

the highest derivative is 3, hence the equation is in order 3 or we can say that the equation is in the third order.

In the equation,

$$\frac{\partial^2 t}{\partial x^2} + xt = \frac{\partial t}{\partial y}$$

the highest derivative is 2, hence the equation is in order 2 or we can say that the equation is in the second order.

degree of a differential equation

The degree of a differential equation is the highest power of the highest order derivative in the equation.

Example:

$$\frac{d^3 y}{dx^3} + \left(\frac{dy}{dx}\right)^4 + x^2 \frac{d^2 y}{dx^2} + y = 0$$

The equation is in order 3 and the power of its order is one, hence, the equation has a degree of one or we can say that the equation is in the 1st degree.

In the equation,

$$\left(\frac{d^2 y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^3 = 4x + y$$

The equation is in order 2, and the power of its order is two, hence the equation has a degree of two or we can say that the equation is in the second degree.

Preview from Notesale.co.uk
Page 3 of 3