

Solve the following equations:

1.  $\frac{dy}{dx} = 2x$  (20%)

2.  $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 6y = 0$  (20%)

3.  $x^2 \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} + 2y = 0$  (20%)

4.  $\frac{dy}{dx} - 3y = 6$  (20%)

5.  $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 30e^{2x}$  (20%)