Problems for Unit 1, ECON 3357, Fall 2012, Darren Grant. Brief answers are provided below. The tutors await your visit to work on these problems, and I will discuss one or two in class before they are due.

Production
Book Sections: 6.1-6.4
Article to Read: *Squeeze Play* (on Blackboard)

1. (Ch. 6, Review #11, modified) Consider the force expended by a tug-of-war team to be a function of two inputs, the number of participants ("labor") and the length of the rope.

A) In this situation, the "production function" exhibits both diminishing returns to labor and constant returns to scale. Explain why.

B) In this situation, the marginal product of labor could become negative. Explain what this would mean, and what might cause this.

2. (Ch. 6, Exercise 2, modified) Suppose a chair manufacturer is producing in the short run (with its existing plant and equipment). The manufacturer has observed the following levels of production corresponding to different numbers of workers:

Number of Workers	Number of Chairs	Marginal Product	Average Product
1	6		
2	13		
3	21		
4	26		
6	30		
9	27		

A) Calculate the marginal and average product of labor for this production function.

B) Does this production function exhibit diminishing returns to labor? If so, when does it set in?

C) Draw the relationship between the number of workers and the number of chairs produced on a graph, as accurately as possible. Identify the area of increasing returns, the area of diminishing returns, and the area of negative returns.

3. (Ch. 6, Exercise #3) Fill in the gaps in the table below:

Quantity of Labor	Total Output	Marginal Product of Labor	Average Product of Labor
0	0	-	-
1	225		
2			300
3		300	
4	1140		
5		225	
6			225

4. Given the production function in the table below, answer the following questions. In each case, explain how you got your answer and show your work.

OUTPUT

K = 1	10	16	20
K = 2	16	20	25
K = 3	20	25	30
	L = 1	L = 2	L = 3

A) What is the marginal product of the second unit of labor when K = 1? When K = 2?

B) Does this production function exhibit diminishing returns when K=1? When K=2?

C) What is the marginal rate of technical substitution of labor for capital?

D) Does this production function exhibit constant, increasing, or decreasing returns to scale? Why?

5. (Mansfield) According to an early study conducted by the U.S. Department of Agriculture, 8,500 pounds of milk can be produced during a specified time period by a cow fed the following combinations of hay and grain:

Pounds of Hay	Pounds of Grains	MRTS of Hay for Grains
5,000	6,154	----
5,500	5,454	
6,000	4,892	
6,500	4,423	
7,000	4,029	
7,500	3,694	

A) Complete the MRTS column in the table.

B) As more hay and less grains are used, does the MRTS increase, stay constant, or decline? Is this what is supposed to happen in a typical production function?

C) Sketch out the graph of this isoquant. Does it have the expected shape?

Factor Costs and Cost Minimization
Book Sections: 7.1, 7.3

1. A firm has a budget of $1000 that it spends on labor and capital. If it purchases all labor, it can hire 25 workers; if it spends it all on capital, it can rent 10 machines.

A) Draw the firm's isocost, labeling the axes and identifying the 25 worker and 10 machine points on these axes.

B) What are the prices of labor and capital?

C) Of the three points listed below, which is above the isocost line, which is below it, and which is on it?
      1) 20 workers and 3 units of capital
      2) 10 workers and 5 units of capital
      3) 5 workers and 8 units of capital

D) It turns out that all three points listed above are on the same isoquant. What, then, can we say about the optimum input combination given this firm's budget?
      1) it definitely uses less than 5 workers
      2) it definitely uses less than 10 workers
   3) it definitely uses less than 20 workers

2.   Furry Toys Co. uses robots and workers to produce Teddy Bears using a standard production function. The rental price of a robot is $200 per day and the wage of a worker is $150 per day. Currently, 100 Teddy Bears are produced using the cost-minimizing combination of 10 robots (capital) and 8 workers.

A) Illustrate how this combination is chosen on an isoquant graph. Clearly label the axes, the 8 workers, and the 10 robots. Label the isoquant with Q0 and the isocost with C0.

B) Based on the information in the problem, what are the values of Q0 and C0? Show your work.

C)   At this cost-minimizing point, which is larger: the marginal product of one unit of labor, or the marginal product of one unit of capital? Write out the equi-marginal principle and then use it to find the answer.

3. Consider the following isocost and isoquant graph, where labor is $2 unit and capital is $1 per unit. In the short-run, there is a fixed quantity of capital: only $K = 10$ units are available for production.
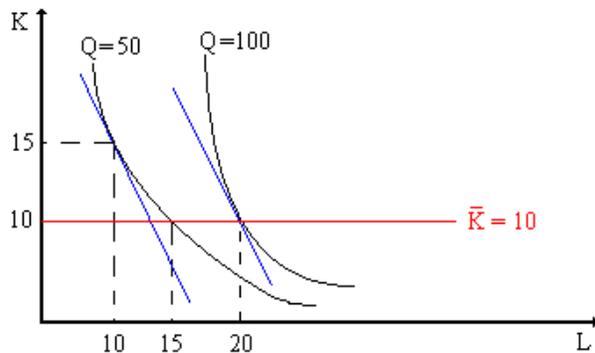
A) Find the total and variable costs of producing 100 units of output.

