

Question

Write down the differential operator \mathcal{L} which enables the following equation to be expressed as $\mathcal{L}[x(t)] = 0$: $\sin t \frac{d^2 x}{dx^2} + 3t \frac{dx}{dt} + \cos t x = 0$

Answer

$$\mathcal{L} = \sin t \frac{d^2}{dx^2} + 3t \frac{d}{dt} + \cos t$$