Multiple choice: 4 pts. each, circle correct answer.

1. Ralph and Gordon run a sale on Pepsi 2-liter bottles. They cut price from $.99 to $.89. In response, Coca-Cola 2-liter bottle sales drop by 30%. From this we can conclude that cross-price elasticity of demand between Pepsi and Coke is approximately

    B
    a) 0.33
    ⓑ 3
    c) -0.33
    d) -3

    $$\varepsilon_{x, P_y} = \frac{\% \, \Delta \, Q_x}{\% \, \Delta \, P_y} = \frac{-30\%}{-10\%} = 3$$

2. When the price of gasoline in Italy is $5 per gallon, Fabio consumes 1000 gallons per year. The price rises to $5.50, and to offset the harm to Fabio, the Italian government gives him a cash transfer of $500 per year.

    B
    a) Fabio will be better off after the price increase plus transfer and will consume more gasoline.
    ⓑ Fabio will be better off after the price increase plus transfer and will consume less gasoline.
    c) Fabio will be worse off after the price increase plus transfer and will consume more gasoline.
    d) Fabio will be worse off after the price increase plus transfer and will consume less gasoline.

3. The price consumption curve for trinkets is a ^(horizontal) straight line. From this we can conclude

    D
    a) That income elasticity of demand for trinkets is zero.
    b) That own-price elasticity of demand for trinkets is greater than one.
    c) That own-price elasticity of demand for trinkets is less than one.
    ⓓ That own-price elasticity of demand for trinkets is equal to one.

4. The University Of Kentucky price discriminates between in-state and out-of-state students. Kennedy's Bookstore does not price discriminate between in-state and out-of-state students. The reason for this is

    B
    a) UK is attempting to maximize social welfare, while Kennedy's is simply trying to maximize profits.
    ⓑ UK is able to prevent arbitrage, while Kennedy's is not.
    c) UK is able to identify out-of-state students easily, while it would be impractical or impossible for Kennedy's to distinguish between in-state and out-of-state students.
    d) Price discrimination usually results in a decline in profits, so Kennedy's is not interested.

5. Suppose 5 laborers working on 10 acres of land are able to produce 4000 bushels of corn, and 6 laborers working on 12 acres of land are able to produce 5000 bushels of corn. Production is characterized by
   a) Increasing returns to scale. *(circled)*
   b) Constant returns to scale.
   c) Decreasing returns to scale.
   d) Diminishing marginal returns.

A

6. Suppose that a bug zapper is developed and marketed that actually kills disease-carrying mosquitoes, instead of just harmless moths. If I buy and install one of these new zappers in my backyard, it kills mosquitoes from all over my neighborhood. The market outcome
   a) Will be inefficient. Too few bug zappers will be bought relative to the social optimum. *(circled)*
   b) Will be inefficient. Too many bug zappers will be bought relative to the social optimum.
   c) Will be efficient. Consumers will all have the same MRS between zappers and other goods.
   d) Will be efficient. Producers will have an incentive to combine inputs so as to minimize the costs of producing zappers.

A

7. Suppose that the MC faced by Delta on its Lexington-Atlanta route is a constant $100 per customer. Among customers who are willing to stay over on a Saturday night, demand is also constant and equal to 5. What price should Delta charge these customers?
   a) $125 *(circled)*
   b) $150
   c) $175
   d) $200

A

$$\frac{P - mc}{P} = \frac{1}{\varepsilon_{x, P_x}}$$

8. The common MRS across all consumers between food and clothing is 3 food for 2 clothing. Society is at a point on the PPF such that the MRT between food and clothing is 2 food for 3 clothing. As supreme dictator, you should
   a) Do nothing, since the allocation of resources is Pareto optimal.
   b) Escape to Switzerland, since a revolution may be brewing.
   c) Order that resources be shifted out of the production of clothing and into the production of food.
   d) Order that resources be shifted out of the production of food and into the production of clothing. *(circled)*

D

$$MRS = \frac{3F}{2C} \qquad MRT = \frac{4F}{6C}$$

9. (30 pts.) Albert is a poor undergraduate student majoring in physics. His monthly income is $100, and he consumes only two goods, Raman noodles (R) and other goods (OG). Initially the price of other goods is $1 per unit, and the price of Raman noodles is $1 per package. Albert is a clear-thinking and rational person, and under these conditions he is happiest if he consumes 50 packages of Raman noodles per month. Now, the price of Raman noodles falls from $1.00 to $.50 per package. In response, Albert increases his consumption to 70 packages per month.

   a) Using indifference curves and budget lines, illustrate Albert's initial situation and new situation in the attached diagram.

   b) Next month Albert is planning to graduate. He is going to have to pay library fines and parking tickets that will reduce his income from $100 to $70. In thinking about how he will spend his $70 income, he is confident that he will be just as happy when his income is $70 and the price of Raman noodles is $.50 as he was when his income was $100 and the price of Raman noodles was $1.00. He anticipates that he will want to consume 80 packages of Raman noodles next month. With that information, illustrate the income and substitution effects for Albert when his nominal income is fixed at $100 and the price of Raman noodles falls from $1.00 to $.50 per package.

   c) What type of good is Raman noodles for Albert? Compute his income elasticity of demand for Raman noodles.

