

HOMEWORK 10

MATH H54

Office Hours: Tuesday 2:30-4pm and Wednesday 5:15-6:45pm at 735 Evans.

Kubrat's Office Hours: Friday 9-11am at 741 Evans.

Submit your homework at the beginning of the discussion section on Wednesday. *Late homework will not be accepted under any circumstances.*

You are encouraged to discuss the problems with your classmates, but you must write your solutions on your own and acknowledge collaborators/cite references if any.

Write clearly! Mastering mathematical writing is one of the goals of this course.

You have to staple your work if it is more than one page.

The following exercises are from the corresponding sections of the **Differential Equations part** of UC Berkeley custom edition of Lay, Nagle, Saff, Snider, *Linear Algebra and Differential Equations*.

Due November 20:

- **Exercise 4.2:** 7, 11, 16, 26, 46
- **Exercise 4.3:** 10, 21, 28, 38
- **Exercise 4.4:** 11, 20, 22, 26
- **Exercise 4.5:** 17, 20, 28, 48
- **Exercise 4.6:** 1, 3, 5, 20
- **Additional Problem:** If the roots of the auxiliary equation are real, show that a non-zero solution to $y'' + by' + c = 0$ can take the value 0 at most once, i.e. if $y(t)$ is a non-zero solution, then there is at most one point $t_0 \in (-\infty, \infty)$ such that $y(t_0) = 0$.