

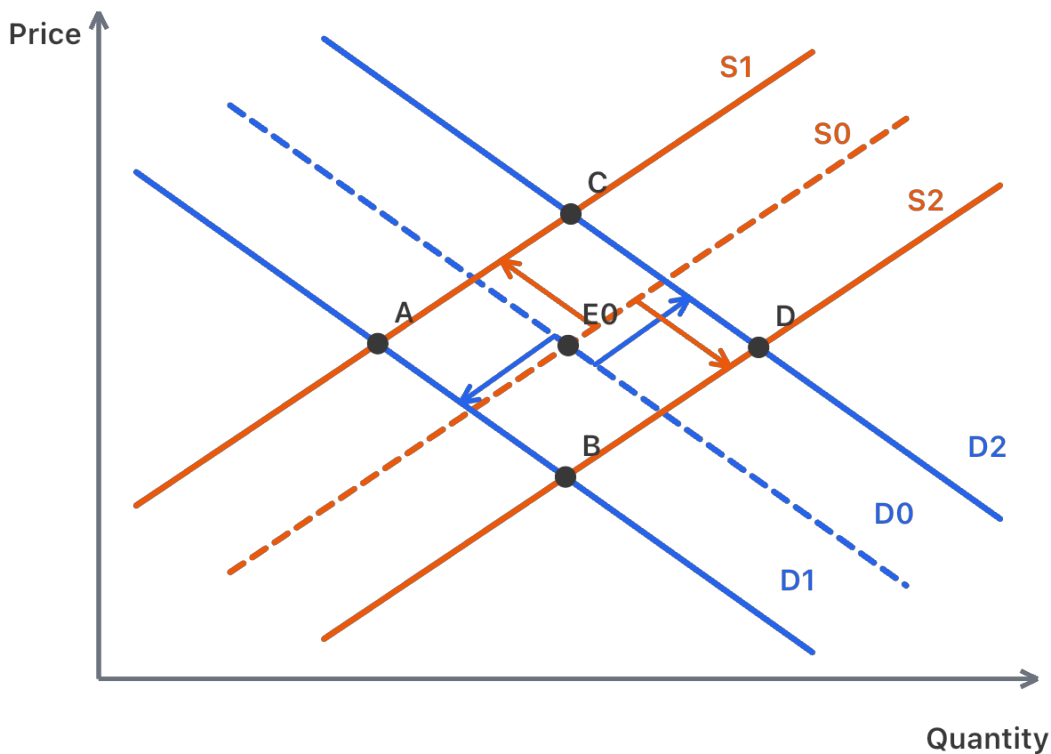


Demand, Supply, Surplus and Intervention

Name: _____

Class: _____

1. In the market for a good, demand increases while supply decreases. The diagram below marks four possible intersections of the shifted curves.



Which labelled point shows the new market equilibrium?

- A. Point A
- B. Point B
- C. Point C
- D. Point D

2. Three consumers – Ka Ming, Wing and Sze Kei – are the only buyers of bubble tea in a small market. Their individual demand schedules are:

Price (\$ per cup)	Ka Ming (cups)	Wing (cups)	Sze Kei (cups)
30	4	2	0
25	6	4	1
20	8	6	3
15	10	9	6

A fourth consumer then joins the market whose quantity demanded at every price is exactly half of Wing's quantity demanded, rounded down to a whole cup. What is the new market quantity demanded at a price of \$25 per cup?

- A. 11 cups
- B. 12 cups
- C. 13 cups
- D. 17 cups

3. In the market for a good, a new technology greatly lowers production costs at the same time as an advertising campaign successfully raises consumers' preference for the good. The rightward shift of demand is known to be smaller than the rightward shift of supply. Which of the following is correct?

- A. Equilibrium quantity rises and equilibrium price falls.
- B. Equilibrium quantity rises and equilibrium price rises.
- C. Equilibrium quantity rises but the change in equilibrium price is indeterminate.
- D. Equilibrium price falls but the change in equilibrium quantity is indeterminate.

4. Ten identical bakeries each supply 15 loaves of bread per day at a price of \$12 per loaf. The market is initially in equilibrium at \$12, where 150 loaves are demanded and supplied per day.

Then flour becomes much more expensive, so that each bakery is willing to supply only 9 loaves per day at \$12. At the same time, 4 identical new bakeries enter the market, each also willing to supply 9 loaves per day at \$12.

