Introduction to Scientific Computing

Exercise 1: Ordinary Differential Equations
(recapitulation)

Consider the ordinary differential equation

\[ y' - 2 \cdot x \cdot y = x \]

Sketch the direction field of the solutions of this differential equation!

Show that

\[ y(x) = -\frac{1}{2} + c \cdot e^{x^2} \]

is a solution of this differential equation for some constant c!

Find the unique solution whose graph passes through (1, 1)!