Homework 7

1. Solve the differential equation $y' = 3x^2 e^y$.

2. Solve the initial-value problem $y' = e^{x+y}$, $y(0) = 1$.

3. Solve the initial-value problem $xy' - y = x \ln x$, $y(1) = 2$.

4. Solve the initial-value problem $y' + 2xy = y$, $y(0) = 5$.

5. (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

$$y' = 2xy^2, \quad y(0) = 1$$

(b) Repeat part (a) with step size 0.1.
(c) Find the exact solution of the differential equation and compare the value at 0.4 with the approximations in parts (a) and (b).