

FREE SAMPLE: THE FIRST QUESTION

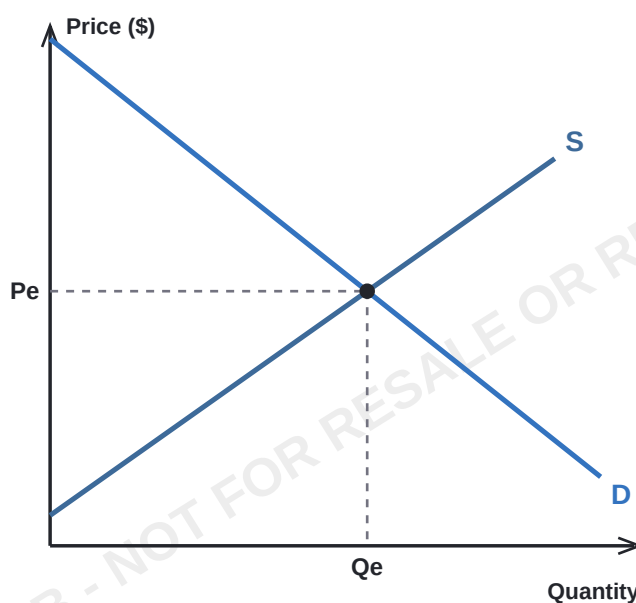
Question One (15 marks)

(a) The market for blueberries is in equilibrium. Demand and supply are shown in the table and Graph One. Surpluses are measured in \$ thousand.

Calculate the equilibrium price and quantity, the consumer surplus and the producer surplus, and the total surplus.

Curve	Equation (P in \$, Q in thousand units)
Demand	$P = 78 - 2Q$
Supply	$P = 22 + 2Q$

[4 marks]



Graph One: The market for blueberries

(b) A licensing rule limits sales of blueberries to 10 thousand, which is 4 thousand less than the equilibrium quantity.

Calculate the total surplus at 10 thousand and the deadweight loss. Explain, using the idea of allocative efficiency, why the market is efficient at Q_e but not at 10 thousand.

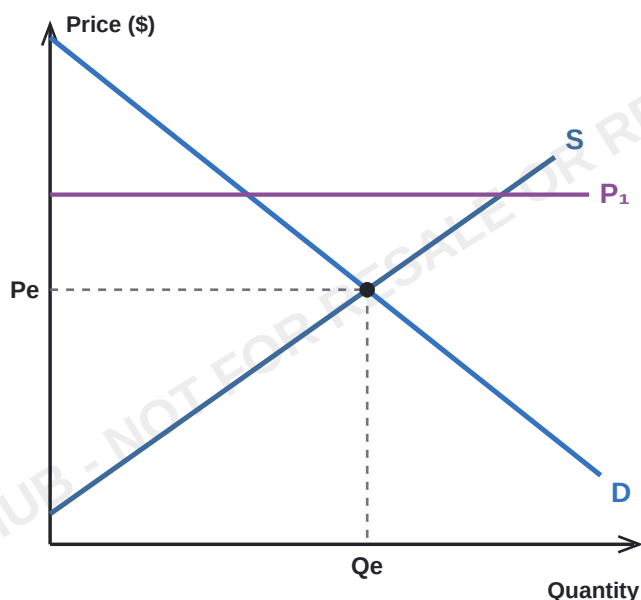
[5 marks]

(c) The price of ski lift passes is set at P_1 , shown on Graph Two, by a pricing rule that applies for one week.

On Graph Two, use dotted lines to show the resulting surplus at P_1 . Label the surplus and the quantities demanded (Q_d) and supplied (Q_s).

