MATH 285 E1/F1 GRADED HOMEWORK SET 1
DUE WEDNESDAY SEPTEMBER 10 IN LECTURE

IT WOULD BE SO SWEET if you followed these instructions: Please put each problem on a **separate sheet** of paper with your **name and section (E1 or F1)**. If a problem runs multiple pages, please staple all the pages for a single problem together. Think of each problem as a separate assignment. This may be annoying, but it will greatly streamline the grading process, resulting in faster feedback for you. **Thank you!**

Section and problem numbers refer to *Differential Equations & Boundary Value Problems*, Fourth Edition, by Edwards and Penney.

(1) Let $f(x)$ be the function defined piece-wise as

$$f(x) = \begin{cases} x & \text{if } x \le 5 \\ 5 & \text{if } x > 5 \end{cases}$$

Find the solution of the initial value problem

$$\frac{dy}{dx} = f(x), \quad y(0) = 100.$$

Hint: Your solution will also be defined piece-wise.

(2) Consider the differential equation

$$\frac{dy}{dx} = -\frac{x}{y}.$$

Sketch the slope field for this equation. What are the solution curves? *Hint*: You should recognize them as semi-familiar geometric shapes.

(3) Section 1.4, problem 22.

(4) Section 1.5, problem 10 (Find the general solution valid for $x > 0$).

(5) Section 1.6, problem 14.