# MATHS

# BOOKS - MODERN PUBLICATION

# DIFFERENTIAL EQUATIONS

## Problem

**1.** ___is not a solution of $\frac{d^2y}{dx^2} = 1$.

[dy/dx=5x,y=x^2/2,dy/dx=0]

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**2.** What is the integrating factor ofthe equation $y' + y\cot x = \cos ecx$ ?

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**3.** The degree of the differential equation satisfying $\sqrt{1-x^2} + \sqrt{1+y^2} = a(x-y)$ is____.

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**4.** what is the substitution to reduce $\frac{dy}{dx} + py = Qy^n$,n>2 to linear form.

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**5.** Write the particular solution of $\frac{dy}{dx} = \frac{1}{1+x^2}$,given that when x=0,y=1.

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**6.** solution of dy/dx=xy+x+y+1 is ___

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**7.** The differential equation for $y = ax^2 + b$ is___

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**8.** solve: $\frac{dy}{dx} = 2 + x, y(0) = 3$

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**9.** solve: $\frac{dy}{dx} = \cos(x + y).$

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**10.** solve: $\frac{dy}{dx} = \cos(x + y)$, given that $y = \sqrt{3}$ when $x = 1.$

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**11.** solve: $ydx - xdy = xydx$

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**12.** solve: $\left(1+y^2\right)xdx+\left(1-x^2\right)ydy=0$

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**13.** Find the differential equation for the family of curve $y=a\sin^{-1}x+b\cos^{-1}x$.

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**14.** solve: $\frac{dy}{dx}=(x-y)^2$

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**15.** solve: $e^{-x}\frac{d^2y}{dx^2} = x$

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**16.** solve: $\frac{dy}{dx} + \frac{1+y^2}{y} = 0$

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**17.** solve: $(x - \sin y)dy + (\tan y)dx = 0$

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**18.** Find the solution of the following differential equations:

$$\left(x^2 - y^2\right)dx + 2xydy = 0$$

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**19.** Find the solution of the following differential equations:

$$x(x + y)dy = \left(x^2 + y^2\right)dx$$

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