

Second Exam
Wednesday, October 4

This exam is closed book. Make sure your name is on all pages. Show all work, and show it in a logical and organized manner. Each entire problem is worth 20 points. You may keep this exam sheet.

1. Consider $y' = -y^2$, $y(0)=1$;
 - (a) Do two steps of Euler's method with step size $h = 0.1$
 - (b) Do four steps of Euler's method with step size $h = 0.05$
 - (c) Compare the results above with the exact solution $y(0.2)$.
2. Find the general solution to $y'' - y' - 2y = 0$.
3. Find the solution to the initial value problem $y'' + y' + y = 0$, $y(0) = 0$, $y'(0) = 1$.
4. Find the solution to the initial value problem $y'' + 6y' + 9y = 0$, $y(0) = 0$, $y'(0) = 1$.
5. Find the solution to the initial value problem $y'' + y = \sin(2t)$, $y(0) = 0$, $y'(0) = 0$.