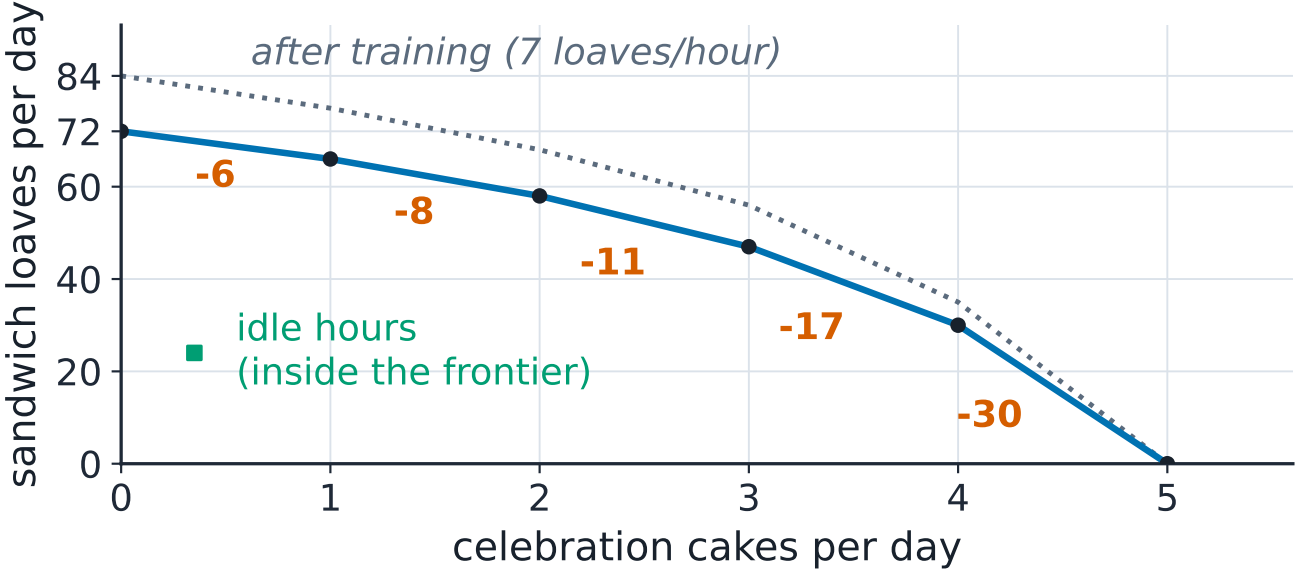
Exercise walk-through

# 3.5
# Market structures

University Business

# Scarcity and opportunity cost: the frontier

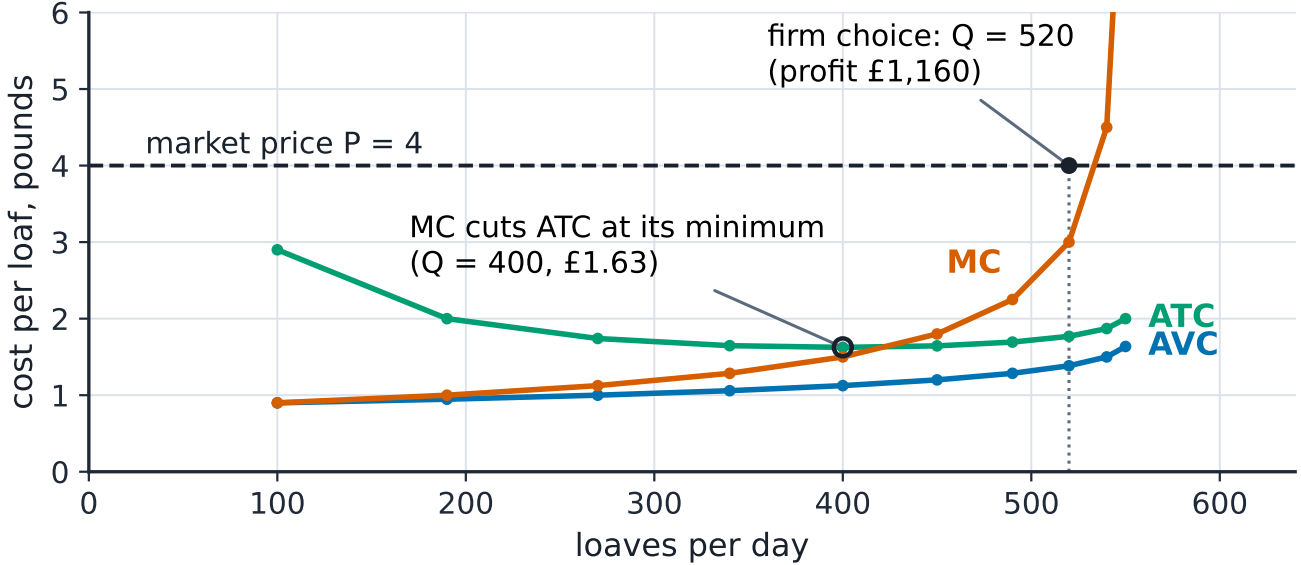
**Twelve baker-hours: more cakes cost ever more loaves**




