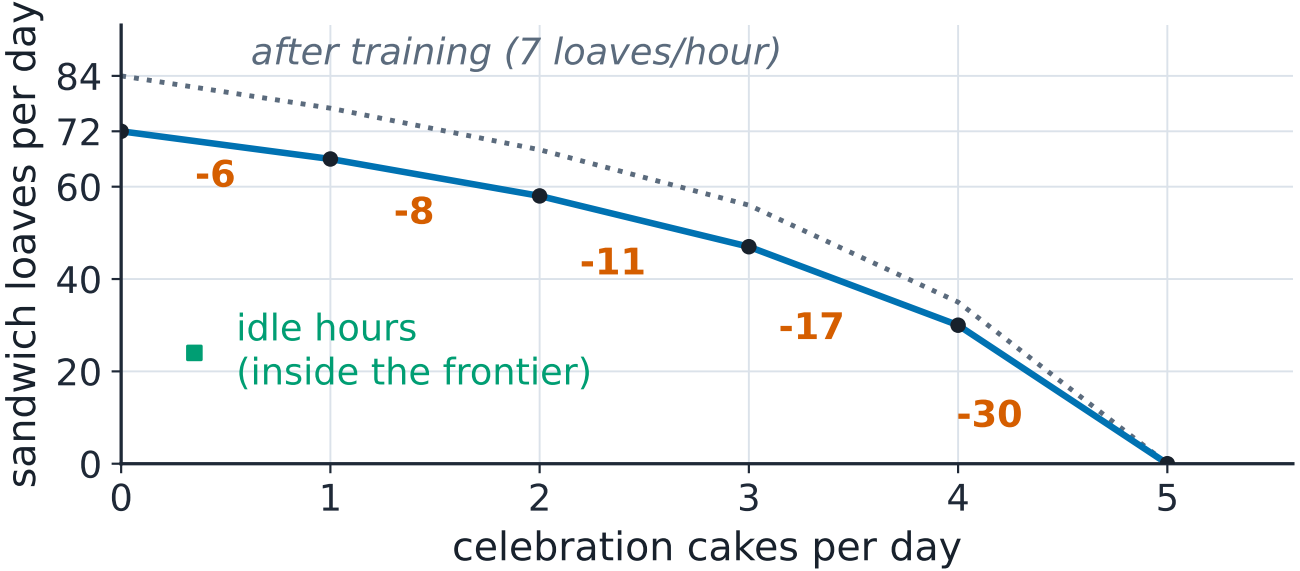
Exercise walk-through

3.1
Scarcity and opportunity cost

University Business

Scarcity and opportunity cost: the frontier

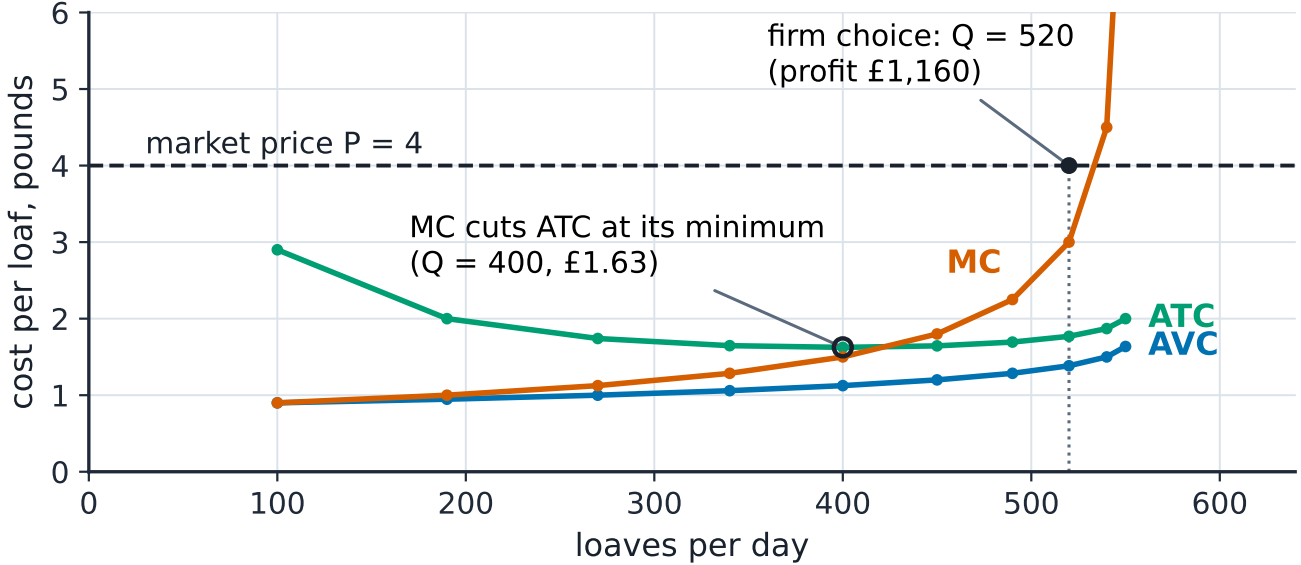
Twelve baker-hours: more cakes cost ever more loaves



Each extra cake costs more loaves: the bow is rising **opportunity cost**.

