Module 1 Review: Markets, Demand and Supply

Solutions manual and marking guidance (for learners checking their work, and for instructors).

O1: Analyse a market event: decide which curve shifts, in which direction, and find the new equilibrium (Lesson 1).

Q01 [Foundational · multiple choice] A storm destroys part of the mango harvest. Which curve shifts, and which way? (a) demand, left (b) demand, right (c) supply, left (d) supply, right

Answer: (c)

1. The storm changes what sellers can offer at each price.

Q02 [Foundational · true/false] True or false: after the storm, 'the demand for mangoes fell'.

Answer: False

1. Demand did not shift; the quantity demanded fell because the price rose (a movement along the curve).

Q03 [Core · numerical] A smaller storm cuts supply to Qs = -200 + 200P. Find the new equilibrium price and quantity.

Answer: $3.25, 450 kg

1. 1100 - 200P = -200 + 200P.
2. P = 1300/400 = 3.25; Q = 450.

Q04 [Core · numerical] A larger storm cuts supply to Qs = -400 + 200P. Find the new equilibrium.

Answer: $3.75, 350 kg

1. P = 1500/400 = 3.75; Q = 1100 - 200 x 3.75 = 350.

Q05 [Applied · numerical] Demand rises to Qd' = 1300 - 200P at the same time as the storm cuts supply to Qs' = -300 + 200P. Find the new equilibrium and say which change was certain in advance.

Answer: $4, 500 kg; the price rise was certain

1. Both shocks push the price up; they push the quantity in opposite directions.
2. 1300 - 200P = -300 + 200P gives P = 4, Q = 500.

Q06 [Applied · conceptual] Explain, using the correct vocabulary, what happened in the mango market after the storm.

Answer: Supply decreased (the supply curve shifted left); at the old price there was a shortage, so the price rose to $3.50; the quantity demanded fell along the unchanged demand curve to 400 kg.

1. Shift vs movement; shortage drives the price up.

O2: Use the price elasticity of demand and the total revenue test to predict what happens to sellers' revenue (Lesson 2).

Q07 [Foundational · true/false] True or false: when a good's price rises, sellers' total revenue always rises.

Answer: False

1. With elastic demand, revenue falls when the price rises.

Q08 [Core · numerical] The bus fare rises by 10% and the number of tickets sold falls by 5%. Find the elasticity and say what happens to revenue.

Answer: 0.5; revenue rises

1. 5 / 10 = 0.5 < 1: inelastic.
2. With inelastic demand, price and revenue move together.

Q09 [Core · numerical] After the 100 kg storm the mango price rises from $3 to $3.25 and the quantity falls from 500 to 450 kg. Find the midpoint elasticity and the change in revenue.

Answer: 1.32; revenue $1,500 -> $1,462.50

1. (50/475) / (0.25/3.125).
2. Elastic, so revenue falls.

Q10 [Applied · numerical] After the 300 kg storm the price rises from $3 to $3.75 and the quantity falls from 500 to 350 kg. Find the midpoint elasticity and the change in revenue.

Answer: 1.59; revenue $1,500 -> $1,312.50

1. (150/425) / (0.75/3.375).
2. Elastic, so revenue falls.

Q11 [Applied · conceptual] A farmers' leader says: 'A storm is good news for us: prices go up.' Using elasticity, explain when this is true and when it is false.

Answer: True only if demand is inelastic over the range of the price rise (revenue rises with price); false if demand is elastic, as in the mango storm, where revenue fell from $1,500 to $1,400. Individual farmers who lost their crop can lose even when total revenue rises.

1. Total revenue test; distribution across farmers.

Q12 [Advanced · critical thinking] Why might the same storm raise farmers' revenue in the long run but lower it in the short run, or the other way round? Explain using elasticity.

Answer: Elasticity changes with time: buyers find substitutes and sellers adjust over time. If demand becomes more elastic in the long run, a lasting price rise loses more buyers, so revenue is more likely to fall; if supply recovers, the price falls back. The answer depends on how elasticities change with time.

