

Cambridge AS & A Level · Economics 9708 · Notes

The interaction of demand and supply AS

Read online at pastopic.com/cambridge/economics-9708/notes/interaction-of-demand-and-supply

Last checked 1 October 2026

Read first: [Demand and supply curves](#), [Price elasticity, income elasticity and cross elasticity of demand](#), [Price elasticity of supply](#)

© 2026 Pastopic. Free for personal study. Please share the link, not the file.

What you need to know

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

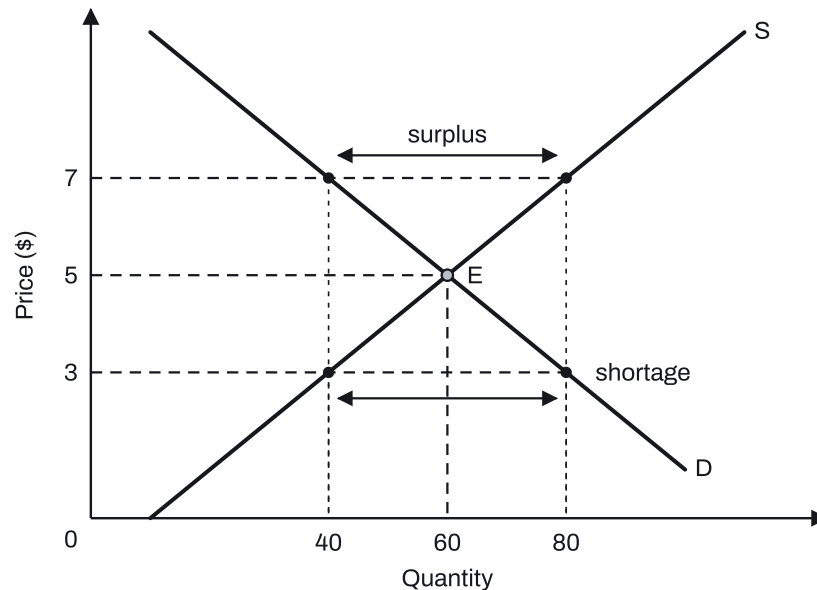
1. **Define market equilibrium and disequilibrium.** Equilibrium is the price at which the quantity consumers want to buy equals the quantity producers want to sell, so there is no pressure for the price to change. Disequilibrium is any other price, where there is a surplus or a shortage and the price is likely to change.
2. **Explain what shifts in the demand and supply curves do to the equilibrium price and quantity**, for one shift and for two shifts at the same time.
3. **Explain how markets are linked:** joint demand (complements), alternative demand (substitutes), derived demand and joint supply, and trace a change in one market through to another.
4. **Explain the functions of price in allocating resources:** rationing, signalling (passing on consumers' preferences) and giving incentives to producers.

This topic uses the demand and supply curves, and what shifts them, from the topic Demand and supply curves. Elasticities come in when you judge **how much** price and quantity change.

Understand it

Equilibrium and disequilibrium

Put the demand curve and the supply curve on one diagram. At most prices, buyers and sellers want different amounts. At one price the plans match: the **quantity demanded equals the quantity supplied**. That is the **equilibrium price**, and the amount traded there is the **equilibrium quantity**. Once there, nobody has a reason to change the price: every buyer willing and able to pay it gets the good, and every seller willing to sell at it finds a buyer. The market **clears**.



In this market demand is $Q_d = 110 - 10P$ and supply is $Q_s = 10 + 10P$. Setting them equal, $110 - 10P = 10 + 10P$, so $P = 5$ (\$5) and $Q = 60$.

Disequilibrium means the price is anywhere else:

- **Price above equilibrium (\$7): a surplus, or excess supply.** Firms want to sell 80 but buyers want only 40, so 40 units are left unsold. Stocks pile up and firms cut the price to sell them. As the price falls, quantity demanded **extends** (rises along the demand curve) and quantity supplied **contracts** (falls along the supply curve), until they meet at \$5 and 60.
- **Price below equilibrium (\$3): a shortage, or excess demand.** Buyers want 80 but only 40 are offered. Queues form, goods sell out and some buyers offer more. As the price rises, quantity demanded contracts and quantity supplied extends, until the gap closes.

So in a free market the price moves towards equilibrium on its own. **Movements** along the curves close the gap; neither curve shifts. A shortage lasts only if something stops the price rising, such as a price fixed below equilibrium by a government or a seller (tickets for a stadium final sold at a fixed price, face masks with a price cap during an outbreak).

Fixed supply. A stadium, a concert hall or a car park has a set number of places, so its supply curve is **vertical**. The price that clears it depends only on demand. If demand changes from day to day (a car park on a weekday and on a market day), a single fixed price can't clear it every day: to allocate the places by the market, the owner must vary the price with demand.

A change in equilibrium: one shift

When something other than the good's own price changes (incomes, the price of a related good, tastes, costs, taxes, subsidies, technology, weather), one curve **shifts**. At the old price there is now a surplus or a shortage, and the price moves to a new equilibrium.