At the unchanged price of \$12, what is the market condition immediately after these changes?

- A. A shortage of 24 loaves, so the price tends to rise.
- B. A surplus of 24 loaves, so the price tends to fall.
- C. A shortage of 60 loaves, so the price tends to rise.
- D. Equilibrium is maintained, because the 4 new bakeries exactly offset the higher flour cost.

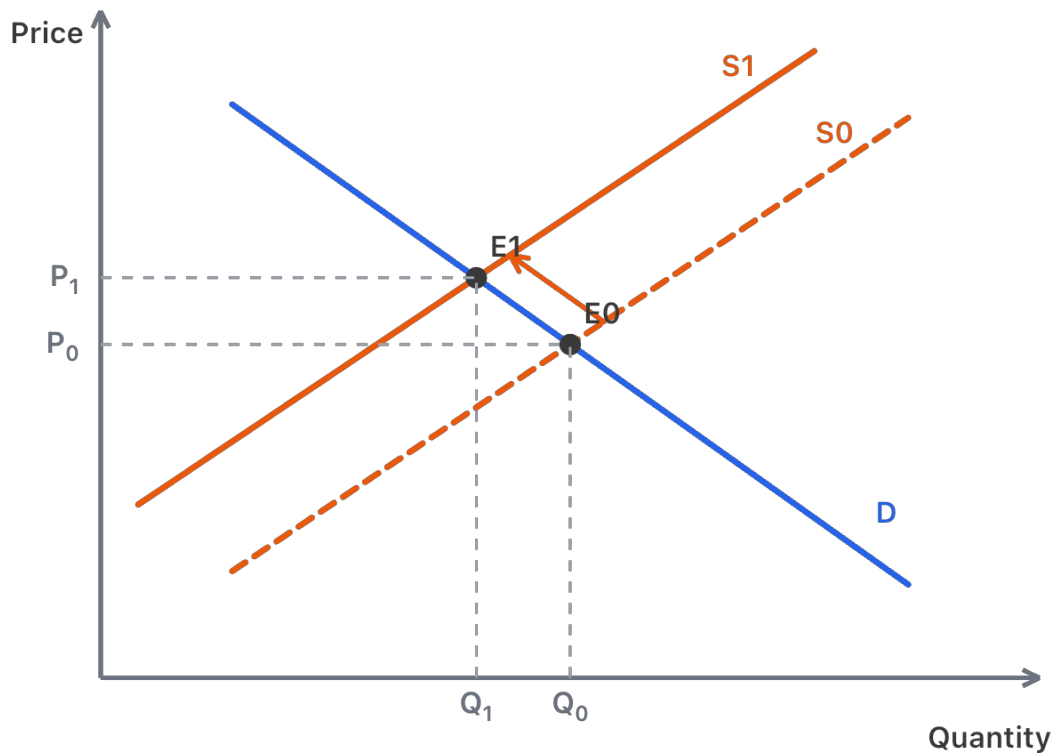
5. The table shows the market demand and supply schedules for a brand of USB fans sold in Sham Shui Po.

Price (\$)	Quantity demanded (units)	Quantity supplied (units)
10	100	20
15	80	40
20	60	60
25	40	80
30	20	100

Treat each listed price as the maximum buyers will pay, and the minimum sellers will accept, for each block of 20 units along the schedules. At the free-market equilibrium, what is the consumer surplus?

- A. \$300
- B. \$400
- C. \$600
- D. \$1200

6. A sharp rise in imported feed costs affects the Hong Kong market for fresh eggs, as shown below.



Which statement about surplus in this market is correct?

- A. Consumer surplus falls, and total social surplus is smaller than before
- B. Consumer surplus falls, but total social surplus is unchanged because the loss is transferred to producers
- C. Consumer surplus rises because the price is higher
- D. Consumer surplus is unchanged because the demand curve has not moved

7. The table shows the demand and supply schedules for Good Z.

Unit price (\$)	Quantity demanded	Quantity supplied
6	120	40
7	110	50
8	100	60
9	90	70
10	80	80
11	70	90
12	60	100

The government now imposes a \$2 per-unit tax on sellers of Good Z. Which statement is correct?

