MATH 223 Spring 2025
Assignment 23
Due: Friday, April 18

Reading

Read carefully Section 6.4 "Jacobians and the Change of Variable" in our text *Multivariable Calculus: A Linear Algebra Based Approach.*

Writing

Write out careful and complete solutions of Exercises A, B, C and D below.

A. Give a careful argument that the limit of a function whose values are all non-negative can not be negative.

B. Verify that Leibniz's Rule is correct for each of the following:

1. $\int_3^9 x^2 + y^2 \, dy$
2. $\int_2^5 x + \ y^{-3} \, dy$
3. $\int_1^e xy + \ln y - \arctan y \, dy$

C. Use Leibniz's Rule to determine $F'(x)$ if $F(x) = \int_0^{12} \frac{\sin xy}{y} \, dy$.

D. Use Leibniz's Rule to determine $G'(y)$ if $G(y) = \int_{-5}^{5} \frac{1-e^{-xy}}{x} dx$.