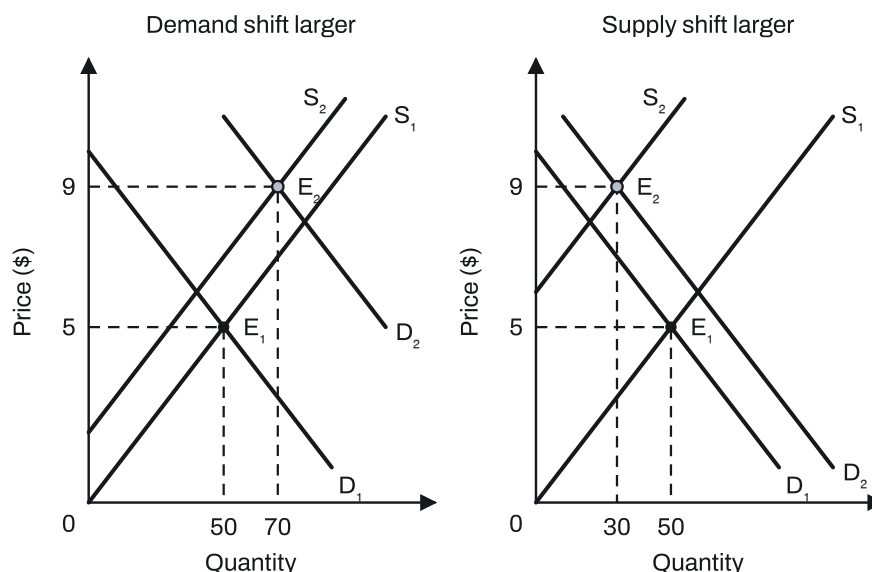
Change	Example	Equilibrium price	Equilibrium quantity
Demand increases (D right)	Incomes rise, for a normal good	Rises	Rises
Demand decreases (D left)	Incomes rise, for an inferior good	Falls	Falls
Supply increases (S right)	Subsidy to producers, better technology	Falls	Rises
Supply decreases (S left)	Drought, higher wages, an indirect tax	Rises	Falls

A rise in demand gives a shortage at the old price, so price rises, which makes quantity supplied **extend** along the unchanged supply curve. A fall in supply gives a shortage too, so price rises, which makes quantity demanded **contract** along the unchanged demand curve. One curve shifts; the other is moved along.

How much price and quantity change depends on the slopes (elasticities) of the curve that doesn't shift. When demand rises, inelastic supply means mostly a price rise and elastic supply mostly a quantity rise. When supply falls, inelastic demand means a big price rise and a small fall in quantity.

Two shifts at once

When both curves shift, each shift pushes price and quantity in some direction. If they agree on one variable, that change is certain. If they pull the other variable opposite ways, its change is **uncertain**: it depends on which shift is bigger.



Supply falls (a bad harvest) and demand rises (a health fashion) at the same time. **Both** push the price up, so the price rises for certain: from \$5 to \$9 in both diagrams. But the fall in supply cuts quantity and the rise in demand raises it. On the left the demand shift is bigger and quantity rises to 70; on the right the supply shift is bigger and quantity falls to 30.

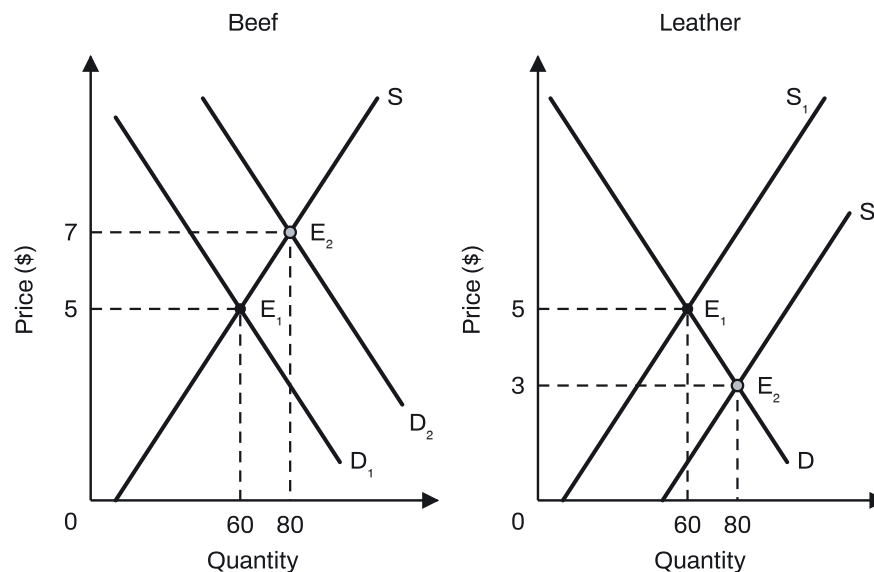
Demand	Supply	Price	Quantity
Increases	Increases	Uncertain	Rises
Decreases	Decreases	Uncertain	Falls
Increases	Decreases	Rises	Uncertain
Decreases	Increases	Falls	Uncertain

If the question tells you which shift is larger, the uncertainty goes. "Price rises and quantity falls" after both curves shift left means the fall in supply was **larger** than the fall in demand. "Price rises but quantity is unchanged" means supply fell and demand rose by amounts that exactly cancel for quantity.