(a) initial: point ①
    with RN = 50 and OG = 50

    later: point ③
    with RN = 70 and OG = 65
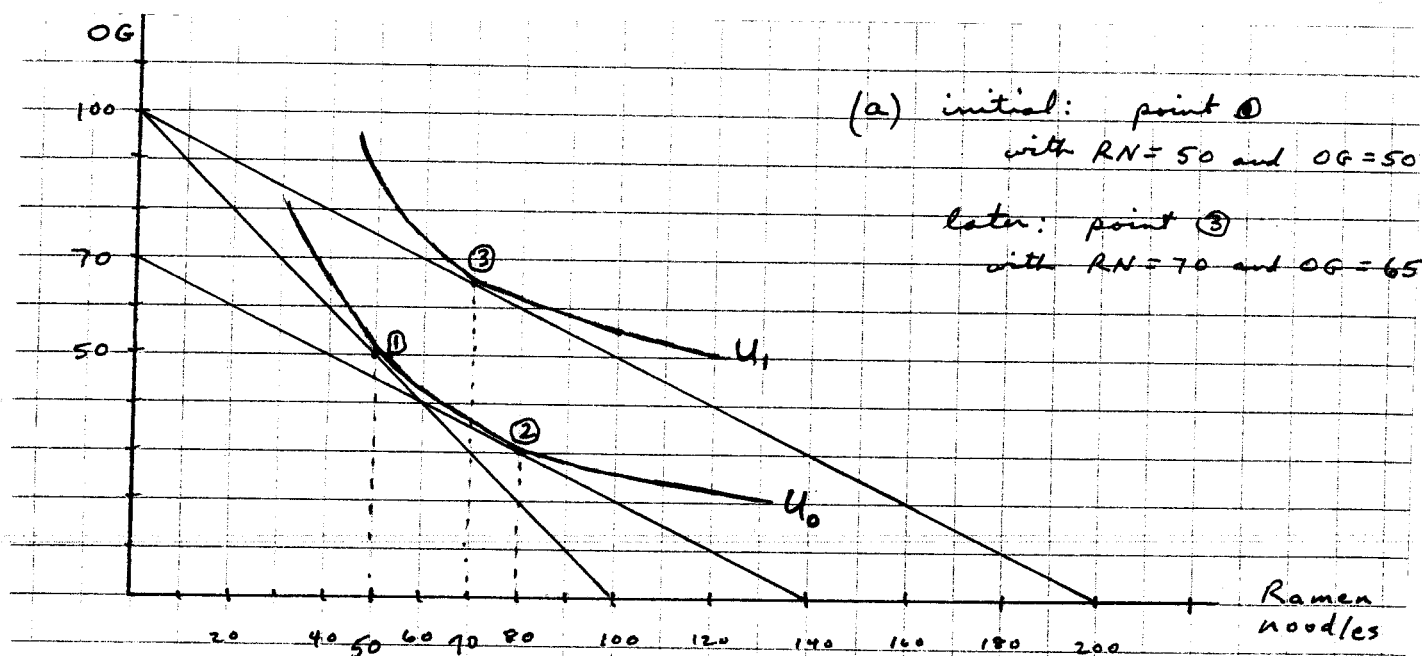
(b) substitution effect: change relative prices but keep utility the same ⟹ ① → ②

income effect: keep relative prices the same but increase nominal income from $70 to $100 ⟹ ② → ③

(c) $\varepsilon_{x,I} = \dfrac{\%\,\Delta x}{\%\,\Delta I} = \dfrac{\dfrac{70-80}{\frac{1}{2}(70+80)}}{\dfrac{100-70}{\frac{1}{2}(100+70)}} = \dfrac{-\dfrac{10}{75}}{\dfrac{30}{85}} = -0.377$ inferior

10. (20 pts.) Betsy and Bubba open a coffee and sandwich shop. Betsy runs the business, and Bubba drops in every now and then for lunch. In their first year of operation, they sell $75,000 worth of food and drinks. Their income statement reflects the following explicit costs:

Wages for hourly employees	$10,000
Taxes and utilities	$6,000
Wholesale food costs	$25,000
Insurance	$2,000

Betsy quit a job where she was making $1500 **per month**. She works full time in the shop but doesn't pay herself any salary. Betsy and Bubba took $20,000 out of savings where it was earning 10%. $10,000 of that is tied up as working capital in the business, and they would get all of that back if they were to liquidate or sell the business. The other $10,000 was used to buy an espresso machine, a refrigerator, furniture, and a cash register. All of this physical capital has an expected life of ten years, and depreciates on a straight line basis with no anticipated scrap value at the end of ten years. Finally, Bubba and Betsy own the strip mall where their shop is located. They previously rented the space to another tenant, at a rental rate of $1000 **per month**. Betsy turns to you for advice, since you have had a course in intermediate microeconomics. She likes working for herself, but wonders if it is costing her anything to do so. She asks you to evaluate the economic profitability of her business.

