

YOUR NAME:

Thursday, February 25, 2000

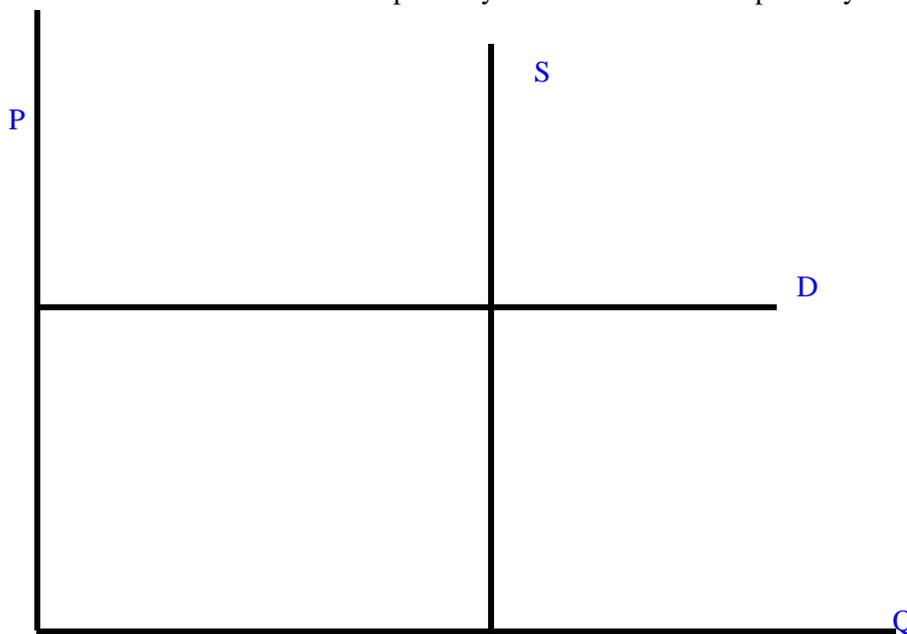
YOUR NUMBER:

First Exam Economics 304K

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Instructions: You will have 75 minutes for the exam. Do not cheat. Raise your hand if you have a question, but continue to work on the exam while waiting for your question to be answered. Allocate your time like an economist would - do the easy/valuable questions first. Short answer questions should not require more than two lines. Question values are in parentheses. Use the back of the page as scratch paper.

(5 pt.) 1. Draw and label a market with a perfectly elastic demand and a perfectly inelastic supply.



(5 pt) 2. (Short answer, no graph) What is consumer surplus?

Consumer surplus is the gains from trade for buyers or consumers.

(5 pt) 3. (Short answer) What is an inferior good, as economists use the term? Provide an example.

The demand for inferior goods rises as income falls, and falls as income rises. Common examples include sonic-burger, turnips, and Yugo automobiles.

(5 pt) 4. (Short answer) Provide two examples of by-products of the production of goods. What does the increase in price of a by-product do to the other good's supply? Why?

Beef and hides, gold and silver, silver and copper, lumber and wood chips, oil & natural gas

An increase in the price of the byproduct increases the other good's supply because producing the pair of goods becomes more profitable.

(5 pt) 5. Suppose the elasticity of demand is 2, and the price rises by 10%. By what percentage does revenue change?

The price rises to 110% of its former level and the quantity falls by 20%, to 80% of its former level. The revenue changes to $1.1p \times 0.8q = .88pq$, or 88% of its former level, a 12% drop.

Alternate answer, also correct: $\% \Delta TR = (1 - \eta) \% \Delta P = -10\%$. (The difference is the base for percent changes).

(5 pt) 6. If a and b are substitutes in production and the price of a falls, the supply of b will

- a. increase, and thus the price of b will increase.
- b. increase, and thus the price of b will decrease.
- c. decrease, and thus the price of b will decrease.
- d. decrease, and thus the price of b will increase.