How markets are linked

A change in one market spreads to others through four relationships. The trick is to ask, in the second market, **which curve** the change hits.

- **Joint demand (complements).** Goods used together: cars and petrol, printers and ink, smartphones and headphones or network connections. If the price of cars rises, fewer cars are bought (a movement along the demand for cars), so the **demand for petrol falls** (a shift left): petrol's price and quantity fall. A **fall** in the price of network connections **raises** the demand for smartphones.
- **Alternative (competitive) demand (substitutes).** Goods that do the same job: rice and pasta, tea and coffee, private houses and rented flats, major and minor roads. A health scare about rice shifts the **demand for pasta right**: pasta's price rises and its quantity supplied extends. A toll on major roads raises the price of using them, so journeys on major roads fall and journeys on minor roads rise.
- **Derived demand.** A good or factor wanted not for itself but for what it helps to make: batteries for electric cars, sugar for soft drinks, bricks and bricklayers for houses, electricity for battery-powered cars. If demand for the final good rises, demand for the input rises too. A subsidy to electric car makers raises the output of electric cars, so the demand for their batteries rises and batteries' price and sales rise. A tax on sugary drinks raises their price, fewer are sold, so demand for sugar falls and sugar's price falls.
- **Joint supply.** Two goods produced together, one often a **by-product** of the other: beef and leather (from the same cattle), butter and buttermilk, petrol and bitumen (from the same crude oil). Producing more of one automatically produces more of the other.



Demand for beef rises. Its price rises from \$5 to \$7 and farmers send more cattle to slaughter, so the quantity of beef supplied **extends** from 60 to 80. More cattle means more hides, so the **supply of leather shifts right**, even though nothing happened to the demand for leather: its price falls from \$5 to \$3 and 80 units are sold. It works the other way too: if people buy less butter, the quantity of butter supplied contracts (a movement along), and the supply of buttermilk shifts left (a shift).

Some chains have three links. If good X is in joint supply with Y and in joint demand with Z, a rise in demand for X raises X's output, so Y's **supply** rises (Y's price falls, sales rise), and Z's **demand** rises (Z's price rises, sales rise).

Past papers also use **substitutes in production** (competitive supply): crops such as spinach and cabbage that can be grown on the same land. More of one means less of the other, so a rise in the price of cabbage can shift the supply of spinach left.

The functions of price

In a market economy nobody tells firms what to produce. Prices do it. When the price of a good changes, it does three jobs at once.

- **Rationing.** When a good is scarce, the price rises until quantity demanded falls to the quantity available. Buyers who are not willing or able to pay the higher price drop out, so the good goes to those who value it most **in money terms**. This is how a shortage is removed.
- **Signalling (transmission of preferences).** A price change carries information. When consumers want more of a good, its price rises, and this tells producers that the good is wanted and that resources should move into it. A falling price tells them the reverse. Price passes consumers' preferences on to producers, and tells consumers about scarcity.
- **Incentive.** A higher price means higher profits, which **encourages** existing firms to raise output and new firms to enter; a lower price, with losses, persuades some firms to cut output or leave the market. Resources move from where they earn less to where they earn more.

A lasting rise in demand for a good shows all three: its price rises and rations the limited stock; the rise signals that consumers want more; and the extra profit gives firms an incentive to produce more and new firms to join. As output grows, the price falls back and the shortage ends. Over the whole economy, more land, labour and capital move into that good, and less is available for others: the opportunity cost of the change.

What the price mechanism does not do:

- It allocates by **ability to pay**, not need, so it doesn't share goods equally or guarantee everyone can have them.
- It doesn't provide **public goods**, because people who don't pay can't be stopped from using them, so no price can be charged.
- It doesn't work when the government keeps an effective **maximum price**: price can't rise to ration or signal, so the shortage stays.
- It doesn't maximise consumer surplus, or anyone's collective interest.
- It works best when consumers and producers have **good information** and resources can move easily. When resources are slow to move (years to open a mine) or supply is inelastic, prices can swing sharply before quantities adjust.

