Questions:

1. Use modified Euler's method with the specified step size to determine the solution to the given IVP at the specified point.
   (1) \( y' = 4y - 1 \); \( y(0) = 1 \); \( y(0.5) \) with \( h = 0.1 \)
   (2) \( y' = x - y^2 \); \( y(0) = 2 \); \( y(0.5) \) with \( h = 0.1 \)

2. Apply RK4 with \( h = 0.1 \) to determine an approximation to the solution to the IVP
   (3) \( y' = y - x \); \( y(0) = 0.5 \); \( y(0.5) \)
   (4) \( y' = 2xy^2 \); \( y(0) = 0.5 \); \( y(0.5) \)

3. Approximate \( y(0.2) \) when \( y(t) \) is the solution of the IVP
   \[ y'' + 2y' + 4y = 0 \]; \( y(0) = 2 \); \( \frac{dy(0)}{dt} = 0 \)
   using,
   (a) Euler's method  (b) RK4 method

   with \( h = 0.1 \) for both methods. Find the exact solution of the problem and compare the actual value of \( y(0.2) \) with \( y_2 \).