
Homework 4
Due: Wednesday, February 15

1. [F]5.7.1.

2. [F]5.7.2.

3. Let $R \subset \mathbb{R}^2$ be the region

$$R = \{(x, y) : \frac{1}{2} < x^2 + y^2 < 2\}.$$

Consider the vector field

$$\vec{F} = \left(\frac{-y}{x^2 + y^2}, \frac{x}{x^2 + y^2} \right).$$

Show that:

(a) $\frac{\partial}{\partial x} F_2 = \frac{\partial}{\partial y} F_1$ on R , but

(b) \vec{F} is not integrable.

4. (a) [F] 5.8.4a. (HINT: *Green's theorem.*)

(b) [F] 5.8.4b. (HINT: *Such a curve is contained in a circle.*)