Key facts and formulas

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

Formula	Status
Equilibrium: $Q_d = Q_s$	Learn it
Surplus (excess supply) = $Q_s - Q_d$ when price is above equilibrium	Learn it
Shortage (excess demand) = $Q_d - Q_s$ when price is below equilibrium	Learn it
From equations $Q_d = a - bP$ and $Q_s = c + dP$: $P = \frac{a - c}{b + d}$, then substitute to find Q	Learn it
Supply rises by k units at every price: new $Q_s = \text{old } Q_s + k$ at each price	Learn it
Percentage change = $\frac{\text{new} - \text{old}}{\text{old}} \times 100$	Learn it
One shift: D right → P up, Q up; D left → P down, Q down; S right → P down, Q up; S left → P up, Q down	Learn it
Two shifts: the variable both shifts move the same way is certain; the other is uncertain	Learn it

How to do it

In the questions we have tagged for this topic (98 questions, 2021–2025), 84 are Paper 1 multiple choice and 14 are Paper 2 data response or essay questions, where we counted only the parts about this topic. One question (9708/23/M/J/22 Q1) mixes two types, so the counts add up to 99.

Question type	Questions
Predict the new equilibrium after one or two curve shifts	23
Trace effects through related markets	23
Define equilibrium or disequilibrium and explain how a market clears	14
Explain the functions of price in resource allocation	12
Explain or assess, with a diagram, how an event changes price and quantity	10
Work backwards: identify the cause of a change in equilibrium	10
Find equilibrium, a surplus or a shortage from a table or equation	4
Draw a labelled demand and supply diagram showing a price change	3

Paper 2 parts are marked in three ways. **Data response parts of 4 or 6 marks** give up to 3 marks for each side (with a maximum for analysis, often 4) and up to 2 for evaluation, one kept for a justified conclusion. **Essay part (a), 8 marks**, is point-based: up to **3** for knowledge (AO1), **3** for analysis (AO2) and **2** for evaluation (AO3). **Essay part (b), 12 marks**, is levels-marked: Table A gives up to **8** for knowledge and analysis (Level 3 is 6–8, Level 2 is 3–5, Level 1 is 1–2) and Table B up to **4** for evaluation (Level 2 is 3–4 with a justified conclusion). A one-sided answer gets **no** evaluation marks.

1. Predict the new equilibrium after one or two curve shifts (23 questions)

All multiple choice.

- 1. Take each event on its own.** Ask which market it affects, whether it is a demand factor or a supply factor, and which way it shifts that curve. A subsidy, better technology or cheaper materials shift supply right; a tax, higher wages, a shortage of an input or bad weather shift it left. Higher incomes shift demand right for a normal good and **left** for an inferior good; a dearer substitute shifts it right; a dearer complement shifts it left.
- 2. Mark the shifts on the diagram** (or sketch one) and find where the new curves cross.
- 3. With two shifts, use the table above:** the variable both shifts agree on is certain, the other is "uncertain" unless the sizes are given.

Variations you will meet:

- **Pick the lettered point.** For example, a bigger subsidy to solar producers (supply right) and dearer alternative energy (demand right): the new point is to the **right** of the old one, and whether it is higher or lower depends on the sizes drawn.

- **Answer rows with "uncertain".** Gas for steelmaking is cut (supply of steel left) during a recession (demand for steel left): quantity falls, price is uncertain.
- **Sizes given.** "Price rises and quantity falls" after two decreases means the fall in supply was larger than the fall in demand.
- **Certain to cause a shortage:** a rise in demand **and** a fall in supply at a price that doesn't adjust (queues for petrol).
- **An inferior good and rising incomes:** demand shifts left, so price and quantity both fall.
- **A fixed-supply market** (the number of golf courses): supply is vertical, so a rise in demand changes only the price; closing some courses shifts the vertical line left.
- **Choose the right diagram** from four: check which curve moves and which way before looking at prices.
- **Long-run effects:** less investment in finding new oil reserves means supply **shifts left** in the future and the price rises (not a movement along demand).

2. Trace effects through related markets (23 questions)

All multiple choice.

1. **Name the relationship** between the two goods: complements (joint demand), substitutes (alternative demand), derived demand, or joint supply.
2. **Work out what happens in the first market:** does its price rise or fall, and does the quantity traded rise or fall?
3. **Decide which curve that moves in the second market.** Joint demand, substitutes and derived demand move the second good's **demand** curve; joint supply moves its **supply** curve.
4. **Read off the second good's price and quantity**, and remember the first good moves **along** its own curve.

Variations you will meet:

- **Complements with a supply change.** An increase in the supply of good Y lowers Y's price, so more Y is bought and the demand for its complement X rises: X's price and quantity both **rise**.
- **Substitutes with a supply change.** A shortage of materials for good P reduces its supply, so P's price rises and demand for P **contracts** (a movement), while demand for its substitute Q **shifts right**.
- **Derived demand from a tax or subsidy.** A tax on sugary drinks: drinks' price rises, sugar's price falls. A subsidy to battery-car makers: more battery cars, so the price and sales of batteries (or electricity) rise.
- **Joint supply.** Less demand for butter: butter moves left along its supply curve, and buttermilk's supply curve shifts left. More demand for X in joint supply with Y: Y's price falls and its sales rise.
- **Definitions and examples.** Joint supply means one good is a **by-product** of producing another; a product in joint demand with a smartphone is one used with it (headphones), not another brand (a substitute) or the metals inside it (derived demand).
- **Two diagrams to name the link.** If a rise in demand for X is shown next to a rightward shift in the **supply** of Y, the goods are in joint supply.
- **Three goods at once** (joint supply with one, joint demand with another): follow each link separately.

