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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 $\{(x, y): 0 \leq y \leq x^2 + 1, 0 \leq y \leq x + 1, 0 \leq x \leq 2\}$ 4

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

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