

Price determination

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Read first: [Demand](#), [Supply](#)

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What you need to know

By the end of this topic you should be able to:

1. **Define market equilibrium:** the price at which the quantity demanded equals the quantity supplied, so the market clears. Use demand and supply **schedules** (tables) and **curves** to find the **equilibrium price** and the **equilibrium quantity** (the sales in the market), and draw and read them on a diagram.
2. **Define market disequilibrium:** any price at which the quantity demanded and the quantity supplied are **not** equal. Use schedules and curves to spot a disequilibrium price and to show and measure:
 - a **shortage** (excess demand): quantity demanded is greater than quantity supplied, at a price **below** equilibrium;
 - a **surplus** (excess supply): quantity supplied is greater than quantity demanded, at a price **above** equilibrium.

The whole topic is the same for every candidate (0455 has no Core/Extended split). The causes and effects of price changes, and price elasticity, are the next topics; this note only uses shifts to show how a disequilibrium arises.

Understand it

Two plans meet

Buyers and sellers make separate plans. The **demand** schedule says how much consumers are willing and able to buy at each price; the **supply** schedule says how much producers are willing and able to sell. Nobody co-ordinates them, yet at one price the two plans agree. That price is found by the market itself.

Suppose these are the weekly plans for mangoes in a town:

Price per box	Quantity demanded (boxes)	Quantity supplied (boxes)	Result
\$1	100	20	shortage of 80
\$2	80	40	shortage of 40
\$3	60	60	equilibrium

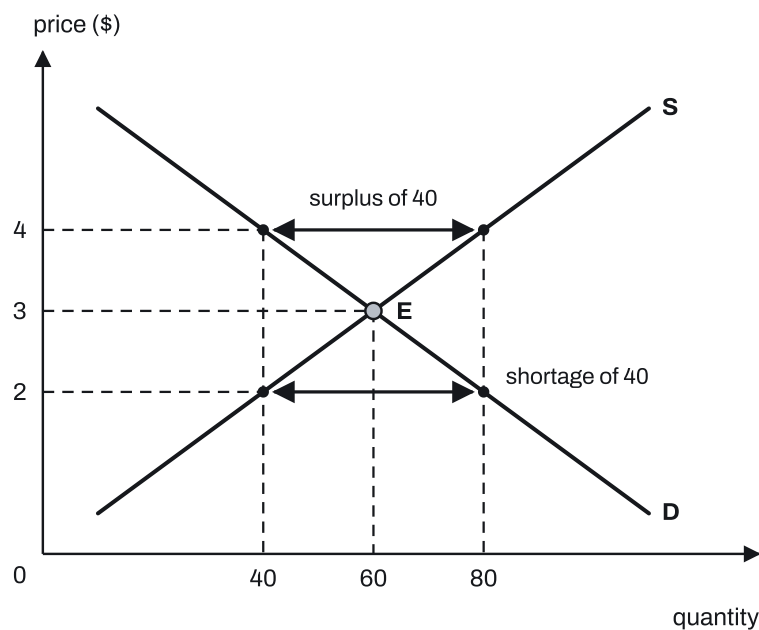
Price per box	Quantity demanded (boxes)	Quantity supplied (boxes)	Result
\$4	40	80	surplus of 40
\$5	20	100	surplus of 80

Market equilibrium

At \$3, buyers want 60 boxes and sellers want to sell 60 boxes. Everyone who wants to buy at that price can, and every box offered is sold: the market **clears**. This is **market equilibrium**:

- the **equilibrium price** is \$3;
- the **equilibrium quantity** (the quantity bought and sold, or "sales") is 60 boxes;
- total spending by consumers, which is also the sellers' total revenue, is price $\times$ quantity: $3 \times 60 = 180$, so \$180.

"Equilibrium" means a position of rest: once the market is there, nothing pushes the price up or down, and it stays until demand or supply changes. On a diagram the equilibrium is where the demand curve **crosses** the supply curve.



Market disequilibrium

At every other price the plans do not match. The market is in **disequilibrium**.

- **Above equilibrium, a surplus.** At \$4 sellers offer 80 boxes but buyers only want 40. There is a **surplus** (excess supply) of $80 - 40 = 40$ boxes. Sellers are left with **unsold stock**.
- **Below equilibrium, a shortage.** At \$2 buyers want 80 boxes but sellers only offer 40. There is a **shortage** (excess demand) of $80 - 40 = 40$ boxes. Some buyers go without; queues form and shelves empty.

The size of a surplus or shortage is the **horizontal gap** between the curves at that price (quantity supplied minus quantity demanded, or the other way round). It is a quantity, never a price. The further the price is from equilibrium, the bigger the gap: at \$5 the surplus is 80.