B) What is the short-run cost of producing 50 units of output?

C) What is the long-run cost of producing 50 units of output? Why is it below the short-run cost?

D) At which points on the graph above is the equi-marginal principle satisfied?

2010 Major League Offenses
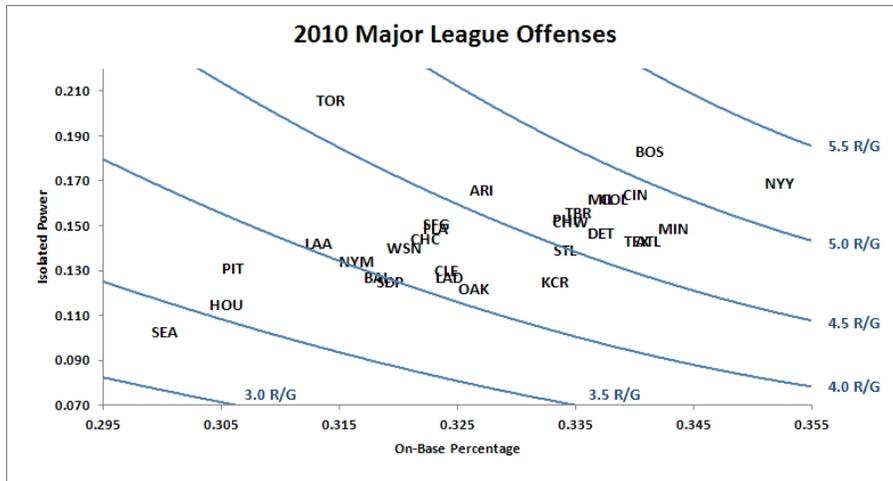
4. Consider the graph above, for Major League Baseball. The horizontal axis lists one aspect of a team's offense (batting), on-base percentage, the fraction of times a batter makes it safely to first base or beyond. The vertical axis lists another aspect, the team's power, or slugging. A team that hits a lot of home runs hits with power. R/G stands for the average number of runs scored per game; more is better. Each team is identified on the graph according to their on-base percentage and power.

A) Do the isoquants take the usual shape?

B) Assume Baltimore (BAL) and San Diego (SDP) are maximizing their offensive output given their player budgets. Then, what does the isocost look like? Draw it in on the graph.

C) Based on the graph, which team appears not to have selected an optimal mix of on-base percentage and slugging? How should this show up in their offensive performance? For this team, what will the intersection of the isocost and isoquant look like?

D) Draw out the approximate expansion path on the graph above.

5. (Mansfield, modified) A 1-pound weight can be achieved for a broiler chicken during a specified period if the broiler is fed any of the following combinations of corn and soybeans.

Pounds of Corn	Pounds of Soybeans	Total Cost in Dollars
1.0	.95	
1.1	.76	
1.2	.60	
1.3	.50	
1.4	.42	

A) If the price of a pound of corn and the price of a pound of soybeans are both $5, what is the cost of each combination? What is the minimum-cost combination or combinations, of those shown above?

B) If the broiler chicken is fed 1.3 pounds of corn and 0.60 pounds of soybeans, the weight gain will be 1.07 pounds. With this information and the information in the table, you can calculate the marginal products of corn and soybeans at the cost-minimizing input combinations. Do so.

C) Using your answer to B) and the prices of corn and soybeans, show that the equi-marginal principle is satisfied at the cost-minimizing input combination.

D) Calculate the MRTS (ΔSoybeans/ΔCorn) between each pair of adjacent points in the table. Does the MRTS decline as it is supposed to?

<u>Brief and Partial Answers</u>

Production

1. Yes, because one concerns the short run and the other the "long run," adding both people and rope.

2. The marginal product of the 4th worker is 5 chairs.

3. The average product of 3 workers is also 300.

4. When K = 1, MPL = 6. To look at diminishing returns, increase labor while holding capital constant. To look at scale, increase both labor and capital at the same time.

5. The MRS ranges between 0 and 2, decreasing as you move down the table, as it should.

Factor Costs and Cost Minimization

1. Point #3 is on the isocost.

2. Q0 is 100, C0 = $3200. The equi-marginal principle implies $MP_L < MP_K$, since $P_L < P_K$.

3. The short run costs of 50 units are $40. The long run costs are $35. The equi-marginal principle is satisfied at the $35 point but not the $40 point.

