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25/EN07/027

EN07 381

$$y'' + 4y' + 5y = 6 \sin \theta$$

$$m^2 + 4m + 5 = 0$$

$$b = 4 \quad a = 1 \quad c = 5$$

$$\frac{-4 \pm \sqrt{16 - 4ac}}{2a}$$

$$\frac{-4 \pm \sqrt{16 - 4 \times 5}}{2}$$

$$\frac{-4 \pm \sqrt{-4}}{2}$$

$$-2 \pm j$$

$$y = e^{-2\theta} (A \cos \theta + B \sin \theta)$$

$$y = C \cos \theta + D \sin \theta$$

$$y'/dx = -C \sin \theta + D \cos \theta$$

$$y''/dx^2 = -C \cos \theta - D \sin \theta$$

$$-C \cos \theta - D \sin \theta + 4(-C \sin \theta + D \cos \theta) + 5(C \cos \theta + D \sin \theta) = 6 \sin \theta$$

$$-C \cos \theta - D \sin \theta - 4C \sin \theta + 4D \cos \theta + 5C \cos \theta + 5D \sin \theta = 6 \sin \theta$$

$$4C \cos \theta + 4D \sin \theta = 6 \sin \theta \rightarrow 0$$

$$-4C \sin \theta + 4D \cos \theta = 6 \sin \theta \rightarrow 0$$

$$D = 6$$

$$D = 3/4$$

$$C = -3/4$$

$$y = e^{-2\theta} (A \cos \theta + B \sin \theta) + 3/4 \cos \theta + 3/4 \sin \theta$$

$$2) EI \frac{d^2y}{dx^2} = W/2 (L-x)^2$$

$$EI m^2 = 0$$

$$(L-x)^2$$

$$m^2 = 0$$

$$m = \pm 0$$

$$y = e^{0 \cdot x} [A + Bx] \quad y = A + Bx$$

$$y = (L-x)^2$$

$$(L-x)(L-x)$$

$$(L^2 - 2Lx + x^2)$$

$$y = (Cx^2 + Dx^3 + Ex^4)$$

$$dy/dx = 2Cx + 3Dx^2 + 4Ex^3$$

$$d^2y/dx^2 = 2C + 6Dx + 12Ex^2$$

$$EI(2C + 6Dx + 12Ex^2) = 10/2 [l^2 - 2lx + x^2]$$

$$2(2CEI + 6DxEI + 12Ex^2EI) = Cl^2 - 2Clx + lx^2$$

$$4CEI + 12DxEI + 24Ex^2EI = Cl^2 - 2Clx + lx^2$$

$$24EI = Cl$$

$$E = \frac{Cl}{24EI}$$

$$24EI$$

$$12DEI = -2Cl$$

$$D = \frac{-2Cl}{12EI}$$

$$12EI$$

$$4CEI = Cl^2$$

$$C = \frac{Cl^2}{4EI}$$

$$4EI$$

$$y = \left[\frac{Cl^2}{4EI} \right] x^2 - \left[\frac{Cl}{6EI} \right] x^3 + \left[\frac{Cl}{24EI} \right] x^4$$

$$= \frac{Cl^2x^2}{4EI} - \frac{Clx^3}{6EI} + \frac{Clx^4}{24EI}$$

$$= \frac{6Cl^2x^2 - 4Clx^3 + Clx^4}{24EI}$$

$$y = A + Bx + \frac{Cl}{24EI} [6l^2x^2 + 4lx^3 + x^4]$$

$$x=0 \quad dy/dx = 0 \quad \text{at } y=0$$

$$0 = A + B(0) + \frac{Cl}{24EI} [6l^2(0) - 4l(0) + 0]$$

$$A = 0$$

$$dy/dx = B + \frac{10}{24EI} [12l^2x + 12lx^2 + 4x^3]$$

$$x=0$$

$$0 = B$$

$$y = \frac{w x}{24EI} [6l^2 - 9lx + 3x^2]$$

y when $x = l$

$$y = \frac{wl^2}{24EI} [l^2 - 9l^2 + 3l^2]$$

$$= \frac{wl^2}{24EI} \times 3l^2$$

$$= \frac{wl^4}{8EI}$$