Time hour **Sample Paper: Class XII** **MM 32**

Integration, Area Under The Curves & Differential Equations

1. Evaluate $\int \sin^2 x \, dx$ 1

2. Evaluate $\int_1^4 [2x] \, dx$ 1

3. Find the area of the parabola $y^2 = 4ax$ bounded by the latus rectum. 1

4. Write down the order and degree of differential equation $\left[1+\left(\frac{dy}{dx}\right)^3\right] = \frac{d^2y}{dx^2}$ 1

5. Evaluate $\int \frac{1}{(x-1)\sqrt{x^2-1}} dx$ 4

6. Prove that $\int_0^{\frac{\pi}{2}} (2\log\sin x - \log\sin 2x) \, dx = \frac{-\pi}{2}\log 2$ 4

7. Find the area of the region $\{(x, y): 0 \le y \le x^2 + 1, 0 \le y \le x + 1, 0 \le x \le 2\}$
4

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8. Solve the initial value problem: $\left(1+e^{2x}\right)dy+\left(1+y^2\right)e^x=0,\ y(0)=1$ 4

9. Evaluate $\int\frac{3+2\cos x+4\sin x}{\cos x+2\sin x+3}dx$ 6

10. Using integration, find the area of a triangle with vertices $(-1,0),(1,3)$ and $(3,1)$ 6

Paper by Pawan Kumar, St. Joseph's Convent School, Bathinda