Math 3280 Worksheet 5

Group members (2 to 4): _____

(1) Use Euler's method to estimate $y(1)$ if $y(0) = 1$ and $\frac{dy}{dx} = \frac{y}{2-x} + x^2$, using 1 step.

(2) Again, use Euler's method to estimate $y(1)$ if $y(0) = 1$ and $\frac{dy}{dx} = \frac{y}{2-x} + x^2$, but using 2 steps.

(3) Now use 4 steps for the same problem as before.

(4) Find the exact value of $y(1)$ by solving the initial value problem (note that the ODE is linear).

(5) Use two steps of the improved Euler method to approximate the same problem as before. Is this more accurate than using 4 steps of Euler's method?