Hybrid 4

Solving Ordinary Differential equations using Euler's Method

Answers included

Use Euler's method to find y-values of the solution for the given values of x and Δx, if the curve of the solution passes through the given point.

1. $\frac{dy}{dx} = x + 1;$ $x = 0$ to $x = 1$; $\Delta x = 0.2$; (0, 1)

Answer:

x	0.0	0.2	0.4	0.6	0.8	1.0
y	1.00	1.20	1.44	1.72	2.04	2.40

2. $\frac{dy}{dx} = y(0.4x + 1);$ $x = -0.2$ to $x = 0.3$; $\Delta x = 0.1$; (−0.2, 2)

Answer:

x	−0.2	−0.1	0.0	0.1	0.2	0.3
y	2.0000	2.1840	2.3937	2.6330	2.9069	3.2208

3. The differential equation of Exercise 1 with $\Delta x = 0.1$

Answer:

x	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7
y	1.00	1.10	1.21	1.33	1.46	1.60	1.75	1.91

x	0.8	0.9	1.0
y	2.08	2.26	2.45