Exercise 11

Estimate the value of y at x = 0.5 if we have the initial value y = 1 at x = 0

$dy/dx = -2x^3 + 12x^2 - 20x + 8.5$

Use python script to calculate the result using different number of steps (n = 1, 2, 4, 8, 16, 32) with the following methods:

a. Euler
b. Runge-Kutta 2nd order method: Heun
c. Runge-Kutta 2nd order method: Ralston
d. Runge-Kutta 4th order method

Show the absolute error from each method if the exact solution is 3.751521.