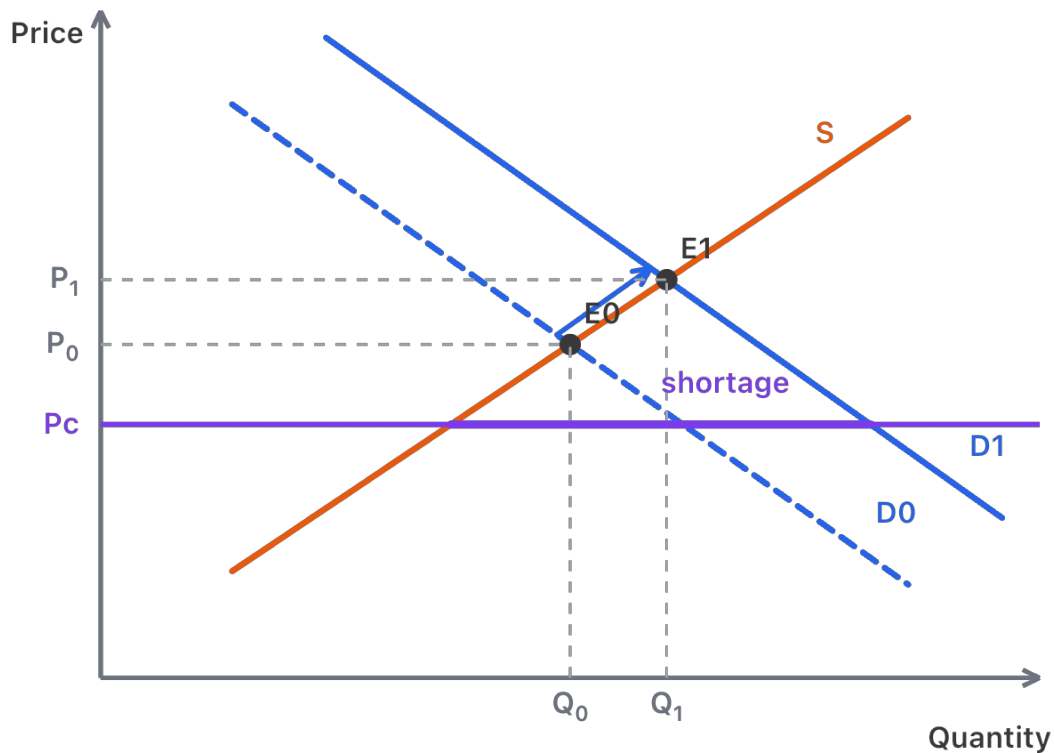
- A. Sellers' revenue net of tax is \$630.
- B. Total tax revenue is \$160.
- C. The tax burden borne by sellers is \$140.
- D. Buyers' total expenditure rises by \$30.

8. The government grants a \$6 per-unit subsidy to producers of a recycled notebook. After the subsidy, the price paid by consumers falls by \$2. Which of the following statements is/are correct?

- (1) Supply is less elastic than demand.
- (2) Producers receive \$4 per unit of the subsidy benefit.
- (3) The supply curve shifts to the left.

- A. (1) and (2) only
- B. (2) only
- C. (2) and (3) only
- D. (1), (2) and (3)

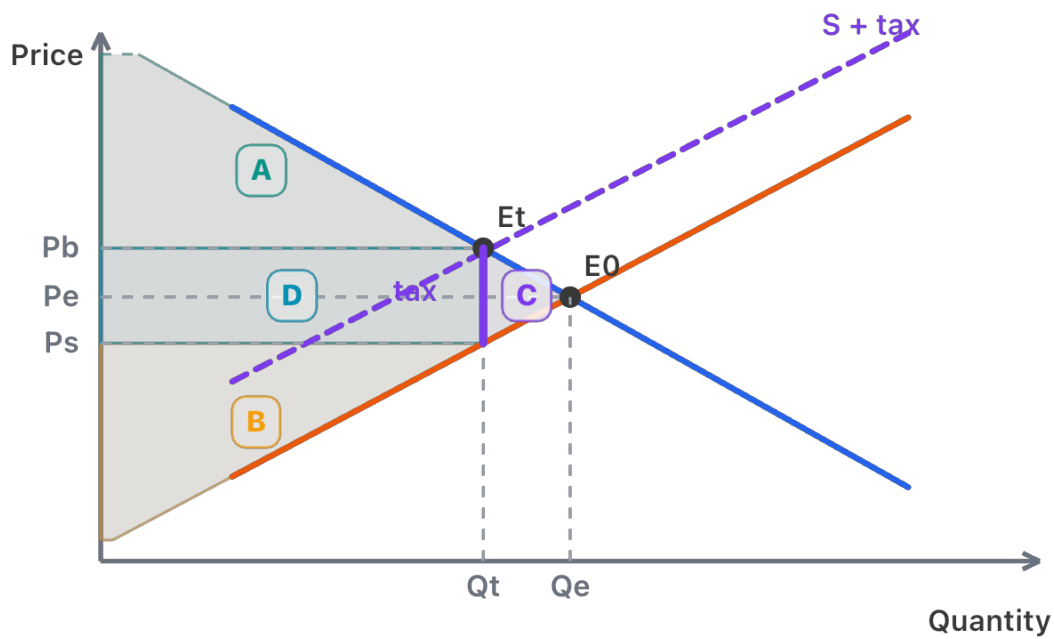
9. An effective price ceiling on a rental service is kept unchanged, while demand for the service increases, as shown below.



