

Instructions: Complete each of the following on separate, stapled sheets of paper.

1. Use Euler's Method to approximate the indicated value within four decimal places (do so by hand); use step sizes $h = .1$ first and then $h = .05$.
 - (a) $y' = 2x - 3y + 1$, $y(1) = 5$; $y(1.2)$
 - (b) $y' = xy$, $y(1) = 1$; $y(1.5)$
2. Use the Improved Euler's Method to approximate the indicated value within four decimal places (do so by hand); use step sizes $h = .1$ first and then $h = .05$.
 - (a) $y' = 2x - 3y + 1$, $y(1) = 5$; $y(1.2)$
 - (b) $y' = xy$, $y(1) = 1$; $y(1.5)$
3. Use the Order Four Runge-Kutta Method to approximate the indicated value within four decimal places (do so by hand); use step sizes $h = .1$ first and then $h = .05$.
 - (a) $y' = 2x - 3y + 1$, $y(1) = 5$; $y(1.2)$
 - (b) $y' = xy$, $y(1) = 1$; $y(1.5)$
4. Compare the approximations you've obtained above. Which converges most quickly?