

Determine order and degree (if defined) of differential equation $\left(\frac{d^2y}{dx^2}\right)^2 = \cos 3x + \sin 3x$.

Solution:

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

$$\Rightarrow \left(\frac{d^2y}{dx^2}\right)^2 - \cos 3x - \sin 3x = 0$$

Highest order derivative in the given differential equation is $\frac{d^2y}{dx^2}$. Its order is two.

It is a polynomial equation in $\frac{d^2y}{dx^2}$ and the power is 1. Its degree is 1.