Math 3280 Worksheet 24: review. This worksheet will not be graded.

(1) Compute the value of $y(1)$ if $\dfrac{dy}{dx} = 2xy^2$ and $y(0) = 2$.

(2) Approximate $y(1)$ from the initial value problem above by using:
  (a) 1 step of Euler's method
  (b) 1 step of the Improved Euler Method
  (c) 2 steps of the Improved Euler Method
    Do these seem to be converging to the correct answer?

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

(4) Sherlock Holmes is awoken by a phone call from a policeman at 3:30am. A body has been discovered and foul play is suspected. Sherlock tells the police to determine the temperature of the body and, when he arrives at the scene 45 minutes later, he takes the temperature again. The two readings that cold 60 degree F morning were 80 degrees F and 70 degrees F. When was the latest time that the body was 98.6? (Note that in this problem, the readings are taken far enough apart that you should not use a slope estimate to determine the parameter in the ODE.)