

Homework 9
Econ 361
Intermediate Microeconomic Analysis
30 points

1. (5 points) Two oligopolistic automobile companies face the following payoff matrix, which gives payoffs (in millions of dollars) from investing in a hydrogen fueled automobile:

		Company B	
		Don't Invest	Invest
Company A	Don't Invest	(0, 0)	(-20, 20)
	Invest	(-110, 0)	(50, 20)

- a. Assume that neither oligopoly assigns probabilities to the other's actions. Play this game using two solution strategies and explain what you expect the outcome to be and why.
- b. Now assume that one oligopoly (you pick the appropriate one) plays the game by assigning probabilities to the actions taken by the other firm. Explain what outcome you would expect with which range of probabilities.
- c. What does this problem tell us about the conditions under which we would expect for firms to invest in a risky new product?

2. (5 points) The Earned Income Tax Credit (EITC) is paid to low-income U.S. workers in proportion to their wage. What happens to hours worked as a result of the credit? Use a graph in your explanation. You may ignore the phase-out aspects of the credit.

3. (5 points) Margaret has the following utility function, where Y is income and L is unpaid work time:

$$U = Y^{3.5} L^{2/5}$$

If she works, she can earn \$8.00 per hour. You may assume that Margaret has 120 hours per week of time.

- a. How many hours will Margaret work? How many hours will she spend doing unpaid activities? Use the Lagrangian optimization method in your solution.
- b. What will her income be?

4. (5 points) Chapter 15, page 581, EXERCISE 6 (NOT question for review).

5. (5 points) Josh has 5 coffees and 4 donuts. Frances has 3 coffees and 7 donuts. With these endowments, Josh's $MRS_{c,d}$ is 5 and Frances' $MRS_{c,d}$ is 1. Would a reallocation such that Josh gets more coffee and fewer donuts be Pareto improving?

6. (5 points) Explain why each of these contexts results in market inefficiency, using at least one pairing of ratios of the following: marginal rates of substitution, marginal rates of technical substitution, marginal rates of transformation, marginal costs, or prices.

- a. Japan subsidizes exports of automobiles.
- b. Workers pay a social security tax on their earnings.
- c. People are short-sighted about the benefits of exercise.
- d. Residents of the United States experience government-provided protection from terrorism.
- e. Zoning regulations prohibit liquor stores from locating within 5 blocks of any other liquor store.
- f. A cable company is the sole provider of internet services.
- g. Coal fired electric utilities emit sulfur dioxide, which causes acid rain.