How the market gets back to equilibrium

In a free market, a disequilibrium does not last. The price does the work:

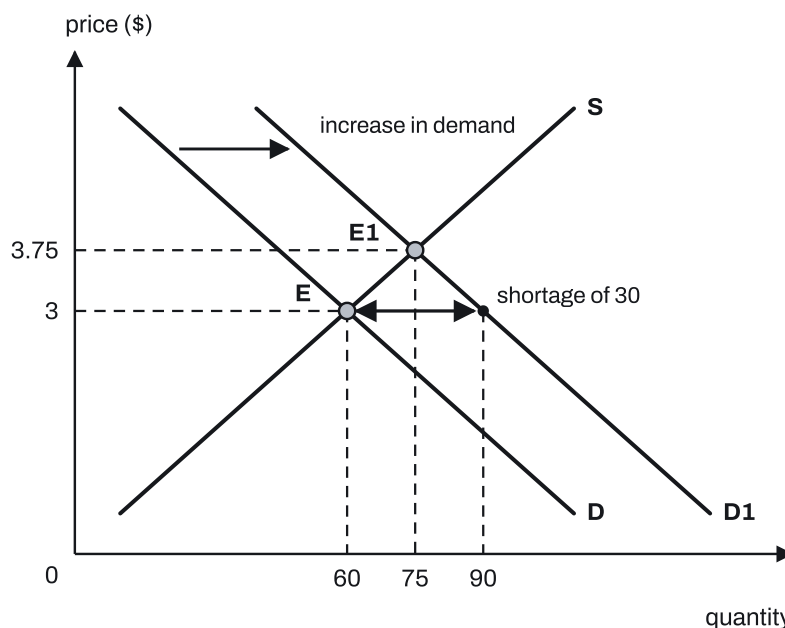
- **Surplus** → **price falls**. Sellers with unsold stock cut their prices to get rid of it. As the price falls, the quantity demanded **extends** (buyers want more) and the quantity supplied **contracts** (sellers offer less). The gap shrinks until, at \$3, the quantities are equal again.
- **Shortage** → **price rises**. Buyers compete for the scarce product and sellers see they can charge more. As the price rises, the quantity demanded **contracts** and the quantity supplied **extends**, until they meet at \$3.

These are movements **along** the curves. Neither curve shifts: a surplus is removed by a fall in price, not by a "decrease in supply".

A disequilibrium can last only while something **holds the price** away from equilibrium: sellers who refuse to change their price, a price fixed in advance, or a government maximum or minimum price. For example, a maximum price set below equilibrium keeps a shortage in place.

How a disequilibrium starts: a shift at the old price

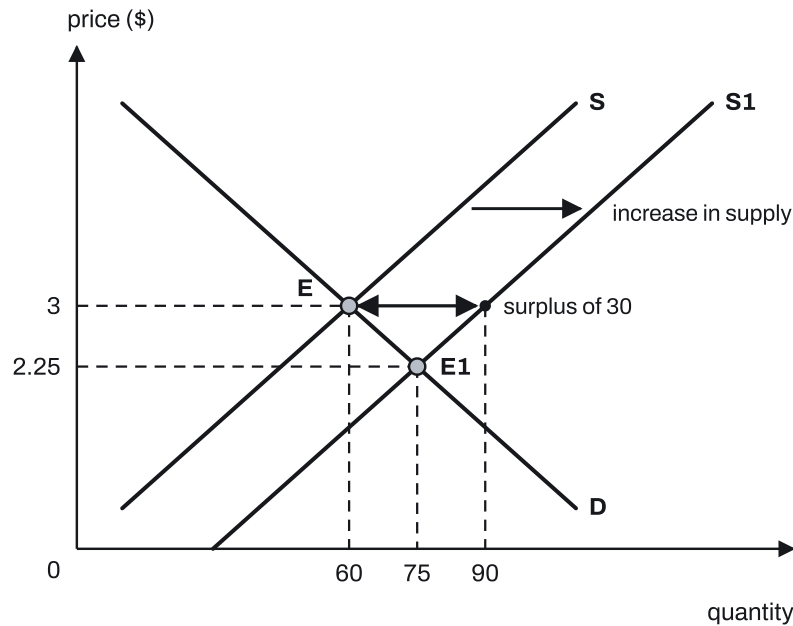
A market in equilibrium stays there until demand or supply **changes** (a shift of a curve; see the Demand and Supply notes for the causes). At the moment of the shift the price is still the old one, so a disequilibrium opens up.