4. Yes, they do, and the outlier is Toronto. Their runs per game will be lower than they could have achieved with the same budget, if they spent less on power hitters and used the money to get players who get on base more often.

5. There are two minimum cost combinations. One of them is 1.2 lbs corn and 0.6 lbs soybeans. The optimum combination, however, is slightly more than 1.2 lbs corn and slightly less than 0.6 lbs soybeans.

Homework Problems for Unit 2, ECON 3357, Darren Grant, Fall 2012. We will go over few of these in class. The tutors are prepared to help you with these.

Short Run Costs and Output Decisions
Book Sections: 7.1 (review), 7.2, 7.3 (review), 8.4
Article to read: Family Physician Article (on Blackboard)

1. (Ch. 7, Review #3) Explain whether the following statements are true or false.

A) If the owner of a sole proprietorship works in the business but pays himself no salary, then the accounting cost is zero, but the economic cost is positive.

B) A firm that has positive accounting profit does not necessarily have positive economic profit.

C) If a firm hires a currently unemployed worker, the opportunity cost of utilizing the worker's services is zero.

2. (Ch. 7, Exercise #2, modified) Fill in the blanks in the table.

Units of Output	Fixed Cost	Variable Cost	Total Cost	Marginal Cost	Average Total Cost
0	100				
1		25			
2				20	
3			157		
4			177		
5					40.4
6				34	
7		170			
8			326		
9				72	
10					49

3. (Ch. 7, Exercise #7) The cost of flying a passenger plane from point A to point B is $50,000. The airline flies this route four times per day at 7 AM, 10 AM, 1 PM, and 4 PM. The first and last flights are filled to capacity with 240 people. The second and third flights are only half full. Find the average cost per passenger for each flight. Suppose the airline hires you as a marketing consultant and wants to know which type of customer it should try to attract: the off-peak customer (the middle two flights) or the rush-hour customer (the first and last flights). What advice would you offer?

4. Consider a perfectly competitive firm where, for simplicity, we can think of all costs as being labor costs, and there is only one worker. The worker can make one unit of the product in 4 hours of work. The firm pays the worker $20 per hour, up to 40 hours per week (straight time). After that the worker is paid overtime, which is "time and a half," or $30 per hour. The

firm also provides (pays for) health insurance for its employee (the only fringe benefit), at a cost of $50 per week (no matter how many hours are worked).

The firm can choose the number of weekly hours its employee will work; this can be less than 40 hours or more than 40 hours, as the firm chooses. All units refer to weekly output. Since the worker takes 4 hours to make one unit of the product, the worker works overtime if he makes more than 10 units per week.

A) Is labor a fixed cost or a variable cost? Is health insurance a fixed cost or a variable cost?

B) What is the Marginal Cost of a unit produced during straight time? What is the Marginal Cost of a unit produced during overtime?

C) What is the marginal product of an hour of labor? Confirm that MC = w / MPL.

D) If the product sells for $100 per unit, should the firm have the worker work overtime? Explain, briefly but clearly, why or why not.

E) If the product sells for $100 per unit, what is the firm's revenue, total costs, and profit?

5. A firm is currently operating at the intersection point in the graph at left.

A) Is the firm currently minimizing the costs of producing this level of output? Explain why or why not.
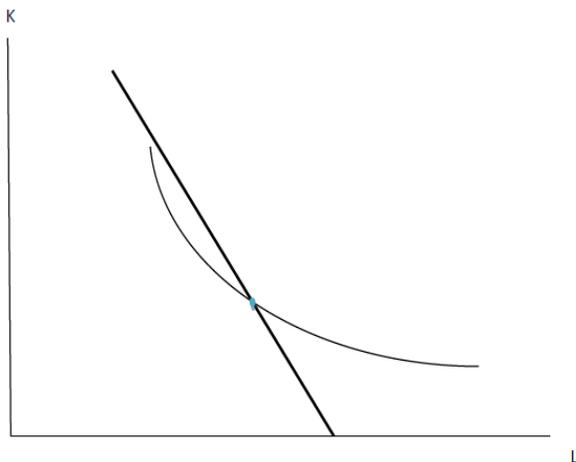
B) If the firm wishes to minimize costs while keeping its output level fixed, how should it achieve this? Illustrate on the graph.

C) If the firm wishes to achieve maximize output while keeping its total costs the same, how should it achieve this? Illustrate on the graph.

D) In the short run, did the firm probably experience an increase or a decrease in the product price? How do you know?

6. Consider the diagram below where a perfectly competitive firm faces a price of $40. AC represents average total cost, and AVC represents average variable cost. (We really haven't discussed AVC, but that won't impede your ability to answer these questions.)

A) What is the profit maximizing output?