Other things being equal, which statement is correct?

- A. The quantity transacted is unchanged, but the shortage becomes larger
- B. Both the quantity transacted and the shortage increase
- C. The money price rises above the ceiling and the shortage disappears
- D. The shortage is unchanged because the ceiling price has not been altered

10. The diagram shows the market for a good after a unit tax is imposed on sellers. Four regions are shaded and labelled with letters.



Which labelled area(s) together measure the total surplus enjoyed by buyers and sellers after the tax?

- A. Areas A and B
- B. Area A only
- C. Areas A, B and C
- D. Areas B and C

Demand, Supply, Surplus and Intervention

Answers

1 C

Start by identifying which curves must move. An increase in demand shifts the demand curve to the right. A decrease in supply shifts the supply curve to the left.

The new equilibrium must therefore be the intersection of the rightward-shifted demand curve and the leftward-shifted supply curve. That is the intersection lying highest up among the four candidates, because both shifts push price upward.

Comparative statics:

- Price: demand up pushes price up, supply down pushes price up → price definitely rises.
- Quantity: demand up pushes quantity up, supply down pushes quantity down → quantity change is indeterminate without knowing the relative sizes of the shifts.

So the correct point is the highest intersection, Point C.

A useful habit: always move each curve one at a time, then read off where the two new curves cross.

2 C

Market demand is found by horizontal summation: at each price, add up the quantities demanded by every consumer.

Step 1 – Original market quantity at \$25: $6 + 4 + 1 = 11$ cups.

Step 2 – The new consumer's quantity at \$25: Wing demands 4 cups at \$25, so the new consumer demands $\lfloor 4/2 \rfloor = 2$ cups.

Step 3 – New market quantity at \$25: $11 + 2 = 13$ cups.

Note that adding a consumer increases market demand (the market demand curve shifts rightward), even though nobody's individual demand has changed. Always sum quantities horizontally at a given price – never add prices together.

3 A

Handle simultaneous shifts by treating each curve separately, then combining.

Step 1 – Identify the shifts.

Lower production costs → supply increases (shifts right).

Stronger preference → demand increases (shifts right).

Step 2 – Effect on quantity. Both shifts raise quantity, so equilibrium quantity definitely rises. No extra information is needed.

Step 3 – Effect on price. The two shifts pull price in opposite directions:

- Demand up → pushes price up
- Supply up → pushes price down

Because the supply shift is larger, the downward pressure dominates, so equilibrium price falls.

Handy rule: when both curves shift in the same direction, the quantity effect is certain and the price effect depends on which shift is larger.

4 A

Step 1 – Derive the new market supply at \$12 by horizontal summation.

Total number of bakeries: $10 + 4 = 14$

Each supplies 9 loaves at \$12, so market quantity supplied is $14 \times 9 = 126$ loaves per day.

Step 2 – Compare with quantity demanded at \$12. Nothing has affected demand, so quantity demanded at \$12 is still 150 loaves.

Step 3 – Identify the market condition.

$$150 - 126 = 24$$

Quantity demanded exceeds quantity supplied, so there is a shortage of 24 loaves, which puts upward pressure on price.

Why market supply still decreased overall: more sellers pushes market supply right, but the higher flour cost pushes it left. Here the cost effect dominates, since supply at \$12 fell from 150 to 126 loaves.

The new equilibrium price will be above \$12 and the new equilibrium quantity below 150 loaves.

5 A

Consumer surplus = total willingness to pay – total amount actually paid.

Step 1: Find equilibrium. At $P = 20$, quantity demanded = quantity supplied = 60 units, so $P_e = 20$ and $Q_e = 60$.

