

Q3

$$\frac{dy}{dx} = 2yx + 4x$$

$$y(0) = 1$$

$$\frac{dy}{dx} = 2x(y+2) \rightarrow \int \frac{dy}{y+2} = \int 2x dx \quad \ln|y+2| = x^2 + C$$

$$y+2 = Be^{x^2} \Big|_{(0,1)} \rightarrow 1+2 = Be^0 \rightarrow B=3 \quad \therefore y = 3e^{x^2} - 2$$