

Assignment of unit 4 by Siddharth Shandar Bhatt

Q1 Solve  $\frac{dy}{dx} = x+y$ ,  $y(0) = 0$ , numerically

upto  $x = 1.2$  with  $h = 0.1$ . using Taylor's series method.

Q2 Evaluate  $y(0.1)$  correct to four places of decimal by using Taylor's series method if  $y(x)$  satisfies

$$y' = xy + 1, \quad y(0) = 1$$

Q3 Solve  $\frac{dy}{dx} = 1-y$ ,  $y(0) = 0$  by Euler's

method and obtain  $y$  at  $x = 0.1, 0.2, 0.3$

Q4: Given  $\frac{dy}{dx} = x^3 + y$ ,  $y(0) = 1$ , compute

$y(0.2)$  by Euler's method taking  $h = 0.01$

Q5: Using Milne's method find  $y(4.5)$  given

$$5xy' + y^2 - 2 = 0 \quad \text{given } y(4) = 1, \quad y(4.1) = 1.0049$$

$$y(4.2) = 1.0097, \quad y(4.3) = 1.0143,$$

$$y(4.4) = 1.0187$$

Q6 Given  $2\frac{dy}{dx} = (1+x^2)y^2$  and  $y(0) = 1$ ,

$$y(0.1) = 1.06, \quad y(0.2) = 1.12, \quad y(0.3) = 1.21$$

evaluate  $y(0.4)$  by Milne's predictor corrector method