Step 2: Read willingness to pay block by block. At \$30 only 20 units are demanded, so the first 20 units are worth \$30 each. The next 20 units (units 21–40) are worth \$25 each, and units 41–60 are worth \$20 each.

Step 3: Surplus per block = (willingness to pay – price paid) × units:

$$20 \times (30 - 20) = 200$$

$$20 \times (25 - 20) = 100$$

$$20 \times (20 - 20) = 0$$

Step 4: Total consumer surplus = $200 + 100 + 0 = 300$.

So the consumer surplus is \$300. Notice the last unit gives zero surplus because its marginal benefit just equals the price.

6 A

Key idea: Consumer surplus is the area under the demand curve above the price paid, measured over the units actually transacted.

Step 1: Read the diagram. Supply shifts leftward from S_0 to S_1 , so equilibrium moves from E_0 to E_1 : price rises from P_0 to P_1 and quantity falls from Q_0 to Q_1 .

Step 2: Apply this to consumer surplus. Buyers now pay a higher price on fewer units, so the triangle between the demand curve and the price shrinks from both sides – consumer surplus definitely falls.

Step 3: Total social surplus is consumer plus producer surplus measured over the transacted quantity. Because fewer mutually beneficial units are traded at the new equilibrium, total surplus is also smaller than before, even though the higher price benefits sellers on each unit sold.

Rule: With a unit tax on sellers, the new quantity is where the quantity demanded at the buyer's price equals the quantity supplied at the seller's price, and the two prices differ by the tax.

Step 1: Free-market equilibrium: at \$10, quantity demanded = quantity supplied = 80.

Step 2: Try a buyer price of \$11. Quantity demanded = 70. Sellers then keep $11 - 2 = 9$, and at \$9 quantity supplied = 70. They match, so after the tax $P_b = 11$, $P_s = 9$ and $Q = 70$.

Step 3: Compute each figure.

Tax revenue = $2 \times 70 = 140$

Sellers' revenue net of tax = $9 \times 70 = 630$

Buyers' expenditure: $10 \times 80 = 800 \rightarrow 11 \times 70 = 770$, a fall of \$30.

Buyers bear $(11 - 10) \times 70 = 70$ and sellers bear $(10 - 9) \times 70 = 70$.

So the correct statement is that sellers' revenue net of tax is \$630.

Rule: For a unit subsidy, the buyer's price falls and the seller's price rises, and the two changes add up to the subsidy. The less elastic side receives the larger share of the benefit.

Step 1: Split the \$6. Buyers' price falls by \$2, so buyers' benefit per unit is \$2. The remainder, $6 - 2 = 4$, is the rise in the price sellers receive, so producers receive \$4 per unit. Statement (2) is correct.

Step 2: Producers receive the larger share (\$4 vs \$2), so supply must be the less elastic side. Statement (1) is correct.

Step 3: A subsidy to producers lowers their effective cost per unit, so supply shifts rightward (downward), not leftward. Statement (3) is incorrect.

Hence (1) and (2) only.

Key idea: When an effective price ceiling is below the equilibrium price, the money price stays at the ceiling and the quantity transacted is limited by the quantity supplied at that ceiling price.

Step 1: The ceiling line stays fixed and remains effective after the shift, so the legal money price does not change.

Step 2: The supply curve has not moved, so the quantity supplied at the ceiling price is exactly the same as before. Since sellers still determine how much is available, the quantity transacted is unchanged.

Step 3: Demand at the ceiling price is now larger, while quantity supplied is the same, so the gap between quantity demanded and quantity supplied – the shortage – becomes bigger.

So the quantity transacted stays the same while the shortage widens, and competition through queueing or other non-price methods intensifies.

Rule: After a unit tax, the surplus enjoyed by market participants is consumer surplus (above the buyer's price, under demand) plus producer surplus (below the seller's price, above supply). Tax revenue goes to the government, and deadweight loss is surplus that nobody receives.

Step 1: The top shaded region, between the demand curve and the buyer's price P_b , is consumer surplus – Area A.

Step 2: The bottom shaded region, between the seller's price P_s and the supply curve, is producer surplus – Area B.

Step 3: The rectangle between P_b and P_s over the after-tax quantity is tax revenue (Area D), collected by the government, and the remaining triangle is deadweight loss (Area C) – neither belongs to buyers or sellers.

So buyers and sellers together keep Areas A and B.