

4.2 Costs, scale of production and break-even analysis

Name: _____ Class: _____ Date: _____

Total: 23 marks

KEY WORDS fixed costs 固定成本 • break-even 盈亏平衡 • average cost 平均成本 • total cost 总成本
• revenue 收入

Objective

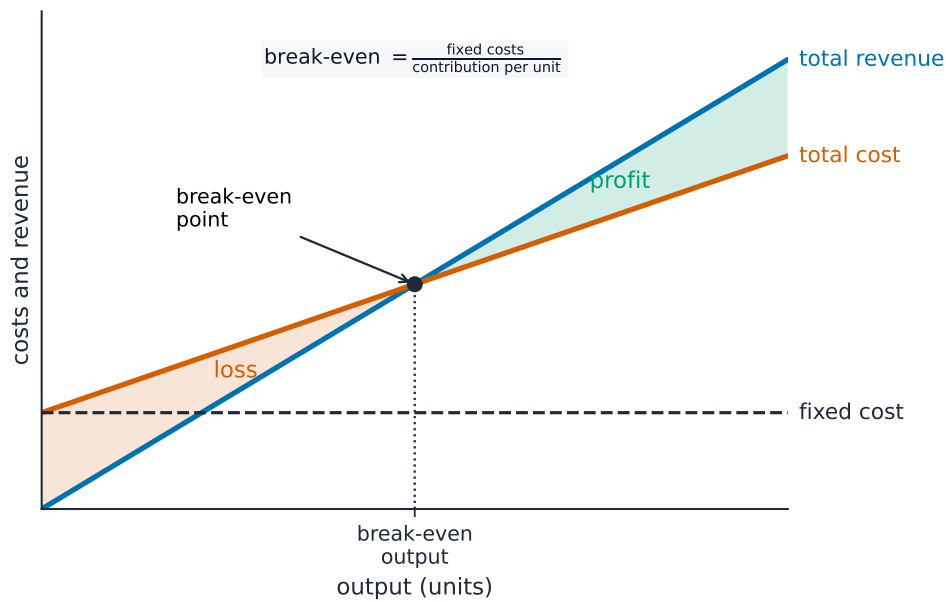
Build the skills to answer exam questions on **costs, scale of production and break-even analysis** 成本、生产规模与盈亏平衡 — **fixed and variable costs** 固定与可变成本, **revenue and profit** 收入与利润, and **break-even** 盈亏平衡.

You must be able to:

- calculate total cost, average cost, revenue and profit
- calculate the **break-even output** and the **margin of safety**
- explain the limits of break-even analysis

1 Worked examples

- Costs, profit and break-even

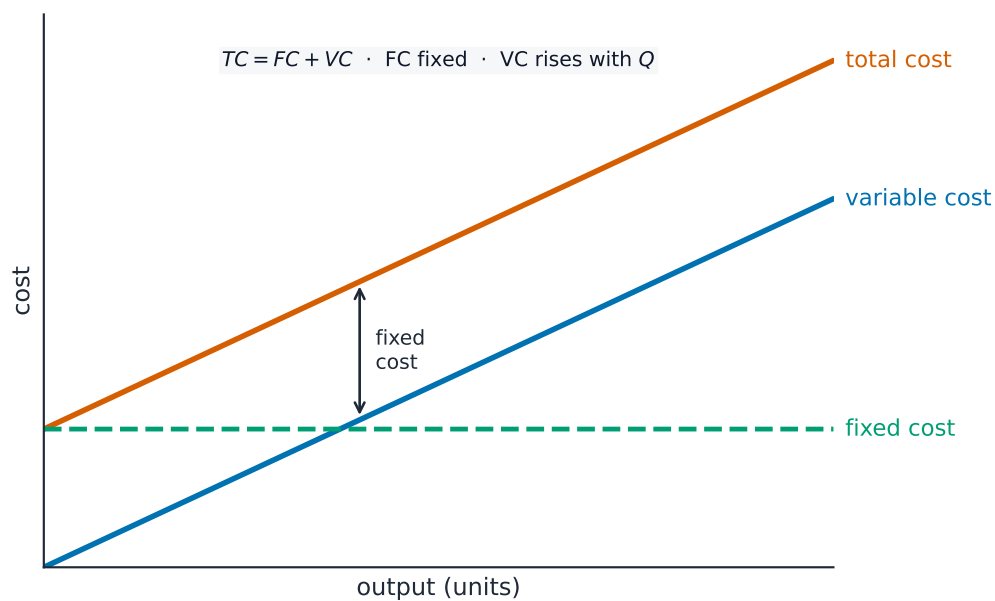


Left of break-even is loss; right of it is profit

$$\text{total cost} = \text{fixed} + \text{variable} \quad \text{profit} = \text{total revenue} - \text{total cost}$$

$$\text{break-even output} = \frac{\text{fixed costs}}{\text{price} - \text{variable cost per unit}}$$

- **Worked:** price \$15, variable cost \$5 → contribution \$10. Fixed costs \$8,000 → break-even = $\frac{8000}{10} = 800$ units.
- **Margin of safety** = actual output – break-even output (a big margin is safer).



The fixed and variable costs behind the break-even calculation

Answer shapes: K + App + An + Ev (a justified judgement, for “do you think” questions).

2 Practice

2.1 Define the term *fixed cost*.

[2]

2.2 A firm has fixed costs of \$4,000 and variable costs of \$3 per unit, and makes 1,000 units. Calculate the total cost.

[2]

2.3 State what the *break-even* point means.

[2]

3 Exam-style questions

3.1 A product sells for \$20 with a variable cost of \$8 per unit. Fixed costs are \$6,000.

(a) Calculate the contribution per unit. [1]

(b) Calculate the break-even output. [2]

(c) The firm makes 700 units. Calculate the margin of safety. [2]

3.2 Explain one benefit and one limitation of break-even analysis. [6]

3.3 Do you think break-even analysis is useful to a small business? Justify your answer. [6]

Solutions

IGCSE Business answers are marked by **level of response**: award **K** knowledge, **App** application, **An** analysis and **Ev** a justified judgement.

2.1 a cost that does not change with output, such as rent or salaries (2 for a clear definition; 1 for a partial idea).

2.2 $\$4,000 + (1,000 \times \$3) = \$7,000$ (2; award 1 for a correct method with the wrong figure).

2.3 the level of output where total revenue equals total cost, so the business makes no profit and no loss (2 for a clear definition; 1 for a partial idea).

3.1 (a) $\$20 - \$8 = \$12$ (1). (b) break-even = $\frac{6000}{12} = 500$ units (2; allow follow-through). (c) margin of safety = $700 - 500 = 200$ units (2; allow follow-through).

3.2 [6] K 1 + An up to 2 each side — *benefit*: it shows how many units must be sold to avoid a loss → helps set a sales target. *Limitation*: it assumes all output is sold and that price and costs stay the same → in reality these change, so it is only a guide. Maximum 3 each.

3.3 [6] Both sides + judgement. **For**: quick and simple, shows the break-even point and margin of safety, and supports a loan application — useful for a small firm at start-up. **Against**: its assumptions (all output sold; constant price and costs) are unrealistic. **Judgement (Ev)**: break-even is a helpful planning guide for a small business, but it should guide decisions, not make them alone — its value depends on how stable prices and costs are.