Exercise 1  Consider the differential equation

\[ m\frac{d^2y}{dx^2} + \frac{dy}{dx} - y = x \]

Discuss according to the value of the parameter \( m \) the order of the differential equation.

Exercise 2  Consider the differential equation

\[ \frac{d^2y}{dx^2} + |y| = 0 \]

Classify the differential equation according to type, order and whether it is linear or nonlinear.

Exercise 3  Find all the regions over which the differential equation

\[ x \frac{dy}{dx} = (y - 1)(2 - y) \]

has a unique solution. Draw the region(s).