# Econ 2016: Principles of Microeconomics

Homework 5 (Total score: 20 Points)

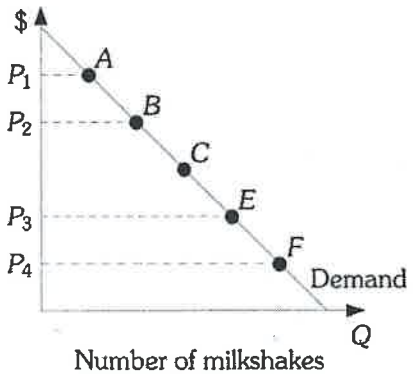
Due Date: Sept 26th, 12:40 PM

**1. Multiple Choice (9 points)**

C 1. (1 point) When the price of tea decreases 7%, quantity demanded increases 12%. The price elasticity of demand for tea is _____ and total revenue from tea sales will _____.
A. inelastic; increase B. inelastic; decrease C. elastic; increase D. elastic; decrease

A 2. (1 point) Refer to the Figure 1. The demand for milkshakes is unit elastic at Point C. If the milkshake price falls from $P_1$ to $P_2$, total revenue will
A. increase B. decrease C. remain constant D. either increase or decrease

Figure 1: Question 1.2-1.3




P ↑ 7%
Qd ↓ 12%
$\varepsilon = \frac{\%\Delta Q}{\%\Delta P} = \frac{12\%}{7\%} > 1$
⇒ elastic.
since $|\%\Delta Q| > |\%\Delta P|$
By TR = P × Q
if the firm decreases P.
then Qd decreases more.
TR will ↑ increase

B 3. (1 point) Refer to Figure 1. Along the given demand curve, which of the following is true?
A. Demand is less elastic along the segment AB than the segment EF.
B. Demand is less elastic along the segment EF than the segment AB.
C. Since the demand curve is linear, the price elasticity of demand between each of the points is the same.
D. All of the above are true.

B 4. (1 point) When the slope of a demand curve is constant, price elasticity of demand is constant as well.
A. True B. False

C 5. (1 point) Refer to Figure 2. The amount of the tax is _____ per pumpkin.
A. $1.25 B. $1.75 C. $3.00 D. $7.25

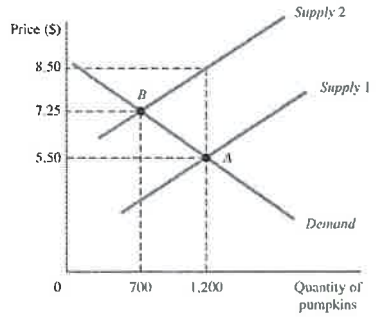
B 6. (1 point) Refer to Figure 2. The amount by which the store owners will raise the price of pumpkins after the imposition of the tax is _____ per pumpkin.
A. $1.25 B. $1.75 C. $3.00 D. $7.25

C 7. (1 point) Refer to Figure 2. The amount the store owners will receive per pumpkin after paying the tax is
A. $1.75 B. $3.00 C. $4.25 D. $7.25

D 8. (1 point) Refer to Figure 2. The amount customers will pay per pumpkin after the imposition of the tax is
A. $1.75 B. $3.00 C. $4.25 D. $7.25

C 9. (1 point) Refer to Figure 2. The total revenue the government will receive from the imposition of this tax is
A. $875 B. $1225 C. $2100 D. $3600

Figure 2: Question 1.5-1.9




**2. Short Answer Questions (8 points):** The quantity of apples demanded increases from 8 pounds to 10 pounds when the price of apples decreases from \$5 per pound to \$2 per pound.

1. Please use the midpoint method to calculate the price elasticity of demand for apples. (keep 2 decimals)
**Answer:**

$Q_1 = 8 \quad Q_2 = 10 \quad \bar{Q} = \frac{Q_1+Q_2}{2} = \frac{8+10}{2} = 9$

$P_1 = \$5 \quad P_2 = \$2 \quad \bar{P} = \frac{P_1+P_2}{2} = \frac{2+5}{2} = 3.5$

$$\varepsilon = \frac{\%\Delta Q}{\%\Delta P} = \frac{\frac{Q_1-\bar{Q}}{\bar{Q}}}{\frac{P_1-\bar{P}}{\bar{P}}} = \frac{\frac{8-9}{9}}{\frac{5-3.5}{3.5}} = -\frac{1}{9} \times \frac{35}{15} = -\frac{7}{21}$$

2. If you were a farmer who would like to supply apples, and you realize that consumers have *elastic* demands for apples in general, to maximize your total revenue, will you increase the unit price for the apples? Why or why not?
**Answer:** This question is not related to the above question.

Since demand is elastic $\Rightarrow |\varepsilon| > 1 \Rightarrow \left|\frac{\%\Delta Q}{\%\Delta P}\right| > 1$

$\Rightarrow |\%\Delta Q| > |\%\Delta P| \Rightarrow$ By $TR = P \times Q$ (small, large) $\Rightarrow$ the firm should decrease the price.

**3. Short Answer Question (3 points):** In class, we have shown that there is no dominant strategy for a bidder in the First-Price auction. Should a bidder bid ($b_i$) lower than his true value ($v_i$) for the prize? Or higher than his true value? Or equal to his true value? Why?

Consumer (bidder i) tries to maximize his consumer surplus.
His willingness to pay for the prize (true value) is $v_i$,
and his consumer surplus = $v_i - b_i$.
(WTP) (real payment)
To make sure his consumer surplus be positive, he should choose a bid ($b_i$) such as: $v_i > b_i$. Meanwhile, the bidder tries to win the auction, so he needs to make his bid $b_i$ being higher than other bidders' bids.