

Microeconomics, consumers' and producers' surplus, final exam practice problems

(The attached PDF file has better formatting.)

\*Question 1.1: Producers' Surplus vs Consumers' Surplus

The equilibrium price and quantity are  $P = 25$  and  $Q = 100$ . The demand curve is  $P = \alpha - \beta Q$  and the supply curve is  $P = \alpha' + \beta'Q$ . In which scenario is producers' surplus most likely greater than consumers' surplus?

- A. The supply curve is highly inelastic; the demand curve is highly elastic.
- B. The supply curve is highly elastic; the demand curve is highly inelastic.
- C. Both the supply and demand curves are high inelastic.
- D. Both the supply and demand curves are high elastic.
- E. Producers' surplus is never greater than consumers' surplus.

Answer 1.1: A

An inelastic curve is steep, with a high value of  $\beta$ ; an elastic curve is flat, with a low value of  $\beta$ .

Elastic curves have little surplus; inelastic curves have high surplus. The more *inelastic* the curve, the greater is the social gain from producing more of the product.

Know the relations among the slopes of the supply and demand curves, consumers' surplus, and producers' surplus. It is easy to confuse these relations.

*Jacob:* If demand is inelastic, consumers are willing to buy the same quantity for a higher price, and suppliers may take advantage of them. As an example, consumers with less elastic demand pay higher prices in third degree price discrimination.

*Rachel:* This is correct; if the supplier is a monopolist, consumers with less elastic demand pay higher prices. But it is not correct to reason that because the consumers with less elastic demand pay higher prices they have less consumers' surplus. Since they are *willing to pay very high prices*, their consumers' surplus is great.

\*Question 1.2: Consumers' Tastes

The equilibrium price and quantity are  $P_0$  and  $Q_0$ . Consumers' tastes change, and the demand curve becomes more elastic, but the equilibrium price and quantity are still  $P_0$  and  $Q_0$ . Which of the following is true?

- A. Consumers' surplus decreases.

- B. Consumers' surplus increases.
- C. Producers' surplus decreases.
- D. Producers' surplus increases.
- E. None of A, B, C, or D is true.

Answer 1.2: A

Consumers' surplus is the area of the triangle with base Q (which has not changed) and height being the maximum a consumer would pay for the good minus the price (which has not changed). Since the demand curve is now more elastic, and the point  $(P_0, Q_0)$  has not changed, the maximum price for the first good consumed is *lower*.

\*Exercise 1.3: Sales Tax and Dead Weight Loss

The table below shows the equilibrium quantity, consumers' surplus, and producers' surplus in a *competitive* industry before and after a sales tax of \$2 a unit. What is the dead weight loss from the sales tax?

	<i>Before Tax</i>	<i>After Tax</i>
<i>Quantity</i>	200	100
<i>Consumers' Surplus</i>	1500	1200
<i>Producers' Surplus</i>	1500	1200
<i>Tax Revenue</i>	0	200

- A. 200
- B. 300
- C. 400
- D. 500
- E. 600

Answer 1.3: C

The reduction in consumers' plus producers' surplus is  $(1,500 + 1,500) - (1,200 + 1,200) = 600$ . The tax revenue is  $100 \times 2 = 200$ . The dead weight loss is  $600 - 200 = 400$ .

Do not forget the tax revenue. In a competitive market, social welfare is consumers' surplus plus producers' surplus. If the government imposes taxes, subsidies, or other impediments, we add the tax revenue or subtract the subsidy.