.44$$

Baber Register

$$dt = \frac{dy}{4t}$$

① $\Rightarrow$ $\int_1^3 \frac{t(2y+1)}{y} \cdot \frac{dy}{4t} - 1$

$$\int_1^3 \frac{2y+1}{4y}\, dy - 1$$

$$= \frac{1}{4}\left[\int_1^3 \frac{2y\,dy}{y} + \int_1^3 \frac{1}{y}\, dy\right] - 1$$

$$= 1/4\left[2y|_1^3 + \ln y|_1^3\right] - 1$$

$$= 1/4\left[2(3) - 2(1) + \ln(3) - \ln(1)\right] - 1$$

$$= 1/4\left[6 - 2 + 1.0986\right] - 1$$

$$= 1/4\left[5.0986\right] - 1$$

$$= 1.27465 - 1$$

$$= 0.2746 \text{ Ans.}$$