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Solve the following differential equation: Q1.

$$rac{dy}{dx} - rac{y}{x} = 2x^2$$

Q5.

Q8.

3 Marks

Find the particular solution of the differential equation $x \frac{dy}{dx} + x \cos^2\left(\frac{y}{x}\right) = y$; given that when $x=1, y=\frac{\pi}{4}$. **Q2.**

3 Marks

Find the particular solution of the differential equation $(y+3x^2) \frac{\mathrm{d}x}{\mathrm{d}y} = x$, given that y=1, when y=1. Q3.

3 Marks

Q4. Solve the following differential equation:

$$(1+e^{rac{y}{x}})\mathrm{d}y+e^{rac{y}{x}}\Big(1-rac{y}{x}\Big)\mathrm{d}x=0$$

3 Marks

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Solve the following differential equation: $(\tan^{-1} y - x)dy = (1 + y^2)dx$

3 Marks

3 Marks

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(ONE TIME FEES TODAY TO TILL EXAM)

Solve the following differential equation: **Q6**. $\sin x \frac{dy}{dx} + \cos xy = \cos x \sin^2 x$

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3 Marks

Solve the following differential equation: Q7.

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

 $x = 1, y = \frac{\pi}{2}$.

Find the particular solution of the differential equation given by $x^2 \frac{dy}{dx} - xy = x^2 \cos^2\left(\frac{y}{2x}\right)$, given that when

3 Marks

Find the general solution of the differential equation. Q9.

$$x \frac{dy}{dx} - y + x \sin \frac{y}{x} = 0.$$

3 Marks

Find the general solution of the differential equation $\frac{dy}{dx} = \frac{x^2 + y^2}{2xy}$. Q10.

3 Marks

Solve the differential equation: $\frac{dy}{dx} = \frac{x^2 + y^2}{xy}$. Q11.

3 Marks

3 Marks

Find the general solution of the differential equation $x \frac{\mathrm{d}y}{\mathrm{d}x} = y(\log y - \log x + 1)$. Q12.

3 Marks

Find the general solution of the differential equation: $\frac{dy}{dx} - \frac{2y}{x} = \sin \frac{1}{x}$. Q13.

Find the particular solution of the differential equation: $\frac{\mathrm{d}y}{\mathrm{d}x} = \sin(x+y) + \sin(x-y)$, given that when $x = \frac{\pi}{4}$, y = 0. Q14.

3 Marks

Find the general solution of the differential equation: Q15.

3 Marks

$$\frac{\mathrm{dx}}{\mathrm{dy}} = \frac{\mathrm{e}^{\frac{\mathrm{x}}{\mathrm{y}}\left(\frac{\mathrm{x}}{\mathrm{y}}-1\right)}}{1+\mathrm{e}^{\frac{\mathrm{x}}{\mathrm{y}}}}.$$

Find the particular solution of the differential equation $\frac{\mathrm{d}y}{\mathrm{d}x} + \cot x \cdot y = \cos^2 x$, given that when $x = \frac{\pi}{2}$, y = 0. Q16.

3 Marks

Find the general solution of the differential equation $ye^ydx = (y^3 + 2xe^y)dy$. Q17.

3 Marks

Find the particular solution of the differential equation Q18.

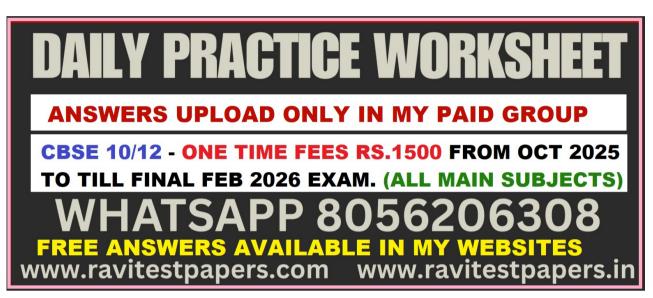
$$x rac{\mathrm{dy}}{\mathrm{dx}} = y - x an \left(rac{y}{x}
ight)$$
, given that $y = rac{\pi}{4}$ at $x = 1$.

3 Marks

Find the particular solution of the differential equation $x rac{dy}{dx} - y = x^2$. e^x , given y(1) = 0. Q19.

3 Marks

- **Q20.** Find the particular solution of the differential equation $\frac{dy}{dx} + \sec^2 x \times y = \tan x \times \sec^2 x$, given that y(0) = 0.
- Q21. Solve the differential equation given by $x\ dy-y\ dx-\sqrt{x^2+y^2}\ dx=0.$
- Q22. Form the differential equation of the family of curves $y = a \cos(x + b)$, where a and b are arbitrary constants. 3 Marks
- Q23. Form the differential equation of the family of curves $y = a \sin(x + b)$, where a and b are arbitrary constants. 3 Marks
- **Q24.** Form the differential equation of the family of curves $y = A\cos 2x + B\sin 2x$, where A and B are constants.
- Q25. Verify that y = A cos x b sin x is a solution of the differential equation. $\frac{d^2y}{dx^2} + y = 0.$ 3 Marks



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