

## Math 241 F1H: Problem Set 7

**Due date:** In class on **Thursday**, March 13. Note nonstandard due date.

**Office hours:** For this week only, my office hours are Monday 3 - 4:30 and Wednesday from 4-5:30.

1. Section 5.4: #16.
2. Chapter 5 review exercise #5.
3. Chapter 5 review exercise #7.
4. Chapter 5 review exercise #14.
5. For the region  $U = \{1 < \|\mathbf{x}\| < 2\}$  in  $\mathbb{R}^2$ , consider the vector field

$$\mathbf{F}(x, y) = \frac{1}{x^2 + y^2}(-y, x)$$

- (a) Sketch  $U$  and the vector field  $\mathbf{F}$ .
  - (b) Check that the scalar curl of  $\mathbf{F}$  vanishes.
  - (c) Despite this, demonstrate that  $\mathbf{F}$  is not conservative by showing it is not path-independent.
6. Section 6.1 #1.
  7. Section 6.2 #19.
  8. Section 6.2 #27.
  9. Section 6.3 #3.

**Note:** This assignment is complete.