

FORK1005

Exercises for Lecture 6

August 17, 2015

2 Direct Substitution

Exercise 2.1. You have 600 kroner to buy apples and bananas. Apples cost 4 kr a piece and bananas cost 3 a piece. Denoting by x the number of apples you buy, and by y the number of bananas you buy, your utility function is $U(x, y) = xy$. You want to spend all your money and maximize your utility. Set up the constrained optimization problem, and solve it by direct substitution.

3 The Lagrange Multiplier Method

Exercise 3.1. Solve Exercise 2.1 using the Lagrange multiplier method.

Exercise 3.2. You have the Cobb-Douglas utility function $U(x, y) = x^{1/2}y^{1/2}$ and the budget constraint $3x + 2y = 300$. Find the values for x and y that maximizes U , subject to the budget constraint.

Exercise 3.3. Maximize the function $f(x, y) = x^2 + y^2 - 4x + 30$ subject to the constraint $x^2 + 2y^2 = 400$.

Exercise 3.4. Minimize the function $f(x, y) = x^2 + y^2$ subject to the constraint $4x + 3y = 20$.