1. Time as a determinant of elasticity (Lesson 2).

O3: Measure the gains and losses of buyers and sellers with consumer, producer and total surplus (Lesson 3).

Q13 [Foundational · numerical] After the 200 kg storm (price $3.50, 400 kg), find consumer surplus.

Answer: $400

1. 1/2 x 400 x (5.50 - 3.50).

Q14 [Core · numerical] After the 200 kg storm, the new supply curve meets the price axis at $1.50. Find producer surplus and total surplus.

Answer: PS $400; total $800

1. 1/2 x 400 x (3.50 - 1.50) = 400.
2. 400 + 400 = 800.

Q15 [Core · numerical] By how much do buyers and sellers each lose from the 200 kg storm?

Answer: buyers $225; sellers $225

1. CS 625 -> 400; PS 625 -> 400.

Q16 [Applied · numerical] For the 100 kg storm (Qs = -200 + 200P), find consumer, producer and total surplus.

Answer: CS $506.25, PS $506.25, total $1,012.50

1. Equilibrium $3.25, 450 kg; supply meets the price axis at $1.
2. CS = 1/2 x 450 x (5.50 - 3.25); PS = 1/2 x 450 x (3.25 - 1).

Q17 [Applied · conceptual] Explain why the fall in total surplus after the storm is not a deadweight loss.

Answer: The storm raised the cost of supply; given the new costs the market trades the quantity where value to buyers equals cost to sellers, so no trade worth making is missed. The loss is a loss of productive capacity, not a market failure.

1. Compare with the ceiling, which does create a deadweight loss.

Q18 [Applied · numerical] Demand rises to Qd' = 1300 - 200P with the original supply. Find the new producer surplus.

Answer: $900

1. Equilibrium $3.50, 600 kg.
2. PS = 1/2 x 600 x (3.5 - 0.50) = 900.

O4: Evaluate a price ceiling or floor using the whole toolkit, separating evidence from value judgements (Lesson 4).

Q19 [Foundational · true/false] True or false: after the storm, a price floor of $3 would have no effect.

Answer: True

1. The equilibrium price is $3.50, above the floor.

Q20 [Core · numerical] After the storm, the council sets a ceiling of $3. Find the shortage, the quantity traded and the deadweight loss.

Answer: shortage 200 kg; traded 300 kg; DWL $50

1. Qd(3) = 500; Qs'(3) = 300.
2. DWL = 1/2 x 100 x (4 - 3).

Q21 [Applied · numerical] After the storm, the council considers a ceiling of $3.25 instead. Find the shortage and the deadweight loss.

Answer: shortage 100 kg; DWL $12.50

1. Qd = 450, Qs' = 350.
2. At 350 kg: value 3.75, cost 3.25; 1/2 x 50 x 0.5.

Q22 [Applied · numerical] After the storm, farmers ask for a floor of $4. Find the surplus of mangoes, the quantity sold and the deadweight loss.

Answer: surplus 200 kg; sold 300 kg; DWL $50

1. Qs' = 500, Qd = 300.
2. DWL = 1/2 x 100 x (4 - 3).

Q23 [Advanced · long answer] In about 250 words, advise the council whether to impose the $3 ceiling after the storm. Use all four tools, give numbers, and separate evidence from value judgements.

Answer: Marking points: supply shift and new equilibrium ($3.50, 400 kg); elasticity and revenue (1.44; $1,500 -> $1,400); surplus before/after (1,250 -> 800, not a DWL); ceiling binds: shortage 200, traded 300, CS +125, PS -175, DWL 50; side effects (queues, informal sales); value judgement made explicit; at least one alternative policy considered.

1. 1 mark each for the seven marking points, 1 for clarity (max 8).

Q24 [Advanced · critical thinking] Suggest one alternative to a price ceiling that could help low-income households after the storm, and compare it with the ceiling using the Module 1 tools.

Answer: Example: a temporary cash transfer or voucher for low-income households. It lets the price clear the market (no shortage, no deadweight loss from a control) while supporting those most affected; costs fall on taxpayers, and demand may rise slightly, raising the price a little. Any well-argued alternative with a fair comparison earns credit.

