

Exercise walk-through

Costs ■ 5.4

eXercise

You must be able to

- classify costs and calculate contribution per unit
- calculate the **break-even output** and the **margin of safety**
- analyse the uses and limitations of break-even analysis

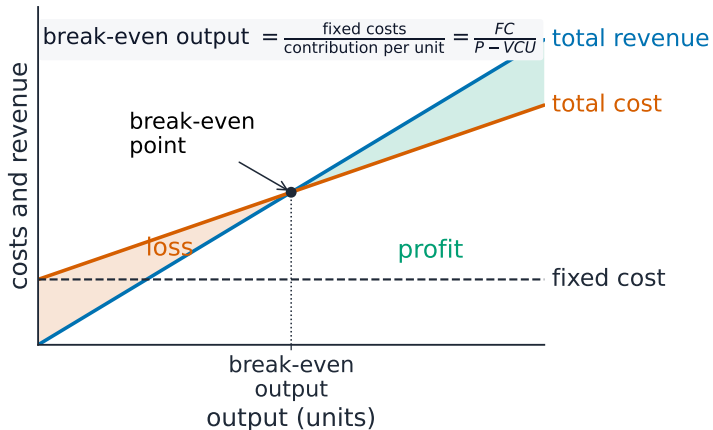
Method — Contribution and break-even

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

- **Worked:** sell at \$20, variable cost \$12 → contribution = \$8. Fixed costs \$40,000
→ break-even = $\frac{40000}{8} = 5,000$ units.
- **Margin of safety** = actual output – break-even output. At 6,000 units →
 $6000 - 5000 = 1,000$ units.
- **Fixed** costs don't change with output (rent); **variable** costs do (materials).

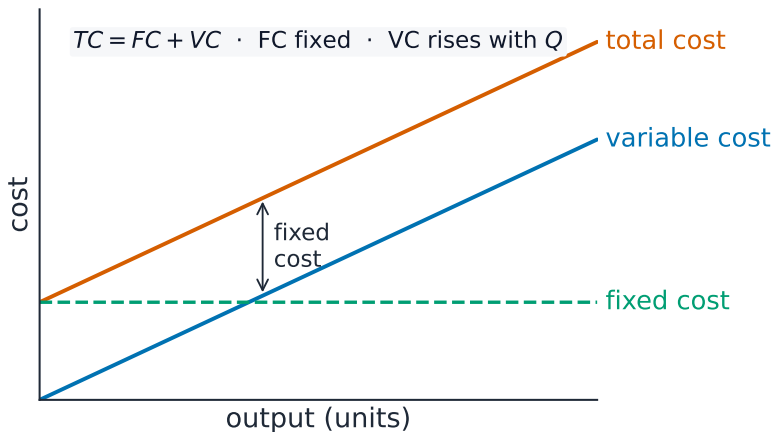
Answer shapes: AO1 + AO2 + AO3 (reasoning chain) + AO4 (a supported judgement *in context*).

Method — Contribution and break-even



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

Method — Contribution and break-even



Fixed cost stays flat; variable cost rises with output; total cost is the two added

Practice 2.1 ■ 2 marks

Define the term *fixed cost*.

Solution 2.1

Method: Contribution and break-even

Worked steps

a cost that does not change with the level of output, such as rent (2 for a clear definition; 1 for a partial idea).

Practice 2.2 ■ 2 marks

A product sells for \$18 and has a variable cost of \$11. Calculate the contribution per unit.

Solution 2.2

Method: Contribution and break-even

Worked steps

$\$18 - \$11 = \$7$ per unit (2; award 1 for a correct method with the wrong figure).

Practice 2.3 ■ 2 marks

State the difference between a *direct* and an *indirect* cost.

Solution 2.3

Worked steps

a direct cost can be clearly linked to one product (its materials); an indirect cost (overhead) cannot, e.g. a manager's salary (2 for a clear difference; 1 for a partial idea).

Exam-style 3.1 ■ 3 marks

Explain one limitation of break-even analysis.

Solution 3.1

Method: Contribution and break-even

Worked steps

[3] **AO1** 1 — state a limitation (assumes price and costs stay constant; assumes all output is sold; costs are not always neatly fixed/variable). **AO2** up to 2 — develop it, e.g. it assumes every unit made is sold → but unsold stock means real profit is lower than the chart shows → decisions can be misled (2 developed / 1 limited).

Exam-style 3.2 ■ 2 marks

A firm sells a product for \$25. The variable cost is \$15 per unit and fixed costs are \$50,000.

- (a) Calculate the contribution per unit.
- (b) Calculate the break-even output.
- (c) The firm produces 7,000 units. Calculate the margin of safety.

Solution 3.2

Method: Contribution and break-even

Worked steps

(a) $\$25 - \$15 = \$10$ contribution per unit (2). (b) break-even $= \frac{50000}{10} = 5,000$ units (2; allow follow-through from (a)). (c) margin of safety $= 7000 - 5000 = 2,000$ units (2; allow follow-through from (b)).

Exam-style 3.3 ■ 12 marks

Evaluate the usefulness of break-even analysis to a small business.

Solution 3.3

Method: Contribution and break-even

Worked steps

[12] **AO1** 2 / **AO2** 2 / **AO3** 2 / **AO4** up to 6. **Useful:** quick and simple, shows the break-even point and margin of safety, helps set output and price targets, supports a loan application. **Limited:** assumes constant price and costs and that all output is sold; real markets change; it ignores quality and competition. **Judgement:** a useful planning tool for a small firm, especially at start-up, but its assumptions are unrealistic, so it should guide decisions, not make them alone — its value depends on how stable the firm's prices and costs are.