

Unit 3.3 Break-even analysis

Task 1: Complete the missing words

Break-even occurs when a firm's _____ revenue equals its _____ costs. The firm will make a _____ if it operates below its break-even level of output. By contrast, if it is able to generate more revenue than costs incurred in production then it will make a _____. Profit is the positive difference between sales revenues and the _____ of production, i.e. total revenues minus total costs.

To calculate break-even, it is common to use the _____ method by dividing the _____ costs by the difference between the product's selling price and its _____ costs of production. For example, if a manufacturer of wooden toy trains has fixed costs of \$3000 per month, with an average variable cost of \$10 and a selling price of \$25, then its break-even level of output would be _____ toy trains per month. Contribution analysis can help a business to identify products or projects that are relatively profitable and ones that might need more attention.

Task 2: True or false?

		True/False
a.	Cutting price will mean more sales and therefore a firm can reach its break-even point quicker.	
b.	As the price of a product increases, the break-even level of output will fall.	
c.	When variable costs rise, the break-even level of output will fall.	
d.	Profit can be calculated using the formula: Total contribution – Total Fixed Costs.	
e.	Unit contribution is calculated using the formula: Price – Unit variable costs.	
f.	The margin of safety can be negative.	
g.	When total costs rise, the margin of safety will fall.	
h.	If selling price is \$10, unit variable costs are \$4 and fixed costs are \$9000 then the break-even level of output is 1400 units.	
i.	A weakness of break-even analysis is that firms may have to, in reality, lower their prices to sell more.	
j.	The usefulness of a break-even analysis depends on the manager's accuracy in predicting costs, revenues and production levels.	

Task 3: Calculating break-even

Smash Racquets Co. makes a profit of \$10 000 on sales revenue of \$50 000. Its fixed costs are \$5000 and sales volume is 1000 units per month. Calculate the following for Smash Racquets:

a. Selling price

b. Variable cost per unit

c. Break-even level of output

d. The margin of safety if Smash Racquets Co. expects to sell 600 units per month