3. Define equilibrium or disequilibrium and explain how a market clears (14 questions)

All multiple choice.

1. **Equilibrium**: quantity demanded equals quantity supplied, with no tendency for price to change.
2. **Disequilibrium**: at the ruling price there is a surplus or a shortage, so the price is **likely to change** (not "the government must intervene", and not always a shortage).
3. **Adjustment from a shortage** (price below equilibrium): price rises, quantity demanded **falls**, quantity supplied **rises**. **From a surplus** (price above equilibrium): price falls, quantity demanded **rises**, quantity supplied **falls**.

Variations you will meet:

- **The cause of a lasting shortage**: a price fixed **below** equilibrium. Inelastic supply alone does not cause one, because the price can still rise to a new equilibrium where there is no excess demand.
- **Fixed-capacity events**: a stadium with 40 000 seats sold at a fixed price that sell out at once is a vertical supply at 40 000, with the price **below** where demand crosses it. A band that becomes more popular: the vertical supply stays put and demand shifts right, so only the price rises.
- **Reading a diagram**: at a price above equilibrium, the surplus is the horizontal gap between the demand curve and the supply curve at that price. When price falls from above equilibrium to below it, the rise in quantity demanded and the fall in quantity supplied are not usually equal.

4. Explain the functions of price in resource allocation (12 questions)

Multiple choice (10):

1. **Match the statement to the function**. Buyers being priced out of a scarce good is **rationing**. A price change telling producers or consumers about market conditions is **signalling**. A price change persuading producers to enter, expand, cut back or leave is the **incentive** function.
2. **Know what price does not do**: provide public goods, share goods equally or by need, maximise consumer surplus, or work under an effective maximum price. The best allocation needs good information for consumers and producers.

Paper 2, 6 or 12 marks ("assess the likely effects on resource allocation of a continuing increase in demand", "consider whether the price mechanism is allocating resources successfully"):

1. **Knowledge (AO1)**: define the price mechanism and each of its three functions.
2. **Analysis (AO2)**, applied to the good in the question, one developed chain per function:
 - **rationing**: excess demand at the old price → price rises → buyers unwilling or unable to pay drop out → the shortage is removed;
 - **signalling**: the rising price shows producers that consumers want more → resources are directed towards this good;
 - **incentive**: higher profits → existing firms expand, new firms enter → output rises and the price eases;
 - optionally a **PPC**: more resources in this good means less of other goods (opportunity cost).

3. **The other side (AO2/AO3):** how well it works **depends on** how quickly supply can respond (time lags, inelastic supply, scarce raw materials or skilled labour), information, market power, regulation such as environmental limits, and whether the result is fair (rationing by income).
4. **Judgement (AO3):** answer the exact words, for example "prices will reallocate resources in the long run, but in the short run the main effect is a higher price because supply is inelastic".

5. Explain or assess, with a diagram, how an event changes price and quantity (10 questions)

Paper 2. Usually essay part (a) [8], sometimes a data response part of 4–6 marks.

Answer plan for 8 marks:

1. **Knowledge (AO1, 3 marks).** Define equilibrium (1). Draw a **fully labelled** diagram: axes "Price" and "Quantity", curves D_1 , D_2 , S_1 , S_2 , old and new equilibria P_1 , Q_1 and P_2 , Q_2 (1 for each correct shift). Two diagrams are fine when two events are involved.
2. **Analysis (AO2, 3 marks).** One developed chain for each event, up to 2 marks each: *event* → *which curve shifts and why* → *shortage or surplus at the old price* → *price rises or falls* → *extension or contraction along the other curve* → *new equilibrium*.
3. **Evaluation (AO3, 2 marks).** An "it depends" point (1): with two shifts, the outcome depends on their **relative sizes**; how far price moves depends on **PED and PES**; the short run differs from the long run as supply becomes more elastic. Then a justified conclusion, for example "price will almost certainly rise, but quantity could go either way" (1).

Variations you will meet:

- **"Consider how certain you are of the new price"** (two shifts that both raise price): price rising is certain; the size of the rise isn't; quantity is uncertain.
- **Short run and long run** after a rise in demand: in the short run supply is inelastic, so price rises a lot; in the long run new firms enter and supply becomes more elastic (or shifts right), so price falls back while quantity keeps rising.
- **Higher wages in one industry against the whole economy.** A pay rise for workers making one good raises its costs: **only supply** shifts left, so price rises and quantity falls. A pay rise for **all** workers also raises incomes: supply shifts left **and** demand shifts right (for a normal good), so price rises for certain and quantity is uncertain.
- **A fall in incomes for a normal and an inferior good:** use **two** diagrams: demand shifts left for the normal good (P and Q fall) and right for the inferior good (P and Q rise).
- **Data response:** give one demand reason and one supply reason from the case, each linked to the price change (a rise in demand larger than the rise in supply explains a rising price even though supply grew). Or the effect of building **stocks** on future price and quantity: buying for storage now removes supply and raises the price; releasing stock after a poor harvest adds supply and holds the price down, so prices are more stable; but storage costs and loss of quality limit this.

