

(1) Compute the value of $y(1)$ if $y' = 2xy^2$ and $y(0) = 2$.

- (2) Approximate $y(1)$ from the previous problem using Euler's method with 2 steps. Compare that approximation to that given by the improved Euler method with 1 steps, and the Runge-Kutta method using 1 step. Which is the best approximation?

(3) Solve the initial value problem $\frac{dy}{dx} = 3\frac{y}{x} - 3x^5$, $y(2) = 56$.