B) The firm earns zero profit at what levels of output?

C) At 67 units of output, is profit maximized? It is positive or negative?

D) At the profit-maximizing level of output, what is ATC?

E) At the profit-maximizing level of output, which of the following are minimized: MC, ATC, AVC? Answer yes or no for each.

F) At the profit-maximizing level of output, what is total revenue and total profit (in dollars)?
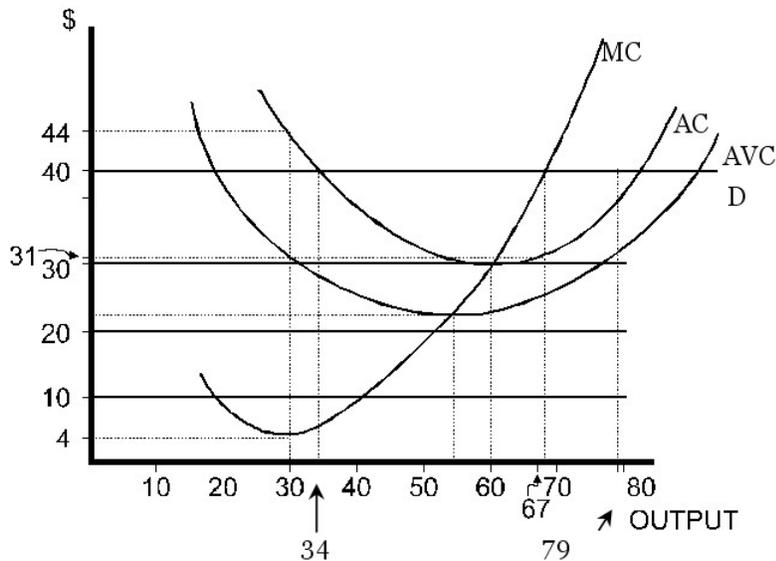
Scale, Long Run Costs and Long Run Equilibrium

Book Sections: 7.4, 8.7
Article to read: Egg Recall article (on Blackboard)

1. (Ch. 8, Review # 6) At the beginning of the twentieth century, there were many small American automobile manufacturers. At the end of the century, there were only three large ones. Explain this phenomenon in terms of economies of scale and the industrialization of automobile manufacturing.

2. In costs question #4, above, assume the market is composed of firms like the one described in that question. Then, in long run equilibrium, what will the price be and how many units will each firm make?

3. Below are given the marginal cost curves for two different firms in a perfectly competitive market. The two firms use two different technologies to make the product. (Both firms make the same product, of course.) These technologies are freely available to all, one is just newer than the other. Type A firms have the old technology and Type B firms have the new technology.
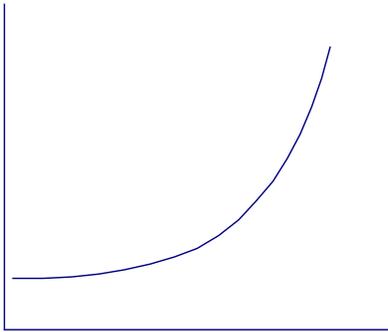
TYPE A   TYPE B
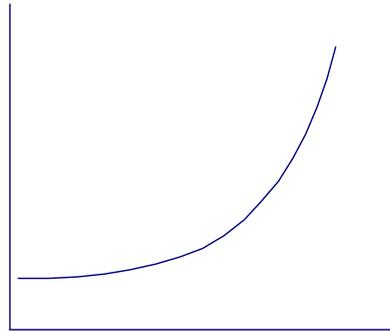
Currently, Type A firms are making a negative economic profit, while Type B firms are making a positive economic profit. The MC curve for each type of firm is drawn above.

A) Do Type A and Type B firms charge the same price for the product, or different prices?

B) Draw out, on the axes provided, an ATC curve for each type of firm, consistent with the information given above.

C) How do the two technologies differ: in their variable costs, their fixed costs, or both?

D) Over time, for firms of Type A, do you expect entry, exit, or neither? Explain. What about firms of Type B?

E) Given enough time, this perfectly competitive market will achieve long run equilibrium. When it does, what will the price be, and what will firms' economic profits be? (Illustrate the price with a label on a graph.) Which technology or technologies will be used?

4. A firm uses 40 units of labor and 60 units of capital to produce 1000 units of the product. To produce 2000 units it uses 80 units of labor and 120 units of capital. To produce 3000 units it uses 120 units of labor and 180 units of capital. And to produce 4000 units it uses 200 units of labor and 300 units of capital.

A) Where does this firm exhibit decreasing returns to scale? Constant returns? Increasing returns?