6. Work backwards: identify the cause of a change in equilibrium (10 questions)

All multiple choice.

1. **Read the change:** which way did price go, and which way did quantity go?
2. **Match it to a shift:** price and quantity both up → demand rose; both down → demand fell; price up and quantity down → supply fell; price down and quantity up → supply rose. Price up with quantity unchanged → supply fell and demand rose.
3. **Test each option** by asking which curve it shifts and which way. Throw out options that shift the wrong curve.

Variations you will meet:

- **A table of two periods:** 8000 units at \$2, then 9000 at \$2.50: both up, so demand rose, for example because a **substitute** became dearer. A minimum price or a tax would not raise the quantity.
- **"Why might the price stay the same?"** If a substitute gets cheaper and a complement dearer, demand for X falls, so the price would fall; for it to stay the same, **supply must fall too**, for example because some firms stop producing.
- **A price graph over time:** a falling price fits new producers entering or good harvests (supply right); a rising price fits bad harvests or a rise in demand.
- **Exports and exchange rates:** a good sold abroad has foreign buyers, so a rise in foreign incomes shifts demand right; higher domestic wages shift supply left. Both together raise the price and can leave quantity unchanged. A **depreciation** makes imports dearer in the home currency, which shifts the supply of an imported good left.
- **"Which could NOT have caused it?"** For a derived-demand good (switches for new houses), anything that raises house-building shifts demand right; removing a tax on the switches themselves shifts **supply** instead.

7. Find equilibrium, a surplus or a shortage from a table or equation (4 questions)

All multiple choice.

1. **From a table:** equilibrium is the row where quantity demanded equals quantity supplied. At any other price, subtract to find the surplus or shortage.
2. **Supply rises by a fixed amount at every price:** add it to every quantity supplied, then find the new matching row.
3. **From equations:** set $Q_d = Q_s$ and solve for P , then substitute to get Q . At a given price, work out both quantities and compare.

Examples:

- $Q_d = 300 - 15P$ and $Q_s = 60 + 25P$: $300 - 15P = 60 + 25P$, so $40P = 240$, $P = 6$ (\$6) and $Q = 210$. At \$8, $Q_d = 180$ and $Q_s = 260$: a surplus of 80.

- **Fixed supply:** supply is 150 units whatever the price and $Q_d = 450 - 20P$. At \$10, $Q_d = 250$: a shortage of 100. Equilibrium is where $450 - 20P = 150$, so $P = 15$ (\$15).
- **The subsidy needed to clear a market at a set price:** find the quantity demanded at that price, then find the price at which producers would supply that quantity; the gap between the two prices is the subsidy per unit.

8. Draw a labelled demand and supply diagram showing a price change (3 questions)

Paper 2 data response, 2 marks: "use a demand and supply diagram to show why the price rose (or fell)".

1. **Axes** labelled "Price" and "Quantity" (of the good named), curves labelled D and S.
2. **The correct shift** from the case (1): typhoons, drought or frost → **supply left**; a bumper harvest or new producers → **supply right**. For a price fall when both curves moved, show supply shifting **further** right than demand.
3. **The new equilibrium** with the price change marked: P_1 and P_2 , Q_1 and Q_2 , or an arrow (1). No written explanation is needed if the diagram is clearly annotated.

Worked examples

Example 1

Petrol cars and electric cars are substitutes. Home charging units are in joint demand with electric cars. The government raises the tax on petrol. What is the likely effect on the price of petrol cars and the price of home charging units?

	Price of petrol cars	Price of home charging units
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

[1]

Petrol and petrol cars are complements: dearer petrol makes petrol cars more expensive to run, so demand for petrol cars shifts left and their price falls. Buyers switch to the substitute, so demand for electric cars shifts right, and with it the demand for home charging units (joint demand), so their price rises. The answer is **B**. (1)

C and D confuse the tax on petrol with a tax on the cars; A misses that electric cars are a substitute.

Example 2

The table shows the market for a good.

Price (\$)	Quantity demanded	Quantity supplied
2	140	60
3	120	80
4	100	100
5	80	120
6	60	140

A subsidy raises supply by 40 units at every price. What is the new equilibrium price and quantity?

- **A** \$2 and 140
- **B** \$3 and 120
- **C** \$4 and 100
- **D** \$4 and 140

[1]

The new quantities supplied are 100, 120, 140, 160 and 180. They equal quantity demanded at \$3, where both are 120. The answer is **B**. (1)

C is the old equilibrium; D adds 40 to the old equilibrium without letting the price change (at \$4 there would be a surplus of 40).

