AS/ECON 4080MW W2007–08 Assignment 1

due : Wed. January 23, before class

All 5 questions count equally.

1. What are all the efficient allocations in the following two–good, two–person economy?

Good X is a pure private good, and good Z is a pure public good. The economy's production possibility frontier has the equation :

$$X + 2Z = 15$$

where X and Z are the total quantities produced of the private good and of the public good, respectively.

Person 1's preferences can be represented by the utility function

$$U^1(x_1, z_1) = x_1 + 3 \ln z_1$$

and person 2's by the utility function

$$U^2(x_2, z_2) = x_2 z_2$$

where x_i is person i's consumption of the private good, and z_i is person i's consumption of the public good, and where "$\ln z_1$" is the natural logarithm of z_1.

2. What are all the efficient allocations in the following two–good, two–person economy?

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$$U^1(x_1, z_1) = x_1 + 3 \ln z_1$$

and person 2's by the utility function

$$u^2(x_2, z_2) = \ln x_2 + \ln z_2$$

where x_i is person i's consumption of the private good, and z_i is person i's consumption of the public good.

3. What would the Lindahl equilibrium be in the economy described in question #1 above, if person #1 had an income (measured in units of the private good) of 9, and person #2 had an income of 6?

4. What would the (Nash equilibrium) outcome be in the economy described in question #1 above, if person #1 had an income (measured in units of the private good) of 11, and person #2 had an income of 4, and if the public good were provided by voluntary donations from the two people, if the two people acted non–cooperatively?

5. What would the (Nash equilibrium) outcome be in the economy described in question #1 above, if person #1 had an income (measured in units of the private good) of 7, and person #2 had an income of 8, and if the public good were provided by voluntary donations from the two people, if the two people acted non–cooperatively?