Advanced Microeconomics - Problem set 3
Due date: classes on November 4th

Problem 1 (2pt) ***Exchange economy***. *Consider a pure exchange economy with* $u_1(x,y) = \ln(x) + y$, $u_2(x,y) = \ln(x) + 2y$, $\omega_1 = (1,0)$, $\omega_2 = (0,1)$. *Find the set of Pareto-optimal allocations and Walrasian equilibria and depict them on the Edgeworth box.*

Problem 2 (3pt) ***Production economy***. *Consider an economy with two consumption goods* x, y *and two production inputs: capital and labor* k, l. *Consumer supply capital and labor inelastically* $k = k_x + k_y = 324$, $l = l_x + l_y = 2500$. *There is no endowment in good* x, y. *Production function for* x *is given by* $f_x(k_x, l_x) = 48^{\frac{1}{4}} k_x^{\frac{3}{4}} l_x^{\frac{1}{4}}$, *while that of* y *by* $f_y(k_y, l_y) = 3^{\frac{1}{4}} k_y^{\frac{1}{4}} l_y^{\frac{3}{4}}$. *A single consumer has preferences:* $U(x,y) = x^{\frac{1}{2}} y^{\frac{1}{2}}$. *Assume* $p_x = 100$. *Compute the Walrasian equilibrum prices of capital, labor and good* y.

Problem 3 (3pt) ***Negishi***. *Consider an exchange economy:* $u_1(x_A, x_B) = 2\sqrt{x_A x_B}$, $u_2(x_A, x_B) = 2\ln(x_A) + \ln(x_B)$, $\omega_1 = (2,0)$, $\omega_2 = (0,5)$.

- *Compute the Walrasian equilibrium with* p_A *normalized to 1*
- *compute the Lagrange multipliers for both consuments' budgets constraints*
- *Solve the problem of maximization of the social welfare function for given weights* λ_i *and feasibility constraints.*
- *Compute the Lagrange multipliers associated with the constraints in the social welfare function maximization problem*
- *Determine* λ_i, *such that Walrasian equilibrium allocation solve the problem of maximization of the social welfare function.*

Problem 4 (2pt) *6.4.6 from our notes.*