A

Q.37 Given that there is a common solution to the following equations:

$$\mathbf{P}: y' + 2y = e^x y^2, \quad y(0) = 1,$$

$$\mathbf{Q}: y'' - 2y' + \alpha y = 0,$$

find the value of α and hence find the general solution of $\mathbf{Q}$.

A

Q.38 Let $f:\mathbb{R}\to\mathbb{R}$ be a twice differentiable function such that $f\left(\frac{1}{2^n}\right)=0$ for all $n\in\mathbb{N}$. Show that $f'(0)=0=f''(0)$.

A