

## Differential Equation: Linear Differential Equation

your Name :

**Srivastava Classes**  
**Linear Differential Equation**

**Type :**  $\frac{dy}{dx} + P(x).y = Q(x)$  : I.F. =  $e^{\int P.x}$

**Solution is :**  $y.IF = \int Q.IF.x$

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1 Solve the following Differential equation :

$$(1 - x^2)\frac{dy}{dx} - xy = 1$$

2 Solve the following Differential equation :

$$x\frac{dy}{dx} + 2y = x^2 \log x$$

3 Solve the following Differential equation :

$$2\frac{dy}{dx} - \frac{y}{x} = \frac{y^2}{x^2}$$

4 Solve the following Differential equation :

$$\frac{dy}{dx} = x^3y^3 - xy$$

5 Solve the following Differential equation :

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

6 Solve the following Differential equation :

$$(x^3 - x)\frac{dy}{dx} - (3x^2 - 1)y = x^5 - 2x^3 + x$$

7 Solve the following Differential equation :

If  $\frac{dy}{dx} + 2y \tan x = \sin x$  and if only  $y = 0$  when  $x = \frac{1}{3}\pi$ , express  $y$  in terms of  $x$ .

8 Solve the following Differential equation :

$$y \log y dx + (x - \log y)dy = 0$$

9 Solve the following Differential equation :

$$\frac{dy}{dx} + xy = xy^2$$

10 Solve the following Differential equation :

$$\frac{dy}{dx}(x^2y^3 + xy) = 1$$

11 Solve the following Differential equation :

$$\frac{dy}{dx} = 1 - x(y-x) - x^3(y-x)^3$$

**12** Solve the following Differential equation :

$$\text{Solve : } y \log y \cdot dx + (x - \log y)dy = 0$$

**13** Solve the following Differential equation :

$$dx + xdy = e^{-y} \cdot \log y \cdot dy$$

**14** Solve the following Differential equation :

$$\text{Solve : } (1 + y^2)dx + (x - \tan^{-1}y)dy = 0$$