

18.03SC Practice Problems 3

Euler's method

[Euler's method]

1. Use Euler's method to estimate the value at $x = 1.5$ of the solution of $\frac{dy}{dx} = F(x, y) = y^2 - x^2$ for which $y(0) = -1$. Use step size $h = 0.5$. Recall the notation $x_0 = 0, y_0 = -1, x_{n+1} = x_n + h, y_{n+1} = y_n + m_n h, m_n = F(x_n, y_n)$. Make a table with columns $n, x_n, y_n, m_n, m_n h$. Draw the Euler polygon.
2. Is the estimate found in Question 1 likely to be too large or too small?

MIT OpenCourseWare
<http://ocw.mit.edu>

18.03SC Differential Equations
Fall 2011

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.