- **Demand increases** (for example, a heatwave raises demand for ice cream). At the old \$3, 90 boxes are now demanded but only 60 supplied: a **shortage of 30**. The price rises. Quantity supplied extends and quantity demanded contracts until the new equilibrium, \$3.75 and 75 boxes. If sellers kept the price at \$3,

the shortage would remain.

- **Demand decreases** (for example, a health report puts people off a product). If producers keep supplying the same amount at the old price, there is a **surplus**, and the price will fall.



- **Supply increases** (a good harvest). At the old \$3, 90 boxes are supplied but only 60 demanded: a **surplus of 30**. The price falls to a new equilibrium of \$2.25 and 75 boxes.
- **Supply decreases** (bad weather destroys crops). At the old price, quantity demanded is greater than quantity supplied: a **shortage**, and the price will rise.

Rule of thumb: at the **old** price, the side that grew is now bigger than the other. More demand or less supply gives a shortage; less demand or more supply gives a surplus.

Key facts and formulas

This topic has no formula list in the exam. "Learn it" means you must remember it.

Fact	Status
Equilibrium: quantity demanded = quantity supplied; the market clears; shown where D crosses S	Learn it
Equilibrium price and equilibrium quantity (sales) are read off the crossing point, or the row of the table where the two quantities are equal	Learn it
Disequilibrium: quantity demanded $\neq$ quantity supplied	Learn it
Shortage (excess demand): $Q_d > Q_s$, price below equilibrium; size = $Q_d - Q_s$	Learn it

Fact	Status
Surplus (excess supply): $Q_s > Q_d$, price above equilibrium; size = $Q_s - Q_d$	Learn it
Shortage → price rises; surplus → price falls; both by movements along the curves	Learn it
Total spending = total revenue = price × quantity sold	Learn it
At the old price after a shift: more demand or less supply → shortage; less demand or more supply → surplus	Learn it

How to do it

In the questions we have tagged for this topic (16 questions, 2022–2025), the parts about this topic are these. Each question has one part on this topic: the 20-mark Paper 2 question has other parts on other topics.

Question type	Question parts
Multiple choice (concept)	12
Multiple choice (calculation)	3
Explain (4 marks)	1

No Define (2), Analyse (6) or Discuss (8) parts on this topic have been tagged yet; section 3 ends with plans for them, and Example 4 shows an Analyse answer.

1. Multiple choice (concept) (12 question parts)

1. **Find the equilibrium first:** the crossing point, or the table row where the two quantities are equal.
2. **Compare the price asked about with it.** Above equilibrium → surplus; below → shortage.
3. **Check the direction words.** "Excess demand" = shortage; "excess supply" = surplus = unsold stock.

Variations you will meet:

- **Reading a shortage or surplus off a diagram or table** (4 parts). On a diagram with lettered points, the gap is a **horizontal** distance at one price, running from the demand curve to the supply curve. At a price above equilibrium the surplus runs from the point on D (smaller quantity) to the point on S (larger quantity); a vertical distance, or one joining two different prices, is never the answer. With a table, compare the two columns at the old price and at the new price: a price above equilibrium gives a surplus, then cutting the price below equilibrium turns it into a shortage. "Suppliers produce more than is demanded at the price they chose" means **unsold stock**.
- **What equilibrium and disequilibrium mean** (3 parts). Equilibrium: the market **clears**; quantity demanded equals quantity supplied (it says nothing about profits). Disequilibrium: there **must** be either excess demand or excess supply; it does not need the government to act. A price held below equilibrium

by a government maximum price is a disequilibrium (excess demand).

- **How a market gets back to equilibrium** (2 parts). A surplus is removed by a **fall in price** (not by a decrease in demand or an increase in supply, which would make it worse or are shifts). A shortage is removed as the price rises, so the **quantity demanded falls** (contracts) and the quantity supplied rises.
- **A shift while the price stays put** (3 parts). Draw or picture the new curve and read both quantities **at the old price**. Demand up (hot weather and ice cream) or supply down → shortage. Demand down (a health scare) while firms keep producing the same amount → **excess supply**. When four diagrams are given, pick the one where, at price P, the demand quantity is to the **right** of the supply quantity for a shortage.

2. Multiple choice (calculation) (3 question parts)

1. **Measuring a shortage or surplus**: at the price asked, read Q_d and Q_s and subtract. Keep the units of the axis ("tonnes (000)" means thousands of tonnes: a gap of 400 is 400 000 tonnes), and say which is bigger.
2. **Spending or revenue at equilibrium**: find the row where $Q_d = Q_s$, then multiply **price × quantity**. Don't multiply at any other price, and don't add the two quantities.
3. **A change in supply or demand by a percentage at every price**: work out the new column first (for example, +50% at each price means $\times 1.5$), find the **new** equilibrium row, then compare price × quantity before and after. The answer is usually the **change** in revenue, so subtract.