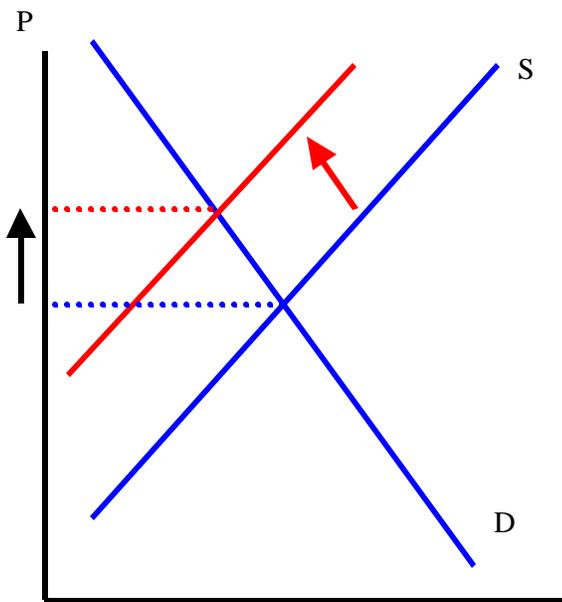
The good a becomes less profitable, causing suppliers to substitute to b , increasing the supply of b and therefore lowering its price.

(10 pt) 7. Bowties and neckties are substitutes in demand.

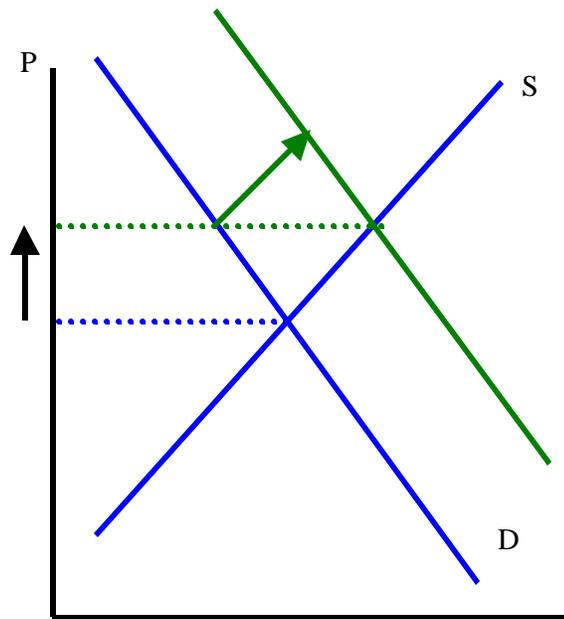
(i) (Short Answer) If the supply for bowties falls, but the supply for neckties is unchanged, what will happen to the prices of bowties and neckties?

The reduced supply of bowties causes the price to increase, creating some substitution by consumers, increasing the demand for neckties, which increases the price of neckties. Thus, both prices rise.

(ii) Illustrate your answer with supply and demand diagrams:



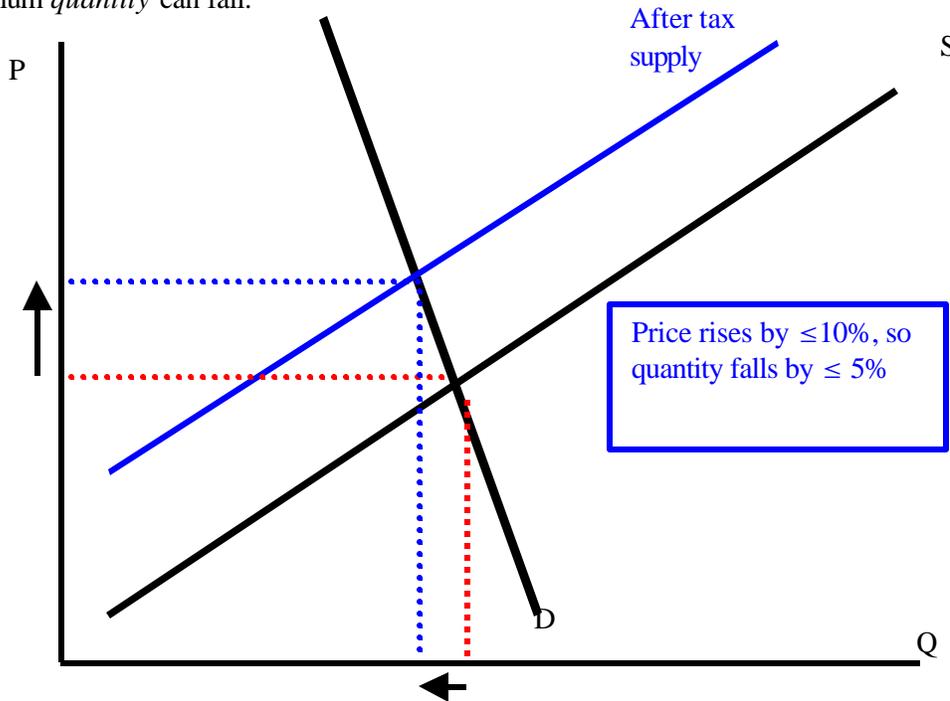
Bowtie Market



Necktie Market

(10 pt) 8. Suppose that the elasticity of demand for cigarettes is 0.5. The government adds a 10% tax, imposed on sellers, to the price.