B) On an isoquant graph, show all four points identified above, and draw out the associated isocosts and the expansion path.
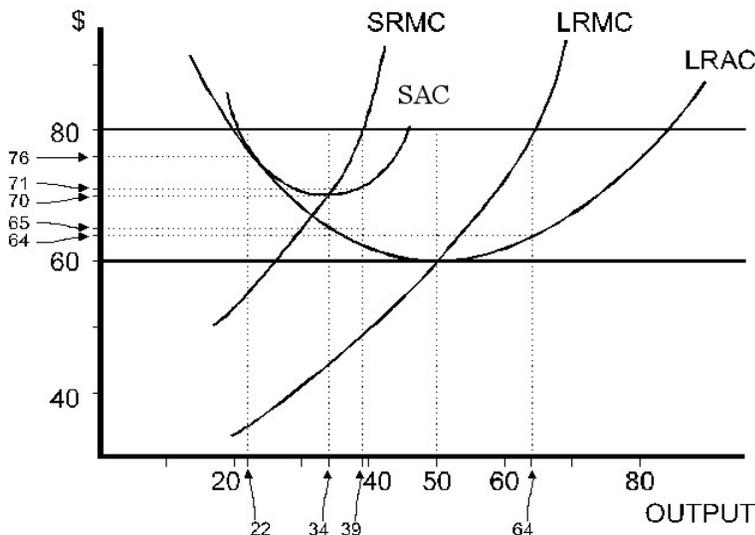
C) Draw a long run average total cost curve for this firm, and identify all four points on it.

D) For a firm that employs 120 units of capital, draw the short run average total cost curve on the graph in C).

E) If each unit of labor costs $30 and each unit of capital costs $40, then what are the values of LRATC at 1000, 2000, 3000, and 4000 units?

5. The following table contains information for a price taking competitive firm. Complete the table and determine the profit maximizing level of output (round your answer to the nearest whole number).

Output	Total Cost	Marginal Cost	Fixed Cost	Average Cost	Total Revenue	Average Revenue	Marginal Revenue
0			25				
1	35						
2				30			
3		45					
4	185						
5				57			
6		120			300		

6. Refer to the figure above, which displays the cost curves for a particular firm in a perfectly competitive market. The LR cost curves in the figure are typical of all firms in this market.

A) At P = $80, what is the profit-maximizing output in the short run?

B) At P = $80, how much is profit in the short run?

C) As the firm makes its long-run adjustment, which must be true?
    1) It takes advantage of increasing marginal product.
    2) It suffers from decreasing returns to scale.
    3) It takes advantage of increasing returns to scale.

D)   As the competitive industry, not just the firm in question, moves toward long-run equilibrium, the firm will be forced to operate at what level of output? What will the price be? How much profit will the firm earn?

Brief and Partial Answers

Costs

1. a and b are true.

2. For Q=4, FC = 100, VC = 77, MC = 20.

3. The average cost per passenger is higher on the flights that aren't full but those are the flights where you should try to add passengers!

4. Work a regular 40 hour week, because MC < $100 during straight time and MC > $120 during overtime.

5. No, it is not minimizing its costs. For B-D, move to a point of tangency--with an isoquant or isocost you would have to draw in—between an isoquant and isocost.   In each case the direction you move, going to that point of tangency, is different.

6. This firm makes positive economic profit but does not minimize average costs.

LR Equilibrium and Value Creation

1. Economies of scale became large with the advent of assembly lines

2. Find ATC at 10 units, which is where ATC is minimized.

3. Since MC is the same for the two technologies, one must have lower fixed costs. This question is about the movement of an industry from a more expensive technology to a cheaper technology, caused by the exit of firms with the older technology and the entry of firms with the newer technology.   Long run equilibrium will occur at P = min ATC for the new technology.

4. For part, but not all, of the expansion path this firm experiences constant returns to scale.

5. To get the price, look at the last row of the table. Everything else flows from there!

6. In the short run, this firm is not taking advantage of economies of scale. Over time it will be forced to as the price falls.

Homework for Unit 3, ECON 3357, Darren Grant, Fall 2012. We will go over these in class. The tutors are prepared to help you with all of these.

Consumer Preferences and Demand
Book Sections: 3.1-3.3, 4.2
Article to Read: Dollar Stores Article, on Blackboard

1. (Ch. 4, Review #8, 11) For which of the following goods would a price increase lead to a substantial income effect? For which would there be a substantial substitution effect?

A) Salt

B) Housing

C) Food

D) A specific brand of toothpaste

E) Toothpaste in general

2. (Ch. 4, Review #6) If the price of one of the goods increases, explain the effect on the quantity demanded of the other good. Which pairs are complements are substitutes?

