

Analytic Geometry and Calculus III (22005 Section 002)
HW5, due Wednesday, October 5
Instructor: Prof. Artem Zvavitch

Problem 1. Find the direction in which the function

$$f(x, y) = x^4y - x^3y^2$$

decreases faster at the point $(2, -1)$.

Problem 2. Find equation of the tangent plane to the surface

$$5x^2 + 3y^2 + 8z^2 = 353$$

at point $(3, 6, 5)$.

Problem 3. Find, and characterize the critical points of the function

$$f(x, y) = 5 + 76xy + 38x^2 + 240y + \frac{y^4}{4}$$

Problem 4. Find the absolute minimum value of the function on the set D , where

$$f(x, y) = 6 + 3xy - 2x - 4y$$

and D is the region bounded by the parabola $y = x^2$ and the line $y = 4$.