

(ع)

$$k_1 = 0.037047$$

$$k_2 = 0.03611$$

$$k_3 = 0.0361$$

$$k_4 = 0.03523$$

$$X = 0.2953$$

~~~~~

$$h_1 = 0.0352$$

$$h_2 = 0.0343$$

$$h_3 = 0.03437$$

$$h_4 = 0.03351$$

$$X = 0.3226$$

(ش)

$$k_1 = 0.033516$$

$$k_2 = 0.032678$$

$$k_3 = 0.032699$$

$$k_4 = 0.0318$$

$$X = 0.362371$$

$$~~~~~$$

$$h_1 = 0.03188$$

$$h_2 = 0.03108$$

$$h_3 = 0.0311$$

$$h_4 = 0.03032$$

$$X = 0.3934$$

Q5

$$y(0.5) = 0.1254$$

$$y(1) = 0.452$$

$$y(1.5) = 0.137$$

$$y(2) = 0.0002$$

Q6

$$y(0.1) = 1.005;$$

Q7

$$y = 1.019$$

Q8

$$y_n = y_m + 0.1 * (2(x_m + 1) \cos 2y_m)$$

$$\rightarrow 0.2$$

Q9

$$y_1 = 0.5 + 0.1(0.5) \sin\left(\frac{\pi}{2}\right) = 0.55$$

Q10

$$\left\{ \begin{array}{l} k_1 = 0.5 \end{array} \right.$$

$$\left\{ \begin{array}{l} k_2 = 0.475 \end{array} \right.$$

$$\left\{ \begin{array}{l} y_1 = 0.04875 \end{array} \right.$$

$$\left\{ \begin{array}{l} k_1 = 0.04756 \end{array} \right.$$

$$\left\{ \begin{array}{l} k_2 = 0.04518 \end{array} \right.$$

$$\left\{ \begin{array}{l} y_2 = 0.09512 \end{array} \right.$$

Q11

(الف)

$$h_1 = 0.0505 \quad h_2 = 0.0487$$
$$h_3 = 0.048781 \quad h_4 = 0.047561$$
$$y_1 = 0.04877$$

$$h_1 = 0.047561 \quad h_2 = 0.046372$$
$$h_3 = 0.04640 \quad h_4 = 0.04524$$
$$x = 0.9516$$

(ب)

$$h_1 = 0.045242 \quad h_2 = 0.044$$
$$h_3 = 0.0441 \quad h_4 = 0.0430$$
$$x = 0.1392$$

$$h_1 = 0.0430 \quad h_2 = 0.0419 \quad h_3 = 0.0419$$
$$h_4 = 0.0409$$
$$x = 0.181269$$

(ج)

$$h_1 = 0.0409 \quad h_2 = 0.03995 \quad h_3 = 0.0399$$
$$h_4 = 0.0389 \quad x = 0.221199$$
$$h_1 = 0.0389 \quad h_2 = 0.03796 \quad h_3 = 0.03799$$
$$h_4 = 0.03704$$
$$x = 0.2591$$



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4th Dec

<Header>

Subject: NA Chapter 5th

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Q1

$$Y_n = Y_m + 0.1 * \left( \frac{Y_n - Y_m}{X_n} \right) + \frac{(0.1)^2}{2} * \left( \frac{2X_m X_n}{X_n^2} \right) + \frac{(0.1)^3}{6} * \left( \frac{3X_m - 6Y_n}{X_m^3} \right) + \frac{(0.1)^4}{24} * \left( \frac{-12X_m + 24Y_n}{X_m^4} \right)$$

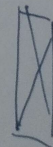
→ 2.0023

Q2

$$Y_{mn} = Y_n * \sum_{i=0}^{i=4} \frac{h^{i-1}}{i!} * f(i) * (X_m, Y_m) = \sim$$

$Y(0.5) = 1.7974$

Q3



1.020

$$Y_1 = 1.01, Y_2 = 1.02, Y_3 = 1.030;$$

$Y_4 = 1.0406$

Q4

$$Y_1 = 1.210$$

$$Y_2 = 1.875$$

$$Y_3 = 1.875$$

$$Y_4 = 2.2844$$