A) Tortilla chips and salsa

B) Tortilla chips and potato chips

C) Movie tickets and popcorn

D) Travel by bus and travel by subway
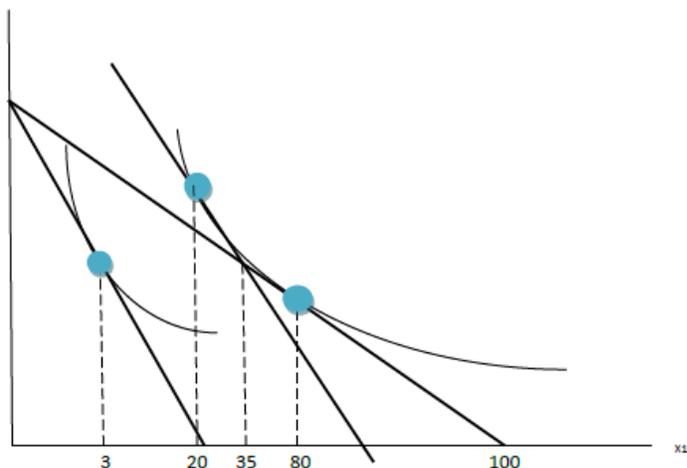
3. In the figure above, x1=80 represents the optimal choice of the amount of good X1 to consume at the original prices and income. Then P1 (the price of x1) increases.

A) How much did P1 increase: by double, more than double, or less than double? How do you know?

B) What is the total change in x1 after the increase in P1?

C) What is the income effect from the increase in P1?

D) What is the substitution effect from the increase in P1?

E) What kind of good is x1: inferior or normal? How do you know?

4. Suppose Caroline is indifferent between tea and coffee as long as she consumes an equivalent amount of caffeine. Suppose that coffee has twice as much caffeine as tea.

A) Draw out an indifference curve for Caroline over coffee and tea, with coffee on the horizontal axis and tea on the vertical axis. Make sure it has the correct shape and slope.

B) What is the MRS of coffee for tea?

C) Caroline buys all coffee and no tea. What do we know about the prices of coffee and tea?

5. A consumer can choose to purchase two goods, candy (C) and guns (G). At current prices and her current income, she is currently consuming her optimum bundle, C_A and G_A. The government would like to encourage her to purchase more candy and fewer guns, while holding her utility constant. Call this bundle C_B and G_B.

A) Draw an indifference curve graph, including an indifference curve, the two consumption bundles, and the current budget line.

B) One way to get the consumer to move to the new bundle would be by changing both the price of candy and the consumer's income. Does the price of candy go up or down? What about income? Draw this new budget line on the graph.

C) Another way to achieve this goal is by changing both the price of guns and the consumer's income. Which of these go up? Which go down?

D) Still another way would be by changing the prices of guns and candy at the same time. Which goes up, and which goes down?

6. To combat global warming, the Democrats wish to increase the gas tax. To prevent overall taxes from going up, the Republicans agree only if income taxes are lowered to compensate, so that the typical consumer can afford to buy the same amount of gas as before, which is 800 gallons per year, and still have the same amount of money left over to buy other goods.

A) Draw axes with gasoline on the horizontal and "other goods" on the vertical. Draw a pre-tax budget line on this graph, for the typical consumer, and identify 800 gallons of gas (this can be almost anywhere).

B) Now draw a new, post-tax budget line that goes through the same consumption bundle. Is it flatter or steeper than the original budget line?

C) Draw the indifference curve that contains this consumption bundle. Which budget lines or budget lines is it tangent to?

D) So, does the tax get people to buy less gasoline? Answer using the graph you have drawn.

Demand and Elasticity
Book Reading: 4.1, 4.3
Article to Read: Gasoline article, on Blackboard, for *Nov. 12* (which is not the homework day)

1. (Ch. 4, Review #3) Explain whether the following statements are true or false:

A) The marginal rate of substitution diminishes as you move along a convex indifference curve.

B) The marginal rate of substitution diminishes as an individual moves downward along the demand curve.

C) The level of utility increases as an individual moves downward along the demand curve.

2. (Ch. 4, Exercise #9, modified) The ACME Corporation determines that at current prices, the demand for its computer chips has a price elasticity of -2 in the short run, while the price elasticity for its disk drives is -1/2.

A) If the corporation decides to raise the price of both products by 10 percent, what will happen to the quantity of computer chips sold? To the quantity of disk drives sold?

B) If both products' prices are increased by 10 percent, what will happen to the company's revenue from computer chips? To the revenue from disk drives?

C) Can you tell from the available information which product generates the most revenue? Why or why not?

3. (Ch. 4, Exercise #12) You run a small business and would like to predict what will happen to the quantity demanded for your product if you raise your price. While you do not know the exact demand curve for your product, you do know that in the first year you charged $45 and sold 1200 units and that in the second year you charged $30 and sold 1800 units.

A) Calculate the elasticity of demand, using the arc elasticity formula.

B) If you raise your price by 10%, what will happen to quantity demanded, in percentage terms?

