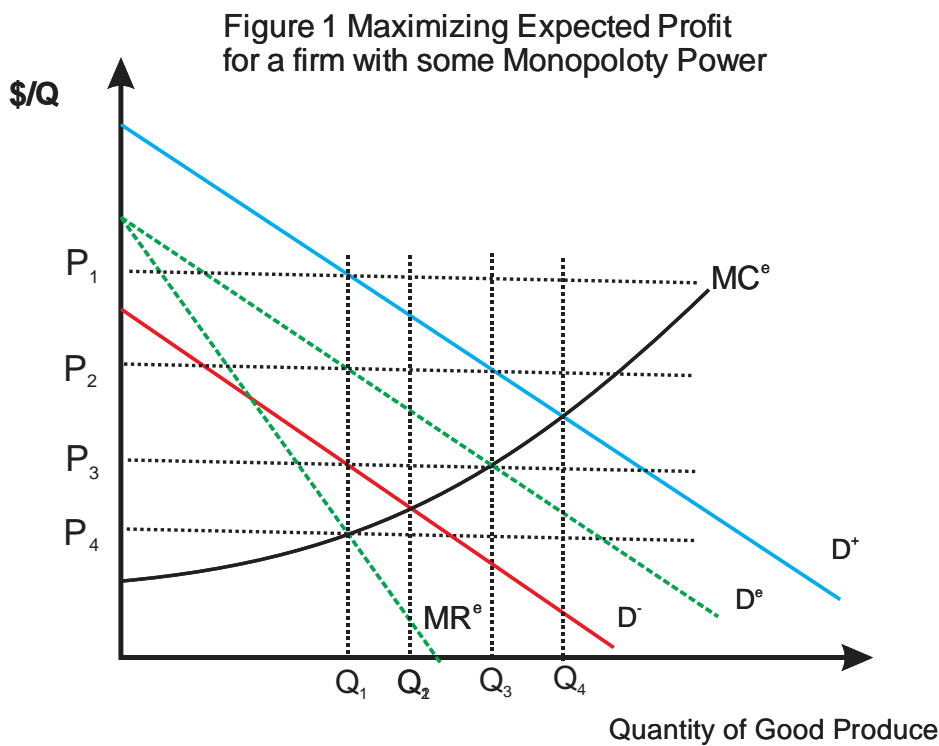


Homework 4

Econ 201H

Homework 4 reviews the expected value and present value concepts and formulae as they apply to economics. The results that you “turn in” will simply be a *list of your multiple-choice answers* ((1) d, (2) c, etc.) *in ink or typed*. Be sure to think carefully about each question, using the information provided along with any relevant ideas covered in class and in the class notes to determine which of the graphs or numbers, if any, are correct.



- (1) Figure 1 depicts a price making firm with that produces its output for a market with a randomly fluctuating demand curve. What output level maximizes the firm’s expected profits?
- a. Q_1
 - b. Q_2
 - c. Q_3
 - d. Q_4
 - e. None of the above

- (2) Figure 1 depicts a price making firm with that produces its output for a market with a randomly fluctuating demand curve. What price maximizes the firm's expected profits if the high demand outcome occurs?
- a. P_1
 - b. P_2
 - c. P_3
 - d. P_4
 - e. None of the above
- (3) Figure 1 depicts a price making firm with that produces its output for a market with a randomly fluctuating demand curve. What price is the average price observed in this market after several fluctuations of the demand curve?
- a. P_1
 - b. P_2
 - c. P_3
 - d. P_4
 - e. None of the above
- (4) Suppose that you are rolling a single cubical dice (a die) and that you'll be paid twice the value that appears on the top side after you roll it. What is the expected value of the roll?
- a. 2
 - b. 3.5
 - c. 7
 - d. 12
 - e. None of the above
- (5) Suppose that you are rolling the same dice twice and that you'll be paid twice the sum of the two rolls. The expected value of two rolls is:
- a. 4
 - b. 3.5
 - c. 7

- d. 14
 - e. None of the above
- (6) Suppose that you are in a hurry and that saving time is worth \$120/hour saved. Suppose that the probability of being fined for speeding is $1/25$ and that the fine is \$50/mph over the speed limit. (Assume also that the speed limit is 60 mph, traffic is light, that there is no additional risk of being in an accident, and that you are risk neutral.) Does it make economic sense to drive 15 miles per hour over the speed limit for an hour?
- a. Yes, the expected net benefit is \$30 less the expected cost, \$3, so expected value is greater than zero.
 - b. It's a tossup because the expected net benefit is \$30 less the expected cost, \$30, so, the expected value is equal to zero.
 - c. No, the expected net benefit is \$15 less the expected cost, \$30, so the expected value is less than zero.
 - d. This cannot be determined from the information given.
 - e. None of the above.
- (7) The annual cost of an out of state student at WVU is approximately \$42,000/year. Assume that the interest rate is 5% and that the student will graduate in 4 years. The present discounted value of the cost of his or her degree when enrolling at WVU for the first time is approximately:
- a. \$168,000.
 - b. \$149,000
 - c. \$126,000
 - d. \$85,000
 - e. None of the above
- (8) The annual benefit of a college degree from the business school at WVU is approximately \$20,000/year. Assume that the interest rate is 5% and that the student's career will last 40 years. The

- present discounted value of his or her 4 year degree when enrolling at WVU for the first time is approximately:
- a. \$800,000.
 - b. \$343,000
 - c. \$282,000
 - d. \$141,000
 - e. None of the above.
- (9) Suppose instead that the annual benefit of a college degree from the business school at WVU varies. Suppose that the probability of a \$20,000 increment is $1/3$, the probability of a \$40,000 increment is also $1/3$ and that the probability of an 80,000 increment is also $1/3$. Assume that the interest rate is 5% and that the student's career will last 40 years. The expected present discounted value of his or her 4 year degree when enrolling at WVU for the first time is approximately:
- a. \$801000.
 - b. \$659000
 - c. \$565,000
 - d. \$282,000
 - e. None of the above.
- (10) Calculate the expected PV of a lottery ticket with a prize of 100K per year for 20 years if you win. The ticket costs \$1 and there is a 1/million chance of winning. Assume that the interest rate is 5%.
- a. -0.37
 - b. +0.25
 - c. +0.37
 - d. 1.2 million dollars
 - e. None of the above