3. Explain (4 marks) (1 question part)

These are marked **point plus development**, 1 mark each, so two developed points earn 4. For "Explain how a market moves from disequilibrium to equilibrium":

1. **Surplus side** (2): if supply is greater than demand there is a surplus / excess supply (1), so the **price falls** (1).
2. **Shortage side** (2): if demand is greater than supply there is a shortage / excess demand (1), so the **price rises** (1).
3. **Where it ends** (1): the price keeps changing until quantity demanded again equals quantity supplied, the market clears.
4. At least one of your marks must mention the **change in price**, the key idea. A diagram showing the gap and the price change can earn up to 2 of the marks, but words are enough.

If an Analyse (6) part is set, for example "Analyse, using a diagram, how a surplus is removed": draw a correct diagram (axes price and quantity, D and S labelled, the surplus marked as the gap at a price above equilibrium, the new price shown), then write the chain: surplus → unsold stock → firms cut the price → quantity demanded extends and quantity supplied contracts → the market clears at the equilibrium. **If a Define (2) part is set**: equilibrium is where quantity demanded equals quantity supplied (1), so the market clears at that price with no tendency for it to change (1); disequilibrium is where they are not equal (1), giving a shortage or a surplus (1). **If a Discuss (8) part is set** (for example "whether a market will always return to equilibrium"): why it will (price adjusts to remove surpluses and shortages); why it might not (prices fixed by

government or by firms, slow responses by producers such as farmers who cannot grow more until next season, demand or supply changing again before it settles); then a justified judgement ("it depends on whether the price is free to change").

Worked examples

Example 1

There is a shortage of mangoes at the current price. What happens as the market moves to equilibrium?

- **A** The price falls and supply increases.
- **B** The price rises, the quantity demanded contracts and the quantity supplied extends.
- **C** The demand curve shifts to the left.
- **D** The supply curve shifts to the right.

[1]

A shortage means the price is below equilibrium, so the price rises; buyers then want less and sellers offer more, moving along both curves. C and D are shifts, which the price change does not cause. The answer is **B**.
(1)

Example 2

The table shows the weekly demand and supply of a product.

Price (\$)	Quantity demanded	Quantity supplied
2	50	5
4	40	10
6	30	15
8	20	20
10	10	25

A new machine means supply doubles at every price. What happens to consumers' total spending on the product?

- **A** It falls by \$20.
- **B** It does not change.
- **C** It rises by \$20.
- **D** It rises by \$180.

[1]

At first the equilibrium is \$8 and 20 units, so spending is $8 \times 20 = 160$ dollars. The new supply column is 10, 20, 30, 40, 50, so the new equilibrium is \$6 and 30 units: spending is $6 \times 30 = 180$ dollars. It rises by $180 - 160 = 20$ dollars: **C.** (1) (D is the new spending, not the change. At the old \$8 there would now be a surplus of $40 - 20 = 20$, which is why the price falls.)

Example 3

Explain why a shortage of a product does not usually last in a free market. [4]

A shortage means that at the current price the quantity demanded is greater than the quantity supplied (1). Some consumers cannot buy the product, so they are willing to pay more, and sellers see they can raise the price (1). As the price rises, the quantity demanded contracts because the product is now less affordable (1), and the quantity supplied extends because selling it is more profitable (1). The price keeps rising until the quantity demanded equals the quantity supplied, so the market clears at the equilibrium price (1).

That is 5 creditable points for 4 marks, so one weak sentence still leaves full marks.

Example 4

Analyse, using a demand and supply diagram, how a market removes a surplus. [6]

Diagram: axes labelled price and quantity (1); a downward-sloping D and an upward-sloping S, labelled, crossing at the equilibrium (here \$4.50 and 45 units) (1); a price of \$6 above equilibrium, with the surplus marked as the gap between 30 demanded and 60 supplied (1); an arrow showing the price falling back to \$4.50 (1).

Analysis: At \$6, producers are willing to sell 60 units but consumers only want 30, so there is a surplus of 30 units and firms are left with unsold stock (1). To sell it, firms cut the price (1). As the price falls, the quantity demanded extends and the quantity supplied contracts until both are 45 units at \$4.50, and the market clears (1).

A diagram part like this is usually capped at 4 marks for the diagram and 2 for the words; the answer offers more than each cap, so it reaches 6.

