

MATH 223 Fall 2023
Assignment 23
Due: Wednesday, November 8

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 $G(y) = \int_{-5}^5 \frac{1-e^{-xy}}{x} dx$.

