Reading:

- Sections 2.1, 2.2, 2.3, and 2.4.

Written Assignment:

A. Exercise 2.19 (p. 38).

B. Exercise 2.24 (p. 39).

C. Exercise 2.25 (p. 39).

D. Let $H \subset \mathbb{R}^2$ be the right half-plane, defined by

$$H = \{(u, v) : u > 0\}.$$

Suppose $C \subset H$ is a simple curve (see Example 2.18). The **surface of revolution determined by C** is the set $S_C \subset \mathbb{R}^3$ defined by

$$S_C = \{(x, y, z) : (s(x, y), z) \in C\},$$

where $s(x, y) = \sqrt{x^2 + y^2}$. The simple curve C is called the **generating curve** for the surface. Show that S_C is a regular surface.

E. Let $f : \mathbb{R}^3 \to \mathbb{R}$ be the function $f(x, y, z) = x^2 - 2xy + y^2$. Which level sets of f are regular surfaces? For each level set, either prove it is a regular surface or prove it is not.