

Math 32B-2: Calculus of Several Variables – Homework #8

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Due: May 24, 2019

Exercise 1.

Compute the integrals $\int \int_{S_i} f_i(x, y, z) \, dS$ where $S_i = G(D_i)$ are the surfaces given by the parametrizations from previous exercise, point (i) , $i \in \{1, \dots, 4\}$ and the functions and D_i are the followings:

- (1) $f_1(x, y, z) = y$ and $D_1 = [1, 2] \times [0, 1]$, where $G(u, v) = (u^2 - v^2, u + v, u - v)$.
- (2) $f_2(x, y, z) = x^2 + y^2 + z^2$ and $D_2 = [1, 2] \times [0, \pi/2]$, where $G(r, \theta) = (r \cos \theta, r \sin \theta, 1 - r^2)$.
- (3) $f_3(x, y, z) = (x^2 - y^2)z$ and $D_3 = [0, 2] \times [0, \pi/4]$, where $G(u, v) = (u \cos v, u \sin v, u)$.
- (4) $f_4(x, y, z) = y$ and $D_4 = [1, 2] \times [1, 2]$, where $G(u, v) = (u, v^3, u + v)$.

Hint: notice that these parametrizations were used in Hw #7/Exercise 4.

Exercise 2 (From Rogawski-Adams).

Exercises 2, 4, 6, 8 (not the Preliminary questions!) on page 968 from Rogawski-Adams.

Exercise 3 (From Rogawski-Adams).

Exercises 18, 20, 26 and 28 on page 968-969 from Rogawski-Adams.

Exercise 4.

Exercises 2, 4, 6, 8, 10 (not the Preliminary questions!) on page 983 from Rogawski-Adams.