Problem 1. Solve the initial value problem:
\[
\frac{dP}{dt} = 0.2P, \quad P(1) = 10
\]  

Problem 2. Solve the initial value problem:
\[
\frac{dy}{dx} = \frac{y}{x}, \quad y(1) = 1
\]  

Problem 3. Sketch a phase portrait (direction field) and a few qualitative solutions, including the one through (0,0), for the ODE
\[
\frac{dy}{dx} = y - x^2
\]  

Problem 4. Find the general solution to the ODE in Problem 3.

Problem 5. Use Euler’s method to take 2 steps approximating a solution to the ODE in Problem 3, with initial value \(y(0)=0\). Use \(\Delta x = 1\).