Explicit Costs

wages	$10,000
taxes + util.	6,000
food costs	25,000
insurance	2,000
	$43,000

Revenues

$75,000

Net Revenue (accounting profit) = $32,000

Implicit Costs

opportunity cost of Betsy's time = $18,000
($1500/mo × 12 mos)

foregone interest earnings = $2,000
($20,000 × 10%)

depreciation = $1,000
10 yrs → $\frac{1}{10}$ × $10,000

foregone rent = $12,000
($1000/mo × 12 mos)

Total implicit costs = $33,000

So it is costing Betsy $1000 to run her own shop instead of working elsewhere and renting out the space and keeping the savings in the bank. Only she can determine if it is worth it.

11. (30 pts.) The taxi business is inherently perfectly competitive. In the Louisville metropolitan area, the market demand curve for taxi rides is given in the diagram below. The ATC and MC curves for a typical taxi cab operator are also illustrated below. Price is measured in dollars per mile, while quantity is measured in number of taxi cab rides per week.

   a) Draw the short-run market supply curve that is consistent with the taxi market being in long-run equilibrium. What will market price and output be? How many rides per week will the typical cabbie supply, and how many cab operators will there be?

   b) Now suppose that city government decides to stop subsidizing the city bus system, and bus prices rise dramatically. In response, demand for taxi rides increases by 2000 rides per week at each possible price. Draw the new market demand curve, and label it D'. What will happen to price in the short run? In the long run? What will happen to the number of taxi operators in the long run?

   c) Suppose that, prior to the increase in demand, city government implements a medallion system whereby each of the original cab operators is issued a license to operate a cab in Louisville, and that no new licenses/medallions are issued. Then demand increases as in (b). If medallions are transferable, i.e., they can be bought and sold, explain how the market price of a medallion will be determined.

(a) $S_{SR} = \sum mc$, where $P = \$.50$ and $Q = 5000$

if $q^* = 100$ for typical cab operator, then $n = \dfrac{Q}{q}$

or $n = \dfrac{5000}{100} = 50.$
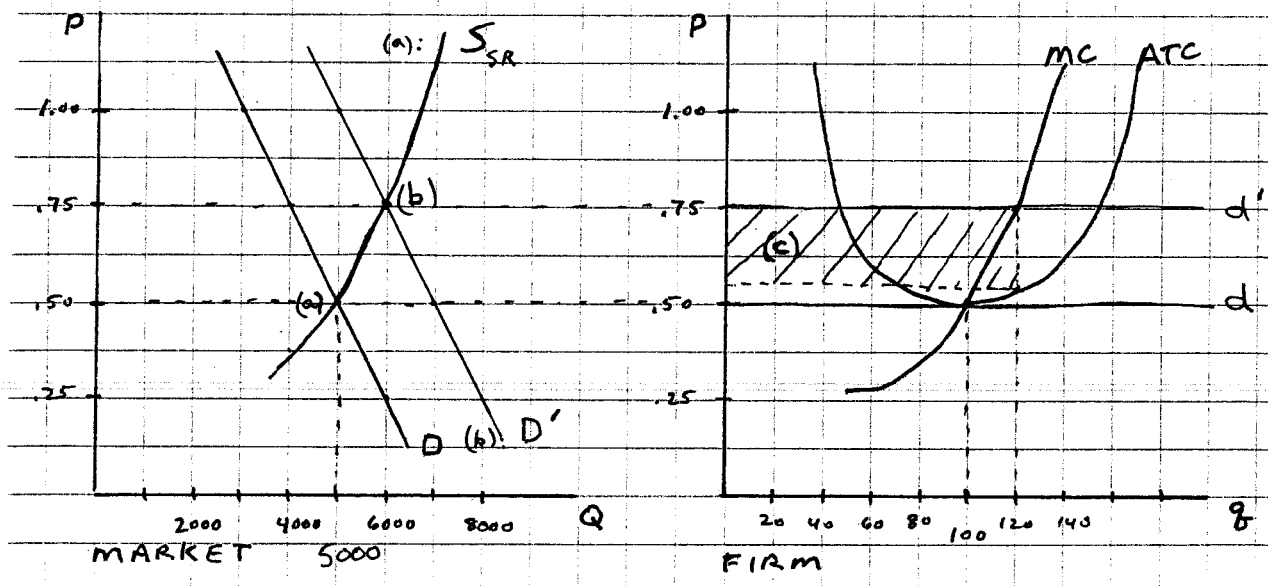
(b) Demand shifts right by 2000 to D'. Price will rise to $0.75 and q^* will increase to 120 for the typical firm. At $P = \$.75$ firms will earn positive economic profits, which will attract entry, causing S to shift right and price to fall. LR equilibrium $\Rightarrow$ $P = \$.50$ and $n = \dfrac{7000}{100} = 70$ cabs

(c) Profits [c] can be earned year after year. Selling price of a medallion will be the present discounted value of the stream of future profits resulting from barriers to entry.