(i) Using one diagram, illustrate the effect of the tax, and find the maximum percentage that the equilibrium *quantity* can fall.



(ii) Now assume, in addition, that the supply elasticity is $2.5 = 5/2$. By how much does the equilibrium quantity fall? No diagram is necessary.

The demand price rises by twice $-\% \Delta Q$. The supply price rises by $\% \Delta Q / \epsilon = \% \Delta Q \times 2/5$. Thus,

$10\% = - \% \Delta Q (2 + 2/5) = - \% \Delta Q (12/5)$. Thus, $\% \Delta Q = 24/10 = 2.4\%$

(10 pt) 9. Consider the controlled substances experiment 4.

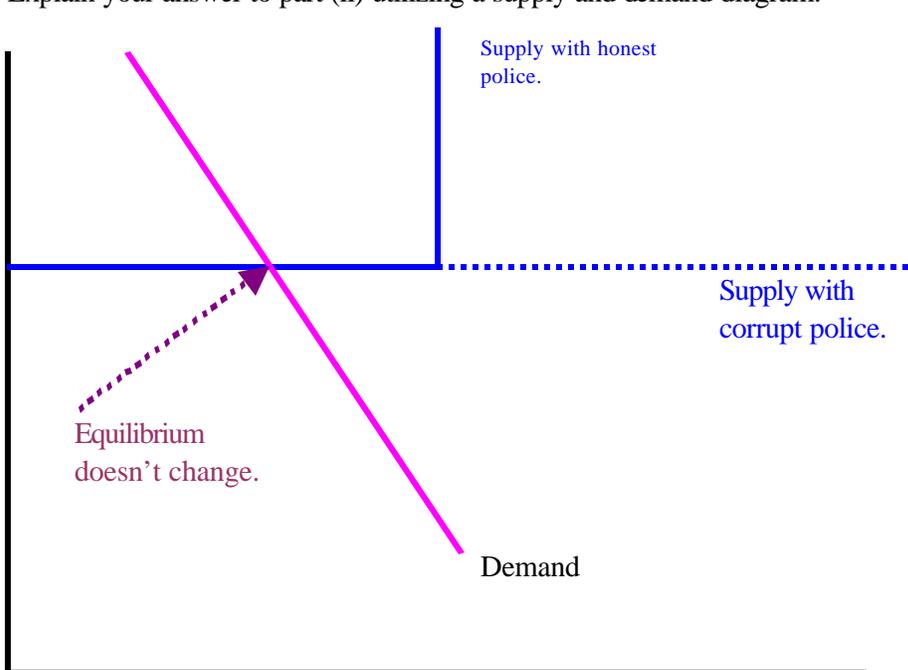
(i) In 4.3, police confiscated half the units. What were seller costs for each unit the sellers sold? (That is, at what price would sellers break even?)

*25. For each unit sold, the seller had to produce two units at a cost of *20, and also pay a *5 fine.

(ii) In experiment 4.4, the police resold confiscated units. What does this resale do to the predicted price?