1. Compare shortage, deadweight loss, who pays, who benefits.

Marking scheme: Module 1 test (about 60 minutes, 35 marks)

• A1 (1): Any place or system where buyers and sellers meet to exchange something. | Examples: an online shop, a phone or video call between two firms, a ticket resale app. [bank item KN-UGR-ECO-C01-M01-T01-L01-Q01]

• A2 (1): (b) | Producers (suppliers) are the sellers; consumers are the buyers. [bank item KN-UGR-ECO-C01-M01-T01-L01-Q02]

• A3 (1): 33.3% | Change 200; average (700 + 500) / 2 = 600. 200 / 600 = 33.3%. [bank item KN-UGR-ECO-C01-M01-T02-L01-Q07]

• A4 (2): (a) | With elastic demand, price and revenue move in opposite directions. [bank item KN-UGR-ECO-C01-M01-T02-L01-Q20]

• A5 (1): $30 | 80 - 50 = 30. [bank item KN-UGR-ECO-C01-M01-T03-L01-Q07]

• A6 (2): $625 | Supply meets the price axis at $0.50. PS = 1/2 x 500 x 2.50 = 625. [bank item KN-UGR-ECO-C01-M01-T03-L01-Q16]

• A7 (1): (c) | The market price $3 is already below the legal maximum, so the ceiling does not bind. [bank item KN-UGR-ECO-C01-M01-T04-L01-Q02]

• A8 (2): CS $825, PS $225, DWL $200 | CS = 225 + 600; PS = 1/2 x 300 x 1.50. DWL = 1/2 x 200 x 2. [bank item KN-UGR-ECO-C01-M01-T04-L01-Q16]

• B9 (4): The price rises for certain; the change in quantity is uncertain. | Higher incomes shift demand right (price up, quantity up). The storm shifts supply left (price up, quantity down). Both raise the price; the quantity effects pull in opposite directions. [bank item KN-UGR-ECO-C01-M01-T01-L01-Q19]

• B10 (4): The claim is wrong: falling revenue after a price rise implies elastic demand, so passengers are quite responsive. | Price up, revenue down: the quantity fell by more than 10%. That is elastic demand (elasticity > 1). Possible reasons: substitutes such as cycling, cars, other routes. [bank item KN-UGR-ECO-C01-M01-T02-L01-Q21]

• B11 (4): lost $200; total $1,050 | At 300 kg: value $4, cost $2. Lost triangle = 1/2 x 200 x 2 = 200. Total = 1250 - 200 = 1050. [bank item KN-UGR-ECO-C01-M01-T03-L01-Q22]

• B12 (4): Transfer $300; buyers lose $100, sellers lose $100 | Transfer = 300 kg x $1. Each lost triangle = 1/2 x 200 x 1. [bank item KN-UGR-ECO-C01-M01-T04-L01-Q19]

• C13 (8): Marking points: correct diagram (binding ceiling, shortage, quantity traded at Qs, transfer and deadweight loss); tenants' gains (lower rent, security); predicted side effects (supply, quality, misallocation, informal payments); short run vs long run (elasticity); policy design and alternatives; evidence needed (supply changes, tenant outcomes over time); balanced conclusion that distinguishes evidence from values. | 1 mark each: diagram; transfer; deadweight loss; benefits; side effects; time dimension; evidence; balance (max 8). [bank item KN-UGR-ECO-C01-M01-T04-L01-Q28]

• Total 35 marks. Section A items: 1 mark (foundational) or 2 marks (core); Section B: 4 marks each (award method marks for correct working); Section C: 8 marks using the marking points given.

Marking scheme: Project: analyse a real market event with all four tools (individual, about 800 words)

• Correct identification of shifts with a labelled diagram: 4 marks

• Reasoned elasticity discussion and revenue implication: 3 marks

• Gainers and losers explained with surplus areas: 4 marks

• Balanced evaluation of a price control, separating evidence from values: 4 marks

• Real, checkable sources and clear writing: 3 marks (total 18)