C) Calculate the revenue earned at a price of $45 and the revenue earned at a price of $30. How do they compare? Does this finding make sense in light of the elasticity you calculated?

4. Several years ago, the postal service needed to increase its revenue, in order to offset increased expenses. They decided to increase the price of regular stamps (for regular letters), and also to increase the price of Express Mail (overnight delivery), both by 10%. While there aren't any competitors in letter service, other companies like Federal Express also offer overnight delivery, though not under the same name.

A) There are two products that the postal service offers here, regular letter delivery and Express Mail. The demand for one is elastic and the other inelastic. Which is which? Why?

B) Based on your answer to part A, should (did) revenue go up in: both letters and Express Mail, just Express Mail, or just letters? Briefly explain.

C) What will happen to the number of stamps purchased? Choose one answer and briefly explain.
      1) it will go down by more than 10%
      2) it will go down by less than 10%
      3) it will go up

D) What will happen to the number of overnight packages sent via Express Mail? Choose one answer and briefly explain.
      1) it will go down by more than 10%
      2) it will go down by less than 10%
      3) it will go up

5. Many concepts covered in this unit also apply to the demand for labor and capital in production. In this question we consider the demand for labor and capital in producing national defense. Initially the government has a draft, so that it can pay low wages to soldiers. It chooses the optimum mix of labor and capital in producing national defense.

A) Illustrate this mix on an appropriate graph.

Then the draft is taken away, so the "price" of soldiers rises, since the Armed Forces must pay more to get them to enlist.

B) If total spending on national defense doesn't change, how is the use of labor and capital affected? Illustrate on the graph you have drawn.

C) If the government adjusts its total spending so that it can maintain the original level of national defense, how is the use of labor and capital affected? Illustrate on the graph you have drawn.

D) The movement between the bundles chosen in part A) and part C) illustrates which of the following: the income effect, the substitution effect, or both?

Answers

Consumer Preferences

1. The income effect is substantial only for housing and food.

2. A and c are complements.

3. The price increased by a factor of five. The substitution effect was 60 units and the income effect 17 units. Since the income effect lowered consumption, this is a normal good: less purchasing power, less purchases.

4. This indifference curve takes a special shape, discussed in class and in your book. The customer will buy all coffee or all tea, depending on the price: whichever gives the most caffeine for the buck.

5.   Initially, the budget line and indifference curve are tangent at Bundle A. Then they are tangent at Bundle B. One way to do this is to lower the price of candy and reduce income at the same time.

6. The actual consumption bundle is in the middle of the graph somewhere, because people buy lots of other stuff as well as gas. The new budget line will go through this same point but have a different slope, because gas costs more but the consumer can afford the same bundle. The tax does get people to buy less gasoline, and this should come through on the graph.

Demand and Elasticity

1. They are all true

2. Sales and revenue will fall for computer chips, but you don't know which good generates the most revenue without knowing the demand curves themselves.

3. Multiply your elasticity, calculated using the midpoint formula, by 10%, and that will tell you the expected change in quantity.

4. There is no good substitute for letters, but there are lots of competitors—good substitutes—for Express Mail. So letters are inelastic, so the price increase will lead to a smaller (percentage) change in quantity and revenue will rise. This is not so for Express Mail.

5. It is just the substitution effect, because you have added enough money into the Armed Forces budget to get back to the original level of production, that is, national defense.

Homework 4, ECON 3357, Darren Grant, Fall 2012.

Price Setting
Book Sections: 10.1, 10.2
Article to Read: Getting Textbooks Cheaper from India (quiz on Blackboard)

1. (Ch. 10, Review #1, 3, Exercise #1, 2) A miscellany of short answer questions.

A) A monopolist is producing at a point at which marginal cost exceeds marginal revenue. How should it adjust its output to increase profit?

B) Will an increase in the demand for a monopolist's product always result in a higher price? Explain.

C) Caterpillar Tractor has hired you to advise it on pricing policy. One of the things the company would like to know is how much a 5-percent increase in price is likely to reduce sales. What would you need to know to help the company with this problem?

D) A monopolist firm faces a demand with constant elasticity of - 2.0. It has a constant marginal cost of $20 per unit and sets a price to maximize profit. If marginal cost should increase by 25 percent, would the price charged also rise by 25 percent?

2. (Ch. 10, Exercise #5) The following table shows the demand curve facing a monopolist who produces at a constant marginal cost of $10:

Price	Quantity	Revenue	Marginal Revenue
18	0		-----
16	4		
14	8		
12	12		
10	16		
8	20		
6	24		

A) Fill in the revenue and marginal revenue columns in the table.

B) What are the firm's profit-maximizing output and price? What is its profit?

C) If the firm's fixed costs are $40, what is this firm's profit?