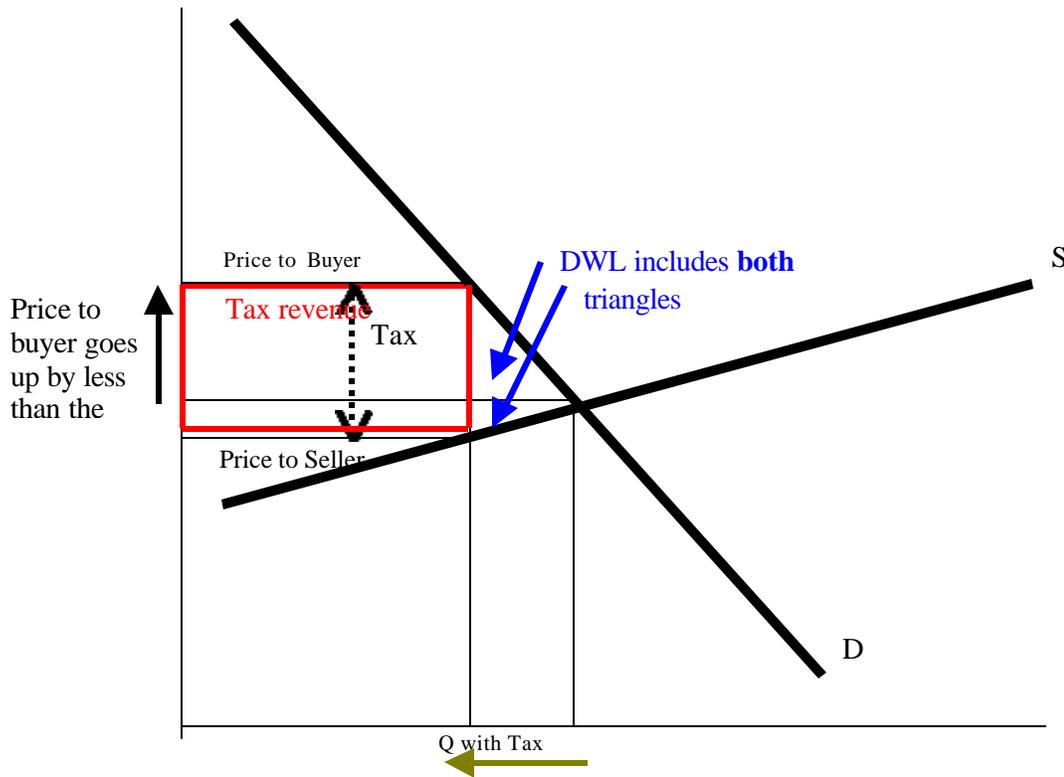
Nothing. Sellers still experienced the same cost at the equilibrium price.

(iii) Explain your answer to part (ii) utilizing a supply and demand diagram.



(10 pt) 10. Consider the sales tax like that imposed in experiment 3.

(i) Using the supply and demand diagram below, show how the tax on suppliers reduces quantity, raises the price paid by consumers by an amount less than the tax, and lowers the price paid to suppliers. On the same diagram, illustrate the dead weight loss, and outline the area corresponding to the total tax revenue collected.



(ii) (Short answer) Did it matter, in Experiment 3, who paid the tax? Why or why not?

This answer varies with group; in most groups, the quantity rose slightly in the last experiment, when the buyer paid the tax. Your answer should reflect what happened in your group.

(10 pt) 11. Consider experiment 2, where the fishers sometimes caught one or two fish.

(i) Explain how an increase in the number of fish caught can reduce the total earnings of fishers.

An increase in the quantity causes the price to fall; when demand is inelastic, the price falls by a larger percentage than the quantity and the total revenue, which is the earnings by fishers, falls.

(ii) Fishers paid ★10 to run their boats. If prices fall to ★1, these fishers lose money. How many would you expect them to exit the industry? (Hint: What should happen to prices?)

There would be enough exiting to bring the price back up to a level in which the fishers make enough money to stay in the industry, and in particular cover their costs. This might require all the fishers to exit.

(20 pt) 12. Consider a competitive market with 9 consumers, each of whom will buy at most one unit of the good, and 8 sellers, each of whom will sell at most one unit of the good. The distribution of buyer values (or buyer reservation prices) is as follows:

Buyer Value	Number of Buyers
\$4	4
\$8	2
\$12	3

The distribution of seller costs (or seller reservation prices) is as follows:

Seller Cost	Number of Sellers
\$2	6
\$6	2

12 (i). In this market, what price (P) and quantity (Q) would arise in a competitive equilibrium?

Equilibrium price is \$4, with 6 units sold.

12(ii) What are the equilibrium price and quantity if sellers are required to pay a tax of \$8 for each unit of the good sold?

The quantity falls to 3, and the price rises to \$10.

12(iii). How much tax revenue is raised by this \$8 per unit tax paid by sellers?

\$24

12(iv). What is the excess burden or dead weight loss of this \$8 per unit tax paid by sellers?

\$14 – two transactions worth \$6 each and one worth \$2.

12 (v). What are the equilibrium price and quantity if buyers, instead of sellers, are required to pay the tax of \$8 for each unit of the good sold?

The price is now \$2 – \$10 - \$8 in tax – and the quantity is the same at 3.

12 (vi) What is the excess burden or dead weight loss if buyers, instead of sellers, are required to pay the tax of \$8 for each unit of the good sold?

It's the same, at \$14.

(12) (vii) Draw the supply and demand diagram for this market, and illustrate the effect of a tax imposed on the buyers.

