A3Q2

Let $h_0 = h_1 = 0.1$

Using Euler's Method:

$$x_{k+1} = x_k + h_k f(t_k, x_k, y_k,)$$

$$x_1 = 2 + 0.1f(1{,}2, -3)$$

$$x_1 = 2 + 0.1((2)(-3) - (1) + 2)$$

$$x_1 = 1.5$$

$$y_{k+1} = y_k + h_k f(t_k, x_k, y_k,)$$

$$y_1 = -3 + 0.1f(1{,}2, -3)$$

$$y_1 = -3 + 0.1\left(\frac{3(2)}{(-3)} + 5(1)(2)\right)$$

$$y_1 = -2.2$$

$$x_2 = 1.5 + 0.1f(1.1{,}1.5, -2.2)$$

$$x_2 = 1.5 + 0.1((1.5)(-2.2) - (1.1) + 2)$$

$$x_2 = 1.26$$

$$y_2 = -2.2 + 0.1f(1.1{,}1.5, -2.2)$$

$$y_2 = -2.2 + 0.1\left(\frac{3(1.5)}{(-2.2)} + 5(1.1)(1.5)\right)$$

$$y_2 = -1.5795$$

k	h	t	x	y	dx/dt	dy/dt
0	0.1	1	2	-3	-5	8
1	0.1	1.1	1.5	-2.2	-2.4	6.2045
2			1.26	-1.5795		