Example 3

With the help of a diagram, explain what is meant by market equilibrium and consider how the equilibrium price and quantity of electric bicycles are likely to change when the cost of batteries falls and the price of petrol rises.

[8]

Market equilibrium is the price at which the quantity of electric bicycles consumers are willing and able to buy equals the quantity producers are willing to sell, so there is no surplus or shortage and no pressure for the price to change (AO1, 1).

Diagram: price and quantity of electric bicycles on the axes; S_1 shifting right to S_2 (AO1, 1) and D_1 shifting right to D_2 (AO1, 1); the equilibrium moving from P_1, Q_1 to P_2, Q_2 , with Q_2 clearly larger.

Batteries are a major cost of making an electric bicycle. When their cost falls, each bicycle is cheaper to produce, so firms are willing to supply more at every price and the supply curve shifts to the right. At the old price there is now a surplus, so the price falls and quantity demanded extends (AO2, 2).

Petrol is a complement to cars and motorbikes, which are substitutes for electric bicycles. Dearer petrol makes driving more expensive, so some travellers switch to electric bicycles and demand shifts to the right. At the old price there is a shortage, so the price rises and quantity supplied extends (AO2, 1: the chain is developed, and analysis is capped at 3).

Both shifts increase the quantity traded, so the equilibrium quantity will almost certainly rise. The price is uncertain: the fall in costs pushes it down, the rise in demand pushes it up, and the result depends on the relative sizes of the two shifts. If battery costs fall sharply while petrol rises only a little, the price will fall; if demand for electric bicycles is also rising because of wider concern about fuel costs, the price may rise (AO3, 1).

So I am confident that more electric bicycles will be sold, but not of the direction of the price, which will depend on how large and how lasting the petrol price rise is compared with the fall in battery costs (AO3, 1, justified conclusion).

Total: $3 + 3 + 2 = 8$.

Example 4

Assess whether the price mechanism is likely to reallocate resources successfully following a lasting increase in demand for plant-based milk. [12]

Knowledge and analysis (Table A):

The price mechanism allocates resources through the interaction of demand and supply in free markets. When demand for plant-based milk (oat, soya and almond drinks) increases, there is a shortage at the old price. The price rises, and this **ration**s the limited supply: some buyers are not willing or able to pay more, so quantity demanded contracts until it matches what is available.

The higher price also **signals** to producers that consumers want more plant-based milk. At the same time dairy milk, a substitute, faces lower demand and a falling price, which signals that fewer resources are wanted there.

The higher price and profits give an **incentive** to existing producers to increase output, for example by running factories for extra shifts, and attract new firms into the market. Farmers have an incentive to grow more oats and soya. As supply increases, the shortage disappears and the price falls back towards a new equilibrium with more output. Land, labour and capital move from dairy farming towards plant-based production. On a production possibility curve the economy moves along the curve towards more plant-based milk and less dairy milk, with the dairy milk given up as the opportunity cost.

However, resources may not move quickly. Crops take a season to grow and new factories take time to build, so supply is inelastic in the short run and the main effect is a higher price rather than more output. Dairy farmers' land, cattle and skills are not easily switched to plant crops, so some resources may stay unemployed. The reallocation may also depend on information: if producers believe the rise in demand is a passing fashion, they will not invest.

(Developed, accurate chains on how rationing, signalling and incentives work, with the limits, focused on plant-based milk: Level 3, 8 marks.)

Evaluation (Table B):

Whether the price mechanism succeeds depends on the time period and on how mobile the resources are. Because the rise in demand is lasting, the signal is strong and firms have time to respond, so in the long run the mechanism is likely to reallocate resources successfully, since plant-based milk uses factories and crops that can be expanded within a few years. In the short run it is less successful: prices rise sharply, poorer consumers are rationed out, and dairy workers may be unemployed while they retrain. Overall the price mechanism is likely to reallocate resources successfully over time, but not quickly or without costs, and the less mobile the resources, the slower it will be.

(A balanced judgement that answers "successfully", says what it depends on and reaches a conclusion: Level 2, 4 marks.)

