Class 12 Test: Application of Integral, Differential Equaiotions

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Maximum Marks:30 Duration: 60mins

1 mark Questions

1. Find the order and degree of the differential equation $x^2 \frac{d^2y}{dx^2} = \left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^4$.
2. Find the area bounded by the curve $y = -x + 5$, above the X-axis and between $x = 1$ and $x = 4$.

2 marks Questions

3. Prove that $y = (\sin^{-1} x)^2$ is solution of the differential equation

$$(1 - x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} - 2 = 0$$

3 marks Questions

4. Find the particular solution of the differential equation $\frac{dy}{dx} + 2y \tan x = \sin x$, given that $y = 0$ when $x = \frac{\pi}{3}$
5. Solve the differential equation: $xdy - ydx = \sqrt{x^2 + y^2}\, dx$, given that $y = 0$ when $x = 1$

5 marks Question

6. Using integration, find the area of the region in the first quadrant enclosed by the X-axis, the line $y = x$ and the circle $x^2 + y^2 = 32$
7. Using integration, find the area of the triangle ABC, whose vertices are $A(2,5), B(4,7)$ and $C(6,2)$
8. Find the area of the region $\{(x,y): y^2 \leq 6ax$ and $x^2 + y^2 \leq 16a^2\}$ using method of integration.
9. Show that the differential equation $\left(xe^{y/x} + y\right)dx = xdy$ is homogeneous. Find the solution of the differential equation.

Solution to the Test

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