$$y = \frac{w}{24EL}\left[6L^4 - 4L^4 + L^4\right]$$

$$y = \frac{w}{24EL}\,3L^4$$

$$y = \frac{3wL^4}{24EL} = \frac{wL^4}{8EL}$$

$$\frac{FL^3}{12E} = \frac{w}{2}$$

$$F = \frac{w}{24EL}$$

$$P.I = y = \left[\left(\frac{wL^2}{4EL}\right)x^2 + \left[\frac{-wL}{6EL}\right]x^3 + x^4\right]\left[\frac{w}{24EL}\right]$$

$$y = \frac{wL^2x^2 \cdot 6 - 4wLx^3 + wx^4}{24EL}$$

$$y = G.S = A + Bx + \frac{w}{24EL}(6L^2x^2 - 4Lx^3 + x^4)$$

When $y = 0$ and $x = 0$

$$0 = A + B(0) + \frac{w}{24EL}(0)$$

$$\therefore A = 0$$

$$\frac{dy}{dx} = B + \frac{w}{24EL}(12L^2x - 12Lx^2 + 4x^3)$$ when $\frac{dy}{dx} = 0$ $x = 0$

$$0 = B + \frac{w}{24EL}(0)$$

$$\therefore B = 0$$

$$G.S = y = 0 + 0 + \frac{w}{24EL}(6L^2x^2 - 4Lx^3 + x^4)$$

$$y = \frac{w}{24EL}(6L^2x^2 - 4Lx^3 + x^4)$$

When $x = L$

$$y = \frac{w}{24EL}[6L^2(L)^2 - 4L(L)^3 + (L)^4]$$

(2)

$$EI\frac{d^2y}{dx^2} = \frac{w}{2}(L-x)^2 \quad \text{---} \quad (1)$$

$$EIm^2 = 0$$

$$m^2 = 0$$

$$m = 0 \text{ (twice)}$$

$$\therefore y = e^{0x}(A + Bx)$$

$$y = A + Bx$$

$$P.I = y = Cx^2 + Dx^3 + Ex^4$$

$$\frac{dy}{dx} = 2Cx + 3Dx^2 + 4Ex^3$$

$$\frac{d^2y}{dx^2} = 2C + 6Dx + 12Ex^2$$

Sub in equ (1)

$$EI(2C + 6Dx + 12Ex^2) = \frac{w}{2}(L-x)^2$$

$$EI(2C + 6Dx + 12Ex^2) = \frac{w}{2}(L^2 - 2Lx + x^2)$$

equating both sides

$$EI2C = \frac{wL^2}{2} \qquad C = \frac{wL^2}{2} \div EI2$$

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

$$EI6D = -2L \times w$$

$$2$$

$$D = \frac{-2L \times w}{} = -wL$$

$6 = 4D - 4C$ —— ①

$0 = -C + 4D + 5C$

$0 = 4C + 4D$ —— ②

$C = -D$

Sub in ①

$6 = 4D - 4(-D)$

$6 = 4D + 4D$

$8D = 6 \quad D = 6/8 = 3/4$

$C = -(3/4)$

Sub in P.I

$P.I = \frac{-3}{4}\cos\theta + \left(\frac{3}{4}\right)\sin\theta$

$G.S = Ae^{x} + Be^{-5x} + \left[\frac{-3}{4}(\cos\theta + \frac{3}{4}\sin\theta)\right.$

$\frac{dy}{dx} = Ae^{x} - 5Be^{-5x} + \left[\frac{3}{4}\sin\theta + \frac{3}{4}\cos\theta\right)$

(ii)

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15/ENG04/1047
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(1)

@ The $\frac{d^2y}{d\theta^2} + 4\frac{dy}{d\theta} + 5y = 6\sin\theta$

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

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

$m(m+5) - 1(m+5)$

$(m-1)(m+5) = 0$

$m_1 = 1 \quad m_2 = -5$

$y = Ae^{x} + Be^{-5x}$

P.I $= y = C\cos\theta + D\sin\theta$

$\frac{dy}{dx} = -C\sin\theta + D\cos\theta$

$\frac{d^2y}{dx^2} = -C\cos\theta - D\sin\theta$

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

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

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

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

$6 = -D - 4C + 5D$

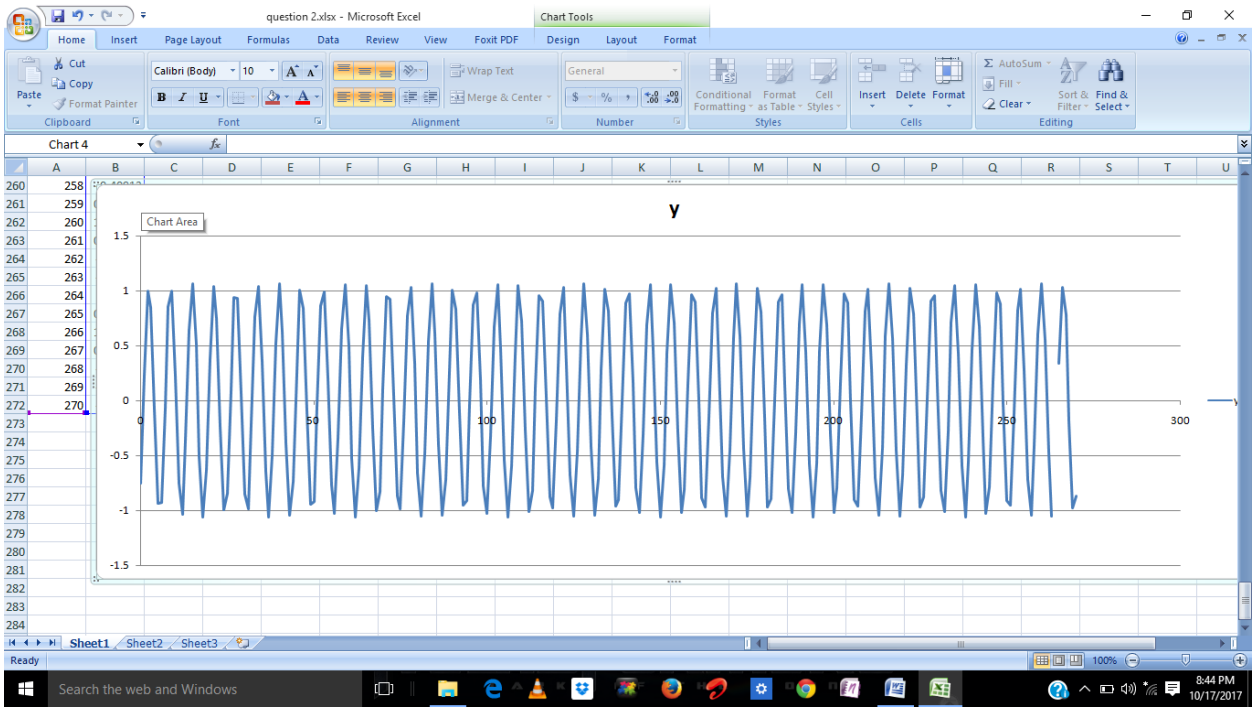
question 2.xlsx - Microsoft Excel
Chart Tools
Chart 4
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Chart Area
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50
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250
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Sheet1
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Sheet3
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