

Final Exam
(100 points)

- (8 pts) 1. If someone remarks to you that the Pareto criterion is disappointing in that it is additive, meaning that it operates by adding the monetized welfare changes experienced by different agents, what would you say to correct this person, defend the Pareto criterion, and to direct their complaint in the proper direction?
- (14 pts) 2. What are the two rules which theoretically emerge about the general equilibrium interpretation of welfare results using statistically estimated supply and demand curves? Be clear. What's the distinction between partial equilibrium and general equilibrium?
- (14 pts) 3. Accurately illustrate the appropriate welfare graphics corresponding to a sales tax policy when the initial pre-tax scenario is one of perfect competition. Clearly illustrate and label all relevant impacts.
- (14 pts) 4. Fully discuss (by expanding upon it) this textbook quote and its primary themes:

"The Willig results are attractive for some purposes because the estimation of consumer surplus is easier than direct estimation of compensating and equivalent variations when demands are arbitrarily specified (as in the case where a quick welfare analysis may be required on the basis of available elasticity estimates). That is, estimation of consumer surplus requires simply calculating the area under an estimated ordinary demand curve, whereas estimation of compensating and equivalent variations can involve solution of a system of partial differential equations based on estimated demand functions."
- (18 pts) 5. There are multiple forms of externality policy that may be practical, depending on circumstances. Given the distinction between depletable and undepletable externalities (explain this distinction), discuss the implications for policies. Are there policy types which are potential remedies for one of these externality types but not the other? Why or why not?

The last question is on the back page.

6. The 100 people living on a intergalactic craft named V-Forge pass their time in the enjoyment of various forms of Art (all Art is rival and ceases to exist upon consumption). All of their other, material wants are provided by robots called Hueies. There are two types of people, who differ according to their preferences. Type 1 people are Art lovers with equivalent preferences. Type 2 people are also identical.

$$U_1 = A_1^k H_1 \quad U_2 = A_2^{1/k} H_2 \quad k \text{ (a single constant)} > 1,$$

where A_i denotes composite Art consumption by person i and H_i is the number of Hueies operating as the person's servants. There are 50 people of each type. Each and every person has one Huey; these can either be used as servants or they can be leased out. A Huey's time is divisible.

There is a single business on board the spaceship, and this business is the only source of Art. The business is run by a computer. The computer is capable of original thought, and it rents Hueies from people and assigns them original Art production tasks. The business's production function is $A = H^{1/2}$. Any profits are divided evenly among the 100 travelers.

- (12 pts) a. What is aggregate demand for Art onboard V-Forge? State it as precisely as possible.
- (14 pts) b. Completely determine and summarize the competitive equilibrium.
- (6 pts) c. What is the production possibility frontier for final goods, focusing on the total amount of Art and the number of servant Hueies? Does the competitive equilibrium lie on the frontier?