Common mistakes

- **Shifting a curve instead of showing a gap.** Examiners in June 2023 saw many diagrams that shifted demand or supply to make a new, lower equilibrium when the question wanted a price held away from equilibrium. Show disequilibrium as the **horizontal gap between the curves at that price**, and label it "shortage" or "surplus".
- **Saying a surplus is removed by a decrease in supply.** The price falls, and the quantity supplied **contracts** along the curve. Use movement words (extend, contract) for price changes and shift words (increase, decrease) only for the causes of a shift.
- **Getting shortage and surplus the wrong way round.** Above equilibrium: surplus (too much supplied). Below: shortage. Check with the table: whichever quantity is bigger names the "excess".

- **Describing disequilibrium as "prices and quantities keep changing"**, or confusing it with market failure or a budget or trade imbalance (November 2021 and November 2022 reports). Disequilibrium means quantity demanded and quantity supplied are **not equal**.
- **Not linking a cause to the disequilibrium**. In June 2022 many answers copied "bad weather" from the source but did not say it reduced supply, so at the old price demand was greater than supply. Always finish the chain.
- **Measuring the gap with a price or a vertical distance**. A shortage or surplus is a **quantity**, read along the quantity axis.
- **Multiplying at the wrong price** in revenue questions. Use the equilibrium price and quantity, and after a change, the **new** equilibrium.

How to get the marks

- **Multiple choice is 1 mark with no penalty for a wrong answer**, so never leave one blank. Find the equilibrium first; then ask "is this price above or below it?".
- **Define** means the exact meaning: equilibrium is where quantity demanded **equals** quantity supplied and the market clears; disequilibrium is where they are **not equal**.
- **Explain** (4 marks): two developed points, 1 + 1 each. For how a market reaches equilibrium, give both sides (surplus → price falls, shortage → price rises) and end with demand equal to supply again. Mention the **price change**.
- **Analyse** (6 marks): chains of reasoning (gap → what buyers or sellers do → price change → extension and contraction → market clears), plus a diagram when asked. Listing words without linking them is capped low.
- **Discuss** (8 marks): both sides developed, then a justified judgement.
- **Diagrams**: label the axes **price** and **quantity**, label the curves D and S (and D1 or S1 after a shift), mark the equilibrium price and quantity on the axes with dashed lines, and show a shortage or surplus as a labelled gap at the stated price. Draw the curves to meet the axes neatly; don't shift a curve unless the question gives a cause.
- **Use the terms precisely**: equilibrium price, equilibrium quantity, market clears, disequilibrium, shortage (excess demand), surplus (excess supply), extension, contraction.

Quick check

1. The price of a product is above its equilibrium price. Which statement is correct?
 - **A** Quantity demanded is greater than quantity supplied, so there is a shortage.
 - **B** Quantity supplied is greater than quantity demanded, so the price will tend to fall.
 - **C** The demand curve will shift to the right.
 - **D** The market clears.

2. The table shows the monthly market for bicycles. Find the equilibrium price, the equilibrium quantity and total spending. Then say what exists at \$20 and at \$50, and how big it is.

Price (\$)	10	20	30	40	50
Quantity demanded	400	300	250	200	100
Quantity supplied	100	200	250	300	400

3. At a price of \$20, consumers want to buy 120 units of a product and firms want to sell 70. At \$25, both are 100. Name the situation at \$20, give its size, and say what happens next.
4. Explain how a very good harvest can lead to a surplus of strawberries. [4]

Answers

1. **B.** Above equilibrium, sellers offer more than buyers want (a surplus), so the price tends to fall. A describes a price below equilibrium; C is a shift, which a price change does not cause; D is true only at equilibrium.
(1)
2. The quantities are equal at \$30: equilibrium price \$30, quantity 250, spending $30 \times 250 = 7500$ dollars (\$7500). At \$20: 300 demanded, 200 supplied, a shortage of 100. At \$50: 400 supplied, 100 demanded, a surplus of 300.
3. A shortage (excess demand) of $120 - 70 = 50$ units. The price rises; the quantity demanded contracts and the quantity supplied extends until they are equal at the equilibrium of \$25 and 100 units.
4. A very good harvest increases the supply of strawberries (1), so the supply curve shifts to the right (1). At the old price, the quantity supplied is now greater than the quantity demanded, which is a surplus (excess supply) (1). Farmers are left with unsold strawberries, so the price falls until the market clears at a new, lower equilibrium price (1).

Past questions to try

- [0455/11/M/J/22 Q6](#): measuring a surplus from a diagram.
- [0455/13/O/N/23 Q9](#): what removes a surplus.
- [0455/12/O/N/22 Q6](#): choosing the diagram that shows a shortage after a shift.
- [0455/12/F/M/22 Q8](#): demand falls while supply stays the same.