

Exercise walk-through

Types of cost, revenue and profit, short-run and long-run production ■ 7.5

eXercise

You must be able to

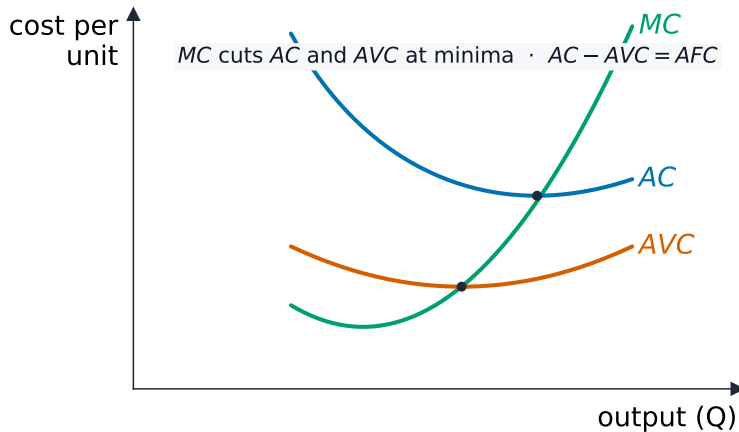
- define fixed, variable, average and marginal cost
- explain diminishing returns and economies of scale
- explain normal/supernormal profit and the profit-maximising rule ($MR = MC$)

Method — Short-run cost curves

- $AC = TC/Q$; $MC = \Delta TC/\Delta Q$. **Diminishing returns** 边际报酬递减: adding a variable factor to a fixed one eventually raises MC.
- **Economies of scale** 规模经济: long-run average cost falls as the firm grows; **diseconomies** raise it if too big.
- **Normal profit** 正常利润: just enough to stay (a cost); **supernormal** 超常利润: above normal.
- A firm maximises profit where **MR = MC**.

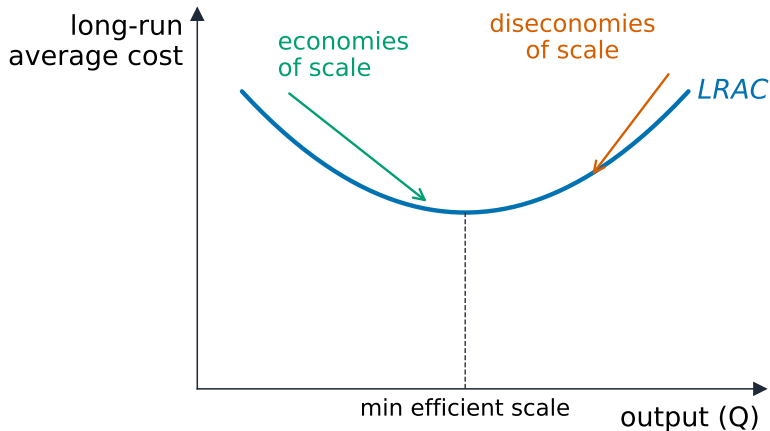
Answer shapes: an **Explain [up to 8]** answer may use a cost diagram (AO3); **Discuss [12]** adds a judgement (AO4).

Method — Short-run cost curves



MC, ATC and AVC are U-shaped; MC cuts the averages at their lowest points

Method — Short-run cost curves



Long-run average cost falls with economies of scale, reaches a minimum, then rises

Practice 2.1 ■ 2 marks

Define the term *marginal cost*.

Solution 2.1

Method: Short-run cost curves

Worked steps

the addition to total cost from producing one more unit of output ($\Delta TC/\Delta Q$) (2 for a clear definition; 1 for a partial idea).

Practice 2.2 ■ 2 marks

State the difference between *normal* and *supernormal* profit.

Solution 2.2

Method: Short-run cost curves

Worked steps

normal profit is just enough to keep the firm in the industry (it counts as a cost);
supernormal profit is any profit above normal (2 for a clear difference; 1 for a partial idea).

Practice 2.3 ■ 1 mark

State the output rule for profit maximisation.

Solution 2.3

Worked steps

produce where marginal revenue equals marginal cost ($MR = MC$) (1).

Exam-style 3.1 ■ 1 mark

A firm maximises profit at the output where:

- A** average cost is lowest
- B** marginal revenue equals marginal cost
- C** total revenue is highest
- D** price equals average cost

Solution 3.1

Method: Short-run cost curves

- A average cost is lowest
- B marginal revenue equals marginal cost** 
- C total revenue is highest
- D price equals average cost

Worked steps

B. Profit is maximised where $MR = MC$.

Exam-style 3.2 ■ 6 marks

Explain, using diminishing returns, why the marginal cost curve is U-shaped.

Solution 3.2

Method: Short-run cost curves

Worked steps

[6] AO1 1 + AO3 up to 5 — at low output, adding a variable factor to fixed factors raises productivity, so MC falls; beyond a point, diminishing returns set in (each extra worker adds less output) → the cost of each extra unit rises → MC rises → the curve is U-shaped.

Exam-style 3.3 ■ 12 marks

Discuss why a firm's long-run average cost may fall and then rise as output increases.

Solution 3.3

Method: Short-run cost curves

Worked steps

[12] AO1/AO2/AO3 up to 8 + AO4 up to 4. **Falls:** economies of scale — bulk buying, large machines, specialisation, financial economies lower average cost as the firm grows. **Rises:** diseconomies of scale — poor communication, control and coordination problems raise average cost if it grows too large. Judgement: there is an optimum size at minimum LRAC; whether a firm gains net economies depends on the industry and how well it is managed.