Exercise walk-through

5.2
Location and break-even analysis

International Baccalaureate · IB Diploma · Business Management · HL

Operations management

- explain the role of operations and **value added**, and compare job, batch, **mass production** and **mass customisation**;
- analyse the factors that decide where a business locates, including outsourcing and reshoring;
- calculate contribution, break-even output, the margin of safety, target output and target price;
- at HL, explain lean production and quality management, plan stock and capacity, and evaluate crisis management, R&D and information systems.

Common errors

- Writing "**break-even** is where the business makes a profit"; at break-even, total revenue equals total costs and profit is zero.
- Using price instead of **contribution** in the break-even formula: divide fixed costs by contribution per unit (price minus variable cost).
- Rounding break-even output down; 1,291.7 repairs means 1,292 are needed to cover all costs.

Common errors (2)

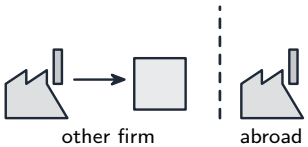
- Confusing the **margin of safety** (actual output minus **break-even** output) with profit.
- Choosing a location on cost alone; markets, labour skills, infrastructure, government rules and **quality** of life all count.
- Treating outsourcing and offshoring as the same thing: outsourcing uses another firm; offshoring moves work abroad, inside or outside the firm.

Exercises 2.1·2.2

2.1 Define **contribution per unit**. [2]

price − variable cost = ?

2.2 Distinguish between outsourcing and offshoring. [2]



Exercises 2.1·2.2

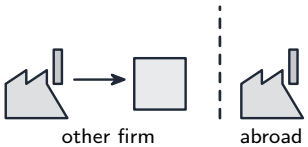
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price − variable cost = ?

2.1

selling price per unit minus variable cost per unit; the amount each unit adds towards paying fixed costs and then profit

2.2 Distinguish between outsourcing and offshoring. [2]

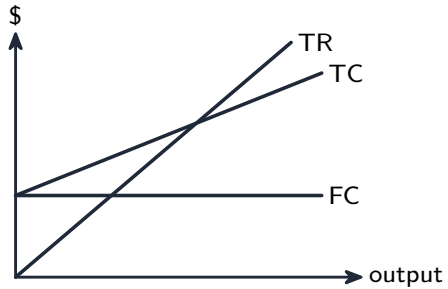


2.2

outsourcing: another firm is paid to carry out some of the work; offshoring: moving work or production to another country, either to the firm's own plant or to a subcontractor

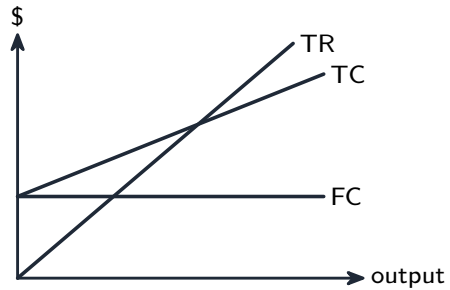
Exercise 2.3

2.3 A firm has fixed costs of \$24,000 a month. It sells each unit for \$20; the variable cost is \$12 per unit. It sells 4 000 units a month. Calculate the break-even output and the margin of safety. [4]



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2.3

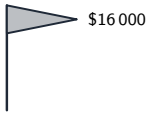
contribution $= 20 - 12 = \$8$; break-even $= 24\,000 \div 8 =$ **3 000** units; margin of safety $= 4\,000 - 3\,000 =$ **1 000** units

Exercises 2.4·2.5

2.4 Explain **two** qualitative factors a hotel chain should consider when choosing the location of a new hotel. [4]



2.5 For the firm in question 2.3, calculate the output needed for a profit of $16,000 a month. [2]



Exercises 2.4·2.5

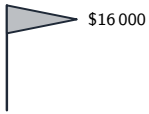
2.4 Explain **two** qualitative factors a hotel chain should consider when choosing the location of a new hotel. [4]



2.4

any two, explained: closeness to attractions, business districts or airports, which affects demand; safety and political stability of the area; quality of local infrastructure and transport links; availability of skilled hospitality staff / local culture and image of the area

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2.5

$(24\,000 + 16\,000) \div 8 = \mathbf{5\,000}$ units

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Exercise 3.1

3.1 Oakline Furniture must choose a site for a new factory. The data for two sites are shown.

Discuss which site Oakline should choose. [10]

	site A	site B
rent per year	$60 000	$110 000
average wage	$2 400/month	$3 000/month
distance to main customers	400 km	30 km
government grant	$150 000	none
skilled carpenters nearby	few	many

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3.1

award up to [10]: site A: lower rent and wages, so lower costs; a government grant reduces start-up costs; but far from main customers, so higher transport costs and slower delivery; few skilled carpenters, so training costs and possible quality problems; site B: close to customers and skilled workers; but higher rent and wages; quantitative comparison of annual costs from the table; qualitative factors such as infrastructure and image; judgement linked to Oakline's priorities, e.g. quality and delivery speed for furniture; conclusion supported by data

Exercise 3.2 (a)

3.2 The firm in question 2.3 plans to raise its price from \$20 to \$24, with no change in costs.

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

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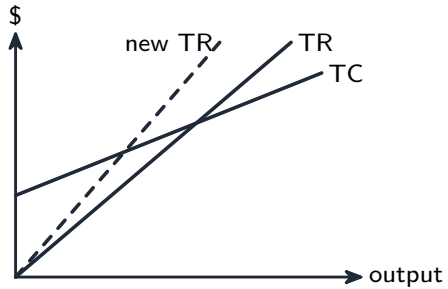
(a) Calculate the new break-even output. [2]

(a) contribution $= 24 - 12 = \$12$; $24\,000 \div 12 = \mathbf{2\,000}$ units

Exercise 3.2 (b)

3.2 The firm in question 2.3 plans to raise its price from \$20 to \$24, with no change in costs.

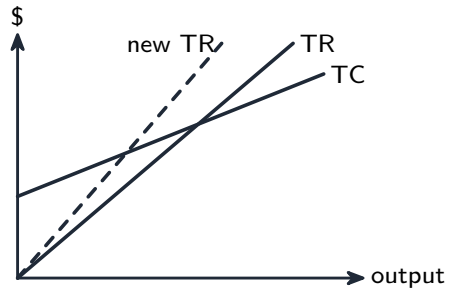
(b) Explain **two** limitations of using break-even analysis to make this decision. [4]



Exercise 3.2 (b)

3.2 The firm in question 2.3 plans to raise its price from $20 to $24, with no change in costs.

(b) Explain **two** limitations of using break-even analysis to make this decision. [4]



(b) any two, explained: assumes the same quantity will be sold at the higher price, but demand may fall; assumes costs stay the same at every output, e.g. no bulk discounts; assumes all output is sold with no stock left; ignores competitors' reactions