Common mistakes

- **Mixing up shifts and movements.** Examiners see answers where a change in price "shifts" demand, or where a cost change is shown as a movement along supply. The good's **own** price moves you along both curves; everything else shifts one of them.
- **Shifting the wrong curve in a related market.** Joint supply changes the other good's **supply**; complements, substitutes and derived demand change its **demand**. In one question only 42% of candidates saw that a rise in demand for X shifting the supply of Y means joint supply.
- **Thinking inelastic supply causes a shortage.** A shortage lasts only if the price can't rise; with inelastic supply the price rises to a new equilibrium with no excess demand. Many candidates chose the inelastic-supply option.
- **Being too sure with two shifts.** When two shifts pull one variable opposite ways, say it is uncertain and that it depends on their relative sizes. That is also the evaluation point examiners reward.
- **Confusing the functions of price.** "A price fall shows consumers a good is less popular" is information, not the incentive function; the incentive function is about producers expanding or leaving. Examiners report answers on the functions of price that were vague and drifted into market against planned economies.
- **Asserting instead of explaining.** A shortage on a diagram needs the reason: price below equilibrium, so quantity demanded exceeds quantity supplied because... Examiners say diagrams are an aid to explanation, not a substitute for it.
- **One diagram when the question needs two**, for example normal and inferior goods when incomes fall.
- **Poorly labelled diagrams.** Label both axes, every curve (D_1 , D_2 , S_1 , S_2) and the old and new equilibrium price and quantity.
- **Ignoring the case study.** In data response parts, the reasons must come from the extract (drought, a weaker currency, new producers), linked to which curve shifts. Examiners report candidates giving reasons that were not in the data, or that would have lowered the price.
- **No conclusion.** "Consider", "assess" and "discuss" need a judgement at the end, even when the analysis is good.

How to get the marks

- **Command words.** *Explain*: give reasons, "because... so...". *Consider, assess, discuss*: both sides, then a judgement that answers the exact question. *Use a diagram to show*: the diagram carries the marks, so it must be accurate and labelled.
- **Definitions** of equilibrium need "quantity demanded **equals** quantity supplied" and "no tendency for the price to change". Disequilibrium needs "surplus or shortage at the current price".
- **Diagrams**: "Price" and "Quantity" on the axes, curves labelled, the shift shown with the new curve labelled, P_1 , P_2 , Q_1 , Q_2 marked. With two events, one diagram with both shifts or two separate diagrams both earn the marks.
- **Chains of reasoning** earn analysis marks: event → which curve shifts → surplus or shortage → price change → extension or contraction → new equilibrium. Use "extension" and "contraction" for movements, "increase" and "decrease" for shifts.
- **8-mark part (a)**: 3 knowledge (definition, diagram, correct shifts), 3 analysis (up to 2 for each well-explained event), 2 evaluation (relative sizes of shifts, PED and PES, time; then a justified conclusion).
- **12-mark part (b)**: Level 3 analysis needs accurate, developed chains on **both** sides, tied to the setting in the question. Evaluation needs a weighed judgement; a one-sided answer gets no evaluation marks.
- **Functions of price** answers must name and explain rationing, signalling and incentives in the context given, not describe market and planned economies.
- **Multiple choice**: one mark each, no penalty for guessing. Sketch the curves, draw each shift in turn, and write "↑", "↓" or "?" beside price and quantity.

Quick check

1. Demand for a good is $Q_d = 240 - 12P$ and supply is $Q_s = 40 + 8P$. (a) Find the equilibrium price and quantity. (b) If the price is \$8, is there a surplus or a shortage, and how large? What happens next in a free market?
2. New machinery cuts the cost of making tablet computers, and at the same time a recession reduces incomes. Tablets are a normal good. What happens to their equilibrium price and quantity?
3. Crude oil is refined into petrol, and bitumen (used for roads) is produced at the same time. The demand for petrol rises. Explain what happens to the price and quantity of bitumen.
4. Explain why the demand for bricks is a derived demand, and what happens to the price and quantity of bricks when house-building falls.
5. Name the function of price shown by each statement: (a) the price of concert tickets rises so that only those willing and able to pay most get a seat; (b) rising avocado prices tell farmers that consumers want more avocados; (c) higher profits from avocados lead farmers to plant more avocado trees.

Answers

1. (a) $240 - 12P = 40 + 8P$, so $20P = 200$, $P = 10$ (\$10) and $Q = 120$. (b) At \$8, $Q_d = 144$ and $Q_s = 104$: a **shortage** of 40. The price rises; quantity demanded contracts and quantity supplied extends until they meet at \$10 and 120.
2. Lower costs shift supply right (price down, quantity up); lower incomes shift demand left (price down, quantity down). The price **falls** for certain; the change in quantity is **uncertain** and depends on which shift is bigger.
3. Petrol and bitumen are in **joint supply**. The rise in demand for petrol raises its price, so refiners process more crude oil and the quantity of petrol supplied extends. This produces more bitumen, so the supply of bitumen shifts right: its price falls and its quantity rises.
4. Bricks are wanted not for themselves but to build houses, so the demand for bricks depends on the demand for houses. When house-building falls, the demand for bricks shifts left, so their price and quantity both fall.
5. (a) Rationing. (b) Signalling (transmission of preferences). (c) Incentive.

Past questions to try

- 9708/13/M/J/24 Q7: two shifts at once, with price or quantity uncertain.
- 9708/13/M/J/22 Q10: joint supply and joint demand linked to one good.
- 9708/12/O/N/23 Q12: surplus or shortage from demand and supply equations.
- 9708/22/M/J/23 Q3: part (a), equilibrium and a wage rise across the whole economy.