



## Tutorial 5

### Question 1

State whether the following equations are separable or not.

a.  $\frac{dy}{dx} = y^2 x e^{3x+4y}$

b.  $3xy + (x - 3)y' = 0$

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



## Question 2

Show that the differential equation is separable and solve the equation.

$$(1 + x)dy - ydx = 0$$



### Question 3

Show that the differential equation is separable and solve the equation.

$$2xy + 6x + (x^2 - 4)y' = 0$$



### Question 4

Solve the IVP (Initial value problem)

$$(e^{2y} - y) \cos \frac{dy}{dx} = e^y \sin 2x$$

$$y(0) = 0$$



### Question 5

Solve the linear equation  $\frac{1}{x} \frac{dy}{dx} - 4y = 1$



### Question 6

Solve the linear equation  $x \frac{dy}{dx} - 4y = x^6 e^x$



### Question 7

Solve the IVP  $y' + y = x$

$$y(0) = 4$$