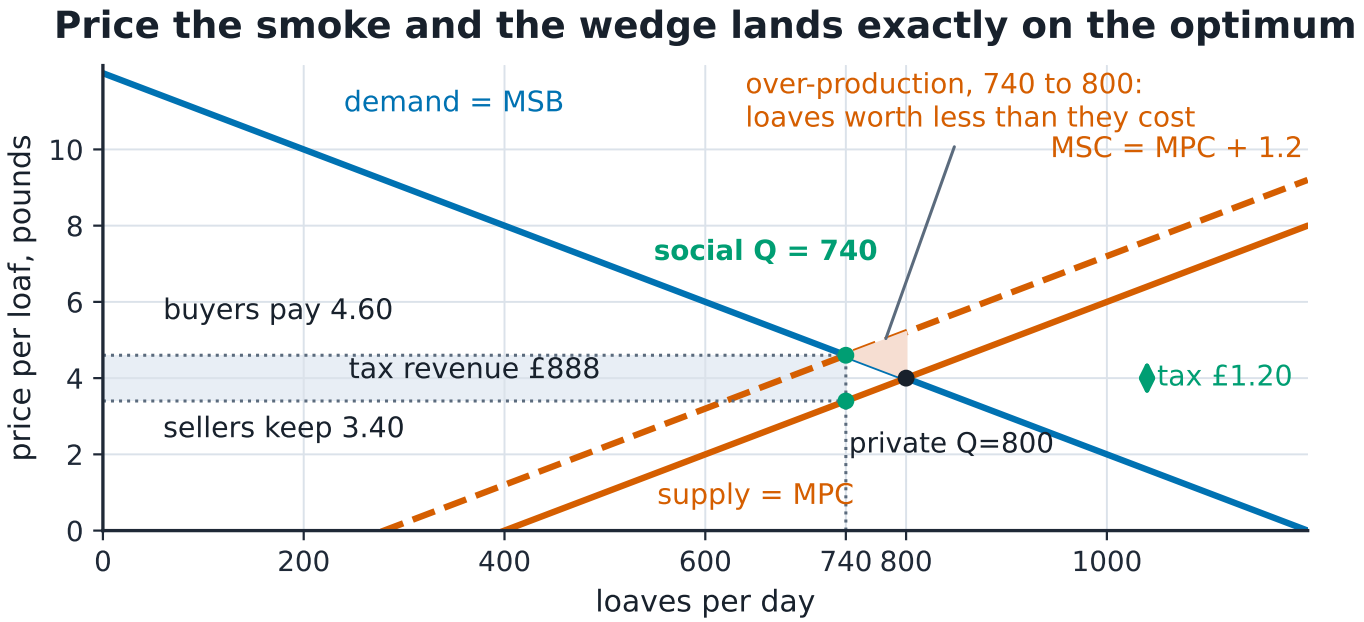
Production and costs: one table, every curve

Diminishing returns pull MC up; the averages follow the marginal



MC cuts ATC at its minimum, Q = 400; at P = 4 the firm makes 520.

Market failure: price the smoke



A 1.20 tax moves output from 800 to the social optimum of 740.

Exercises 2.1·2.2

2.1 A market garden's day splits between carrots and peas (both in crates). Its frontier is (0,60), (1,52), (2,42), (3,30), (4,16), (5,0). Compute the opportunity cost of the second and the fourth crate of peas, and state the pattern. [4]

2.2 Against that same frontier, classify each plan: (2, 40), (3, 35), (1, 52). For each, say on, inside or beyond, and why. [3]

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2.1

- Second crate: $60 - 52 =$ **8 carrots**.
- Fourth crate: $30 - 16 =$ **14 carrots**.
- The costs rise (8, 10, 12, 14, 16) – increasing opportunity cost.
- Each later crate displaces ground better suited to carrots.

2.2 Against that same frontier, classify each plan: (2, 40), (3, 35), (1, 52). For each, say on, inside or beyond, and why. [3]

2.2

- (2, 40): **inside** – the frontier offers 42 at 2 crates, so hours sit idle.
- (3, 35): **beyond** – 3 crates allow at most 30.
- (1, 52): **on** – exactly the frontier's second point.

Exercises 2.3·2.4

2.3 A grant lifts the garden to 70, 61, 50, 37, 22, 0. Compute the new opportunity cost of the third crate of peas, and compare it with the old one. [3]

2.4 On Nimbus's original frontier with loaves at £4: a celebration cake sells for £45 and uses £8 of ingredients. Taking the second cake costs 8 loaves. Should Nimbus bake it? Show the comparison. [4]

Exercises 2.3·2.4

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2.3

- New third-crate cost: $50 - 37 =$ **13 carrots**.
- Against the old cost of 12 carrots.
- Growth shifted the frontier out but scarcity remains – the third crate still costs carrots, and more than before.

2.4 On Nimbus's original frontier with loaves at £4: a celebration cake sells for £45 and uses £8 of ingredients. Taking the second cake costs 8 loaves. Should Nimbus bake it? Show the comparison. [4]

2.4

- Net benefit of the cake: $45 - 8 =$ £37.
- Opportunity cost: 8 loaves $\times$ £4 = £32.
- £37 $>$ £32, so **bake it**.
- The margin is £5.

Exercise 2.5

2.5 A customer offers £50 for Nimbus's THIRD cake; ingredients are £6 and loaves still £4. Compute the net benefit and the opportunity cost, state the decision, and explain what the equality means. [5]

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2.5

- Net benefit: $50 - 6 = £44$.
- Opportunity cost: the third cake costs $58 - 47 = 11$ loaves $\times$ £4 = **£44**.
- Benefit equals cost exactly: Nimbus is **indifferent**.
- The offer prices the cake at precisely its opportunity cost.
- That is the boundary of the bake / don't-bake rule.

Exercise 2.6

2.6 True or false, one line each: (a) flour already bought counts in a cake's opportunity cost; (b) a straight frontier shows increasing opportunity cost; (c) every point on the frontier is efficient. [3] *(2 marks for the set, 1 for reasons)*

Exercise 2.6

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2.6

- (a) False – the flour is sunk; the cost is the forgone loaves.
- (b) False – a straight frontier has constant cost.
- (c) True – all on-curve points use resources fully; choosing among them is preference, not efficiency.