3. (Ch. 7, Exercise #7) Suppose a profit-maximizing monopolist is producing 800 units of output and is charging a price of $40 per unit.

A) If the elasticity of demand is -2, find the marginal cost of the last unit produced.

B) What fraction of the price consists of markup?

C) On a graph, draw the firm's demand, marginal revenue, and marginal cost curves. Then, identify the profit maximizing price and quantity on the graph, and numerically label the price and quantity. Also numerically label the marginal cost you calculated in part A).

4. A price setting firm charges 75% markup—that is, 75% of its price is a markup over marginal cost. Yet it claims to be making an economic profit of zero.

A) Is this possible? Choose one of the responses below, and carefully explain why.
      1) this is not possible
      2) this is possible, but the firm cannot be charging the optimum price
      3) this is possible, and the firm could be charging the optimum price

B) Calculate the elasticity of demand.

5. A firm has marginal costs of $100 per unit and total fixed costs of $5000. It has tried two different prices for its product: a price of $200, at which it sold 525 units, and a price of $250, at which it sold 350 units.

A) Show that the profit under the two prices is the same.

B) What is the elasticity of demand?

C) Since profits are the same either way, one might conclude the price doesn't really matter. Or is there a price that is superior to both $200 and $250? How would you find it?

6. The demand curve and MC curve for Ft. Worth Cats games is shown below. The baseball stadium has 3,000 seats. The Cats play one game each week, and they keep all gate receipts.
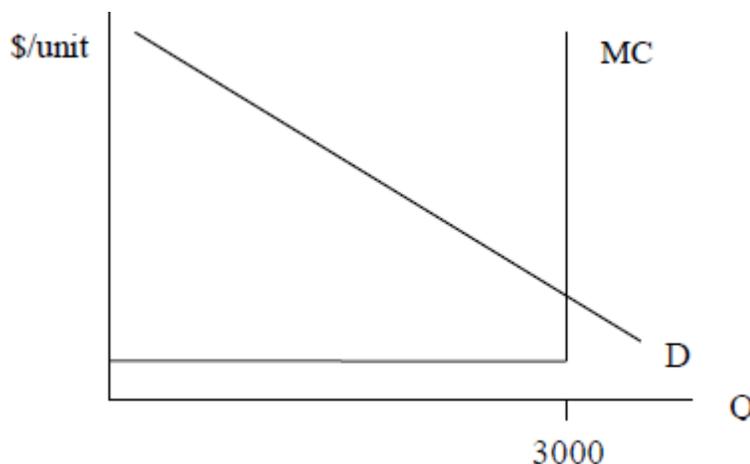
A) Why is the MC curve so low? Why does it become vertical at Q = 3000?

B) At what price does the stadium sell out? Illustrate on the graph.

C) Draw an MR curve on the graph above, in the appropriate place. Based on this MR, do the Cats maximize their revenue by selling out the stadium? Explain.

D) What is the Cats' profit-maximizing price? Illustrate on the graph.

E) Can you tell what kind of profit the Cats make at this price?

F) At the price chosen in part D) the Cats almost, but not quite, maximize their revenue. Explain why.

7. (Ch. 10, Exercise #17, modified) *Bonus Question to Be Discussed on the Last Class Day.* The town of Springfield obtains all of its electricity from one company, Burns Electric, which is owned by the city. The CEO of the company claims it makes economic sense to charge a monopoly price for electricity, because otherwise each citizen would have to pay higher property taxes to make up the lost revenue.

A) Is this true or false? Explain.

B) Draw an indifference curve graph with electricity on the horizontal axis and "other goods" on the vertical, and the budget line, such that the consumer chooses the utility maximizing combination of electricity and other goods.

C) Now, lower the price of electricity a little bit, and raise citizens' taxes so that they can consume the same bundle of electricity and other goods as before. Draw the new budget line on the graph in B, and the new bundle chosen. Are consumers better off than before?

D) Though the price has fallen, it is still above marginal cost. Does the city, through taxes and electricity profits, have more revenue than before?

Answers

1. A) Make less B) No D) Yes

2. At Q = 8, MR = 12. This is the optimum quantity, since additional units have MR < MC.

3. The monopolist's pricing rule is: $(P-MC)/P= -1/E_D$, using -2 for the elasticity and 40 for price, solve to find MC=20. In percentage terms, the mark-up is 50%, since marginal cost is 50% of price.

4. Sure it is possible—fixed costs could be high. Demand has an elasticity of 4/3.

5. The elasticity is 1.8, so the price should be 100/(1-1/1.8) = $225.

6. It is not profit maximizing to sell out the stadium.

7. It does not make sense—both citizens and the city can be better off with higher taxes and a lower price, as long as the price is still greater than or equal to marginal cost.