

Euler's method

Problems

1. Use Euler's method with step size 0.5 to compute the approximate y -values y_1, y_2, y_3, y_4 of the solution of the initial-value problem $y' = y - 2x, y(1) = 0$.
2. Use Euler's method with step size 0.2 to estimate $y(1)$, where $y(x)$ is the solution of the initial-value problem $y' = xy - x^2, y(0) = 1$.
3. Use Euler's method with step size 0.1 to estimate $y(0.5)$, where $y(x)$ is the solution of the initial-value problem $y' = y + xy, y(0) = 1$.
4. (a) Use Euler's method with step size 0.2 to estimate $y(0.4)$, where $y(x)$ is the solution of the initial-value problem $y' = x + y^2, y(0) = 0$.
 (b) Repeat part (a) with step size 0.1.

Use the following simulation to help you visualise and check your answers. Click on the link bellow to access:

https://teaching.smp.uq.edu.au/scims/Appl_analysis/Slope_fields.html

