

Mathematical analysis 2, WNE, 2018/2019
meeting 15.

11 April 2019

1. Find the maximal value of function:

a) $z(x, y) = 1 + \frac{4}{3}x^3 + 4y^3 - x^4 - y^4$,

b) $z(x, y) = (1 + x^2) \exp(-x^2 - y^2)$.

2. Find dimensions x, y, z of a rectangular box with volume $V = 1000$ and minimal possible surface area. Does it make sense to ask about the maximal possible surface area?
3. Find dimensions x, y, z of a rectangular box of maximal possible volume and surface area of 600cm^2 .
4. A rectangular box without a lid has volume of 4 litres. What dimensions x, y, z to minimize the surface area of the sides?
5. Rectangular box is to have volume of 48 litres. The cost of material is 1PLN per m^2 of a side wall, 2PLN per m^2 of a lid and 3PLN per m^2 of the base. Determine the minimal cost of such a box.