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

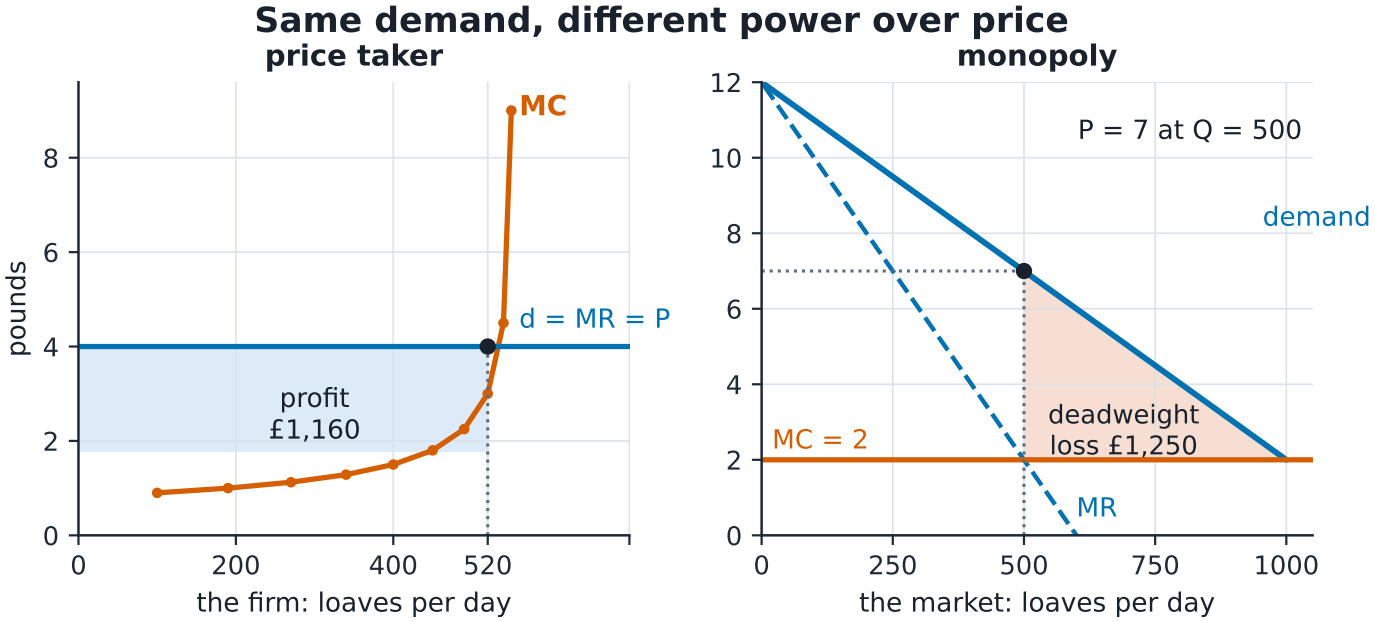
# Production and costs: one table, every curve

**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 structures: pricing by power




Price taker at 4 against a monopolist at 7 with a 1,250 **deadweight loss**.

# Exercise 2.1

**2.1** A software firm holds the only licence for a tool with demand $P = 20 - Q/50$ and a constant marginal cost of £4 per copy. Find its profit-maximising quantity and price, the Lerner index, and the deadweight loss against the $P = MC$ quantity. [5]

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**2.1**

- $MR = 20 - Q/25$. Set $MR = MC$: $20 - Q/25 = 4$.
- $Q = 400$ copies, $P = 20 - 8 = £16$.
- Lerner $(16 - 4)/16 = 0.75$.
- $P = MC$ at $20 - Q/50 = 4$ gives $Q = 800$.
- Deadweight loss $\frac{1}{2}(16 - 4)(800 - 400) = £2{,}400$.

# Exercise 2.2

**2.2** The coffee cart from sheet 3.4 (workers £60, machine £150, cups 60/110/150/180/200/ now sells in a perfectly competitive street at £2.50 a cup. How many cups does it sell, and what is its daily profit? [4]

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**2.2**

- Produce while $MC \le 2.50$: the fourth worker's cups cost $60/30 = £2.00$ ✓, the fifth's $60/20 = £3.00$ × – sell **180 cups**.
- Revenue $2.50 \times 180 = £450$.
- Cost $240 + 150 = £390$.
- Profit **£60**.

# Exercise 2.3

**2.3** Nimbus's sourdough district is monopolistically competitive. State the long-run equilibrium condition, explain why price stays ABOVE marginal cost there, and say what entry does to Nimbus's £1,160. [4]

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- Long run: $P = ATC$ with $P > MC$ – the demand curve ends tangent to ATC.
- Price stays above MC because the loaf is differentiated: cutting price to MC would throw away the markup that variety costs.
- Entry competes the £1,160 economic profit to zero.
- What survives is the markup that pays for standing out.

# Exercise 2.4

**2.4** Two bakeries each choose £4 or £5 for the festival weekend. Daily profits: both £4 → (£100, £100); both £5 → (£140, £140); one £5 and one £4 → the £4 bakery earns £170, the £5 bakery earns £60. Find each firm's best reply, the equilibrium, and compare it with what they would both prefer. [5]

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**2.4**

- If the other charges £4: £5 earns $60 < 100$, so reply £4.
- If the other charges £5: £5 earns $140 < 170$, so reply £4 again.
- £4 dominates; the equilibrium is **(£4, £4) at (£100, £100)**.
- Both would prefer (£5, £5) at (£140, £140), but independent pricing cannot reach it: each is tempted to undercut.
- That is the prisoners' dilemma shape of oligopoly.

# Exercise 2.5

**2.5** Classify each market: (a) dozens of identical baguette stalls; (b) the only water utility; (c) two flour mills for the whole city; (d) a street of distinct specialty bakeries with free entry. [2]

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**2.5**

- (a) perfect competition.
- (b) monopoly; (c) oligopoly; (d) monopolistic competition.