

Sherjee 20 p. 0101

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Q2: $y = e^{3x} \cos x$, $\frac{d^2 y}{dx^2} - 6 \frac{dy}{dx} + 13y = 0$

$$\frac{dy}{dx} = \frac{d}{dx} (e^{3x} \cos x)$$

$$y = e^{3x} \cos x; \quad \frac{d^2 y}{dx^2} - 6 \frac{dy}{dx} + 13y = 0$$

$$y' = -\sin x e^{3x} + 3e^{3x} \cos x$$

$$y'' = -\cos x e^{3x} - 3\sin x e^{3x} - 2\sin x e^{3x} + 9 \cos x e^{3x}$$

Now, Mult⁶ with $\cancel{13} \frac{dy}{dx}$,

$$13y = 13e^{3x} \cos x$$

So by adding,

y'' , $-6y'$, $13y$ and the result will be zero.

$$\frac{dy}{dx^2} - 6 \frac{dy}{dx} + 13y = 0$$