**Solution of Ordinary Differential Equation**

* Use the Taylor series method to solve the following differential equation : , y(0) = 1 for x = 0.25

Solution:

Taylor’s series method,

Given,

From (1) =>

* Use the Picard’s method to solve the following differential equation : , y(0) = 1 for x = 0.25

Solution:

Given,

By using Picard’s method,

If we stop here then we get,

* Use the Euler’s method to solve the following differential equation : , y(1) = 2 for x = 2 using h=0.25

Solution:

Given,

**Using Euler’s method**

* Use the Heun’s method to solve the following differential equation : , y(0) = 2 for x = 1 using h=0.25

Solution:

Given,

**Using Heun’s method**

Iteration 1:

Iteration 2:

Iteration 3:

Iteration 4:

* Use the Runge-Kutta (RK) method to solve the following differential equation : , y(0) = 1 for x = 0.5 using h=0.25

Solution:

**Given,**

,

**Runge-Kutta method :**

**Using Runge-Kutta method**

Iteration 1:

Iteration 2: