

Exercises

We will cover Chapter 12.4 before Chapter 12.2.

Chapter 12.1 # 1, 2, 3, 5, 7, 9, 11

Chapter 12.2 # 1, 4, 9, 12abc

Chapter 12.4 # 1, 2, 3, 5, 15, 21*

Another hint for #21: You'll need to use the chain rule for a curve \mathbf{R} and scalar field φ ,

$$\frac{d}{dt}\varphi(\mathbf{R}) = \nabla\varphi \cdot \mathbf{R}'$$

Problem A: Let C be the square with vertices $(-1, 0)$, $(0, 0)$, $(0, 1)$, and $(-1, 1)$. Let $\mathbf{F} = y \cos(x)\mathbf{i} - y^3\mathbf{j}$. Compute

$$\oint_C \mathbf{F} \cdot d\mathbf{R}$$

in two ways: once using a double integral, and once by summing four line integrals, one for each edge of the square.