Math330

Assignment #8

Summer course 2017/2018 Mahmoud Ghannam

**(Q1)** Given the IVP: $3y' + 5y^2 = \sin t$, with $y(0.2) = 2$.

(a) Approximate $y(0.5)$ using Euler's method and a step size $h = 0.3$

(b) Approximate $y(0.5)$ using Heun's method and a step size $h = 0.3$

(c) Approximate $y(0.5)$ using Taylor's method of order 2 and a step size $h = 0.3$

(d) Approximate $y(0.5)$ using RK4 and a step size $h = 0.3$

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**(Q2)** Given the IVP: $\dfrac{dy}{dx} = \dfrac{x - 5y^2}{2}$; $y(0.3) = 2$.

(a) Estimate $y(0.4)$ using Euler's method and a step size $h = 0.1$

(b) Estimate $y(0.4)$ using Heun's method and a step size $h = 0.1$

(c) Estimate $y(0.4)$ using Taylor's method of order 2 and a step size $h = 0.1$

(d) Estimate $y(0.4)$ using RK4 and a step size $h = 0.1$

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**(Q3)** Given the IVP: $y' = y(1 + e^{2t})$; $y(0) = 1$. Approximate $y(1)$ with $h = 0.5$ using:

(a) Euler's method. (b) Heun's method.

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