12. (20 pts.) Your sister-in-law gets elected mayor. As a reward for your hard work in her election campaign, she awards you the exclusive right to sell cable TV service within city limits. Market demand for cable TV is given by P = 100 – Q/20, where P represents the monthly cable fee and Q represents the number of customers who subscribe. The costs of operating a cable TV system consist primarily of programming costs. For simplicity assume that these are constant at $20 per customer per month.

   a) What price should you set and how many customers will you have if you maximize profits? What will your monthly profits be? Illustrate in the attached diagram.

   b) Suppose you have a falling out with your sister-in-law and decide to run for mayor against her. An obvious campaign issue for you is the inefficiency associated with her policy of monopoly supply of cable TV. Using your diagram, can you explain in a way that an educated voter could understand? And remember that voters like it if you can quantify the benefits to them.
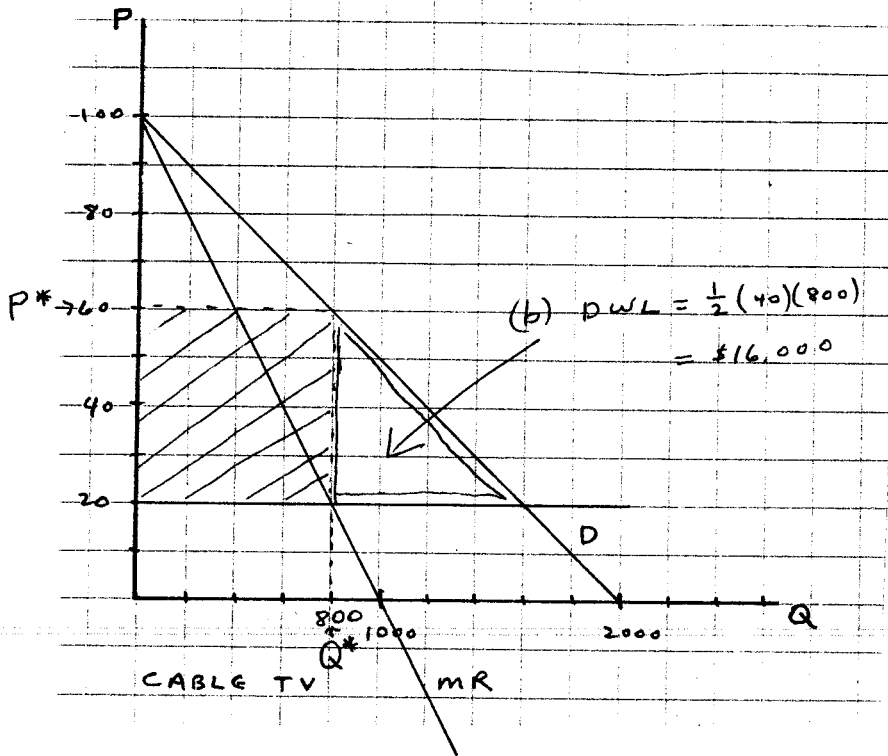
(a) $P = 100 - \frac{Q}{20}$

if $P = 0$, $Q = 2000$

if $P = 100$, $Q = 0$

$TR = P \cdot Q$

$TR = \left[100 - \frac{1}{20} Q\right] Q$

$TR = 100 Q - \frac{1}{20} Q^2$

$MR = \frac{d\,TR}{d\,Q}$

$MR = 100 - \frac{1}{10} Q$

set $MR = MC$ for max Π

$100 - \frac{1}{10} Q = 20$

$80 = \frac{1}{10} Q$

$Q^* = 800$

$P^* = 100 - \frac{800}{20} = \$60$

$\Pi = TR - TC$

$\Pi = (60)(800) - (20)(800)$

$\Pi = \$32,000$

(b) DWL $= \frac{1}{2}(40)(800)$
$= \$16,000$

(b) Cable monopoly transfers $32,000 per month out of the pockets of cable consumers into the bank account of the monopoly owner. It also results in a deadweight loss of $16,000 per month — consumer's surplus that consumers would get if P = mc but that the monopolist does not get when it restricts output by charging a higher price.