Sheet #

LGS GROUP OF COLLEGES

A PROJECT OF LAHORE GRAMMAR SCHOOL

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Subject: Maths | Ex. No. | Date: 23/1/24

	A	B	C	D
1	●			
2		●		
3		●		
4		●		

Marks Obtained

Question # 2

(ii)

Sol: Given that

$xy - \ln x = c$

$d(xy - \ln x) = d(c)$

$d(xy) - d(\ln x) = 0$

$x\,dy + y\,dx - \frac{1}{x}dx = 0$

$x\,dy = \frac{1}{x}dx - y\,dx$

$x\,dy = \left(\frac{1}{x} - y\right)dx$

$x\,dy = \left(\frac{1 - xy}{x}\right)dx$

$\frac{dy}{dx} = \frac{1 - xy}{x^2}$

(iii)

Sol Given that

$\int \frac{(\sqrt{\theta} - 1)^2}{\sqrt{\theta}}\,d\theta$

$= \int \left(\frac{\theta + 1 - 2\sqrt{\theta}}{\sqrt{\theta}}\right) d\theta \quad = \int \frac{\theta}{\theta^{1/2}}\,d\theta + \int \frac{1}{\theta^{1/2}}\,d\theta - 2\int \frac{\theta^{1/2}}{\theta^{1/2}}\,d\theta$

$= \int \theta^{1/2}\,d\theta + \int \theta^{-1/2}\,d\theta - 2\int 1\,d\theta$

$= \frac{\theta^{3/2}}{3/2} + \frac{\theta^{1/2}}{1/2} - 2\theta + c$

$= \frac{2}{3}\theta^{3/2} + 2\theta^{1/2} - 2\theta + c$

(i)

Sol $y = \sqrt{x} \cdot 1$

$y + \Delta y = \sqrt{x + \Delta x}$

$\Delta y = y = \sqrt{x + \Delta x} - y$

$\Delta y = \sqrt{x + \Delta x} - (\sqrt{x})$

Question # 3

Sol Given that $\int \frac{\cos 2x - 1}{1 - \cos^2 x} dx$

$= \int \frac{-(1 - \cos 2x)}{1 - \cos^2 x} dx = \frac{-\int 2\sin^2 x \, dx}{\sin^2 x}$

$= -\int \tan^2 x \, dx$

$= -\int (\sec^2 x - 1) dx$

$= -\int \sec^2 x \, dx + \int 1 \, dx$

$= -\tan x + x + C$ Ans