

AP[®] MICROECONOMICS
2015 SCORING GUIDELINES

Question 3

6 points (1+1+1+1+2)

(a) 1 point:

- One point is earned for calculating the total producer surplus as $(1/2 \times 20 \times 20) = \200 .

(b) 1 point:

- One point is earned for stating that imposing a price floor at \$16 is ineffective and will not create a surplus or a shortage in the market because it is set below the equilibrium price, or because it is not binding.

(c) 1 point:

- One point is earned for stating that imposing a price ceiling at \$12 will create a shortage because quantity demanded is greater than quantity supplied, or because the price ceiling is binding.

(d) 1 point:

- One point is earned for calculating the deadweight loss as \$150 and for showing:

$$(1/2 \times 30 \times 10)$$

or

$$(1/2 \times 10 \times 10) + (1/2 \times 20 \times 10)$$

or

$$\$50 + \$100$$

(e) 2 points:

- One point is earned for calculating the price elasticity of demand as $[(24-20)/20 / (12-20)/20] = -0.5$, or for correctly using the midpoint formula.
- One point is earned for stating that in this price range the demand is relatively inelastic.

$$a) \quad (20 \times 20) / 2 = \frac{400}{2} = \$200$$

(b) Neither, because a price floor needs to be ~~at~~ above equilibrium price in order to be binding. In this case, equilibrium price is \$20. Market forces such as competition and self interest will pull the ~~equilibrium~~ price back to equilibrium, where $Q_s = Q_d$ ($20 = 20$)

(c) Shortage, because the price ceiling will be binding since it's below equilibrium. ~~The~~ At a price of \$12, $Q_d > Q_s$. ~~Low~~ Consumers demand 24 units but suppliers will only supply 12 units at that price. ($24 > 12$). Therefore, there would be a shortage of $24 - 12$, or 12, units.

$$d) \quad \frac{(40 - 20)(20 - 10)}{2} + \frac{(20 - 10)(20 - 10)}{2}$$

$$\frac{20(10)}{2} + \frac{(10)(10)}{2}$$

$$\frac{200}{2} + \frac{100}{2}$$

$$100 + 50 = \$150$$

$$e) (i) \quad \left| \frac{\% \Delta Q_d}{\% \Delta P} \right| = \left| \frac{\frac{24 - 20}{20}}{\frac{12 - 20}{20}} \right| = \left| \frac{\frac{4}{20}}{\frac{-8}{20}} \right| = \frac{4}{20} \times \frac{20}{8} = \left(\frac{1}{2} \right)$$

(ii) Demand is relatively inelastic because price elasticity < 1

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- a) Assuming the demand curve continues leftward beyond this graph's limits... The producer surplus would be 200.

$$20 \times 20 = 400 \cdot \frac{1}{2} = 200$$
- b) There would be a shortage. Quantity demanded (22) would be greater than quantity supplied (16).
- c) Again there would be a shortage. Quantity demanded (24) would be greater than quantity supplied (12).
- d) The deadweight loss would be 150. $30 \times 10 = 300 \cdot \frac{1}{2} = 150$
- e) i) $20 - 12 = 8$ $24 - 20 = 4$ $\frac{4}{8} = \frac{1}{2}$ Price elasticity of demand
- ii) In this price range, demand is relatively elastic.

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$$a. \frac{20 \times 20}{2} = 200$$

producer surplus is 200 dollars

b. there is a shortage because now the market needs to run below equilibrium price

c. there is a surplus because firms cannot charge below 12 dollars so competition changes causing a surplus.

$$d. \frac{10 \times 10}{2} = 50$$

deadweight loss is 50 dollars.

e.i. \$8 4 units

$$4/8 = .5$$

price elasticity of demand is .5

ii the demand is relatively elastic

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AP[®] MICROECONOMICS

2015 SCORING COMMENTARY

Question 3

Overview

The question assessed students' ability to analyze a given supply and demand graph in a competitive market when the market is in and out of equilibrium. Students were asked to calculate the area of producer surplus when the market is in equilibrium. Although students did not have to identify the equilibrium price and quantity for the market, correctly identifying the equilibrium price and quantity was required in order to calculate the producer surplus. Students were given a price floor set below the equilibrium price and were asked to explain why this price floor will not create a shortage or surplus. Students were then given a price ceiling set below the equilibrium price and were asked to explain whether this creates a shortage or a surplus and why. Students were then given a quantity produced to calculate the deadweight loss caused by an output quota. Finally, students were asked to calculate the price elasticity of demand over a specific range and then to interpret their calculation to determine if demand is relatively elastic or inelastic.

Sample: 3A

Score: 6

The student answered all parts of the question correctly and earned all 6 points.

Sample: 3B

Score: 3

The student did not earn 1 point in part (b) for incorrectly stating that the price floor will create a shortage. The student did not earn 1 point in part (e)(i) for incorrectly calculating the price elasticity of demand. The student did not earn 1 point in part (e)(ii) for incorrectly stating that the demand curve is relatively elastic in the given price range.

Sample: 3C

Score: 1

The student earned 1 point in part (a) for correctly calculating the producer surplus.