Curve	Equation (P in \$, Q in thousand units)
Demand	$P = 62 - Q$
Supply	$P = 26 + Q$
Price P_1	\$45

[2 marks]



Graph Two: The market for ski lift passes

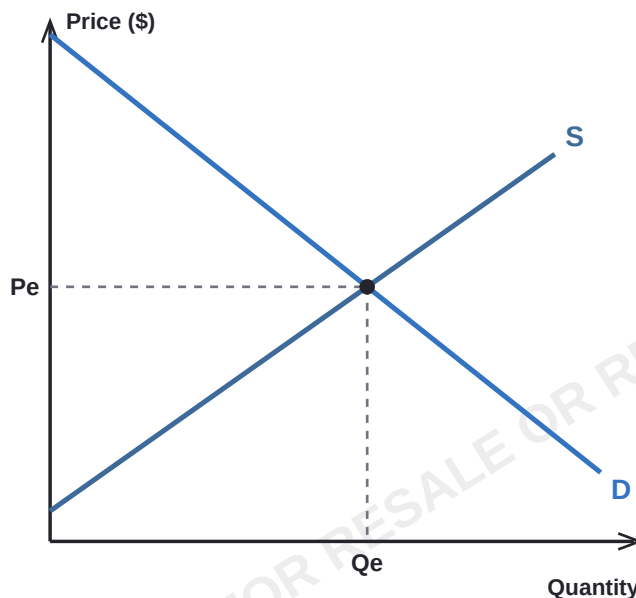
(d) Explain how the market would restore equilibrium from P_1 if the price were free to change. Refer to the labels on Graph Two, including P_e , Q_e , Q_d and Q_s .

[4 marks]

THE WORKED ANSWER TO THAT QUESTION

Question 1 (15 marks) [Market equilibrium and efficiency]

(a) The market for blueberries is in equilibrium. Demand and supply are shown in the table and Graph One. Surpluses are measured in \$ thousand. Calculate the equilibrium price and quantity, the consumer surplus and the producer surplus, and the total surplus.



Graph One: The market for blueberries

(a) Answer: $Q_e = 14$ thousand, $P_e = \$50$; CS = \$196 thousand, PS = \$196 thousand, total = \$392 thousand

- Evidence level: Merit (solves for equilibrium and finds both surpluses as triangles).
- Set demand equal to supply: $78 - 2Q = 22 + 2Q$, so $4Q = 56$ and $Q = 14$ thousand.
- $P = 78 - 2 \times 14 = \$50$.
- Consumer surplus = $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 14 \times (78 - 50) = \196 thousand.
- Producer surplus = $\frac{1}{2} \times 14 \times (50 - 22) = \196 thousand.
- Total surplus = $196 + 196 = \$392$ thousand.

KEY TAKEAWAY

Consumer surplus is the triangle between the demand curve and the price; producer surplus is the triangle between the price and the supply curve; their sum is total surplus.

(b) A licensing rule limits sales of blueberries to 10 thousand, which is 4 thousand less than the equilibrium quantity. Calculate the total surplus at 10 thousand and the deadweight loss. Explain, using the idea of allocative efficiency, why the market is efficient at Q_e but not at 10 thousand.

(b) Answer: Total surplus \$360 thousand; deadweight loss \$32 thousand

- Evidence level: Excellence (calculates the loss and links marginal benefit and marginal cost to allocative efficiency).
- Achievement: Total surplus is \$360 thousand, so the deadweight loss is \$32 thousand; allocative

efficiency is where total surplus is greatest, at Q_e .

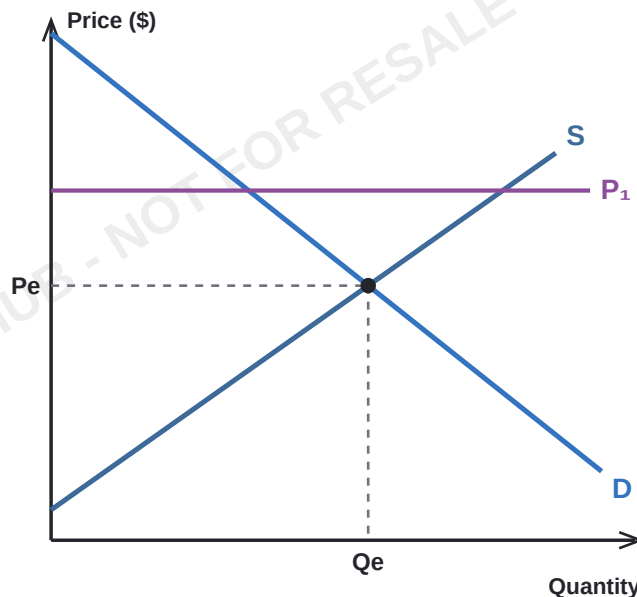
- Merit: At 10 thousand units, the value to buyers is shown by demand at $P = 78 - 2 \times 10 = \$58$ and the cost to sellers by supply at $P = 22 + 2 \times 10 = \$42$. Total surplus = $(78 - 22) \times 10 - \frac{1}{2} \times 4 \times 10^2 = \360 thousand, which is \$32 thousand below the maximum of \$392 thousand.

- Excellence: At 10 thousand units, the value to buyers is shown by demand at $P = 78 - 2 \times 10 = \$58$ and the cost to sellers by supply at $P = 22 + 2 \times 10 = \$42$. Total surplus = $(78 - 22) \times 10 - \frac{1}{2} \times 4 \times 10^2 = \360 thousand, which is \$32 thousand below the maximum of \$392 thousand. Deadweight loss = $\frac{1}{2} \times (58 - 42) \times 4 = \32 thousand. Every unit between 10 and 14 thousand is valued by buyers by more than it costs sellers to produce (marginal benefit > marginal cost), so trades that would make both sides better off do not happen. At Q_e , marginal benefit equals marginal cost, there are no such trades left, and total surplus (consumer plus producer surplus) is as large as it can be: the market is allocatively efficient. Below Q_e the deadweight loss shows that resources are not used to produce the most valuable combination of goods.

KEY TAKEAWAY

Allocative efficiency means total surplus is as large as it can be, which happens where marginal benefit equals marginal cost; any other quantity leaves a deadweight loss.

(c) The price of ski lift passes is set at P_1 , shown on Graph Two, by a pricing rule that applies for one week. On Graph Two, use dotted lines to show the resulting surplus at P_1 . Label the surplus and the quantities demanded (Q_d) and supplied (Q_s).



Graph Two: The market for ski lift passes

(c) Answer: At P_1 $Q_d = 17$ thousand and $Q_s = 19$ thousand: a surplus of 2 thousand

- Evidence level: Achieved (draws and labels the dotted lines from P_1 to the curves).
- Draw a horizontal line at P_1 and mark where it meets the demand curve (Q_d) and the supply curve (Q_s).
- Drop dotted lines from those points to the quantity axis and label them Q_d and Q_s .
- At P_1 , price is above P_e is too high, so Q_d is less than Q_s . The distance between Q_s and Q_d is the surplus (excess supply).

KEY TAKEAWAY

At a price below equilibrium buyers want more than sellers supply (a shortage); above equilibrium sellers supply more than buyers want (a surplus).

(d) Explain how the market would restore equilibrium from P_1 if the price were free to change. Refer to the labels on Graph Two, including P_e , Q_e , Q_d and Q_s .

(d) Answer: Price falls to P_e ; Q_d and Q_s both move to $Q_e = 18$ thousand

- Evidence level: Excellence (explains the movement along both curves using the labels).
- Achievement: A surplus pushes the price down from P_1 towards P_e . As the price falls, quantity supplied falls and quantity demanded rises until they are equal at Q_e .
- Merit: At P_1 sellers offer 19 thousand but buyers want only 17 thousand, a surplus of 2 thousand. Sellers compete for the limited demand and cut the price. As the price falls, buyers buy more (a movement down along D from Q_d towards Q_e) and producers supply less (a movement down along S from Q_s towards Q_e).
- Excellence: At P_1 sellers offer 19 thousand but buyers want only 17 thousand, a surplus of 2 thousand. Sellers compete for the limited demand and cut the price. As the price falls, buyers buy more (a movement down along D from Q_d towards Q_e) and producers supply less (a movement down along S from Q_s towards Q_e). The surplus shrinks with each price cut and disappears when the price reaches $P_e = \$44$, where $Q_d = Q_s = Q_e = 18$ thousand. At P_e the market clears, so there is no pressure for the price to change. Demand and supply have not shifted: only the price and the quantities moved, along the curves.

KEY TAKEAWAY

Market forces restore equilibrium by price changes: competition among buyers (shortage) or sellers (surplus) moves the price until quantity demanded equals quantity supplied.

LOS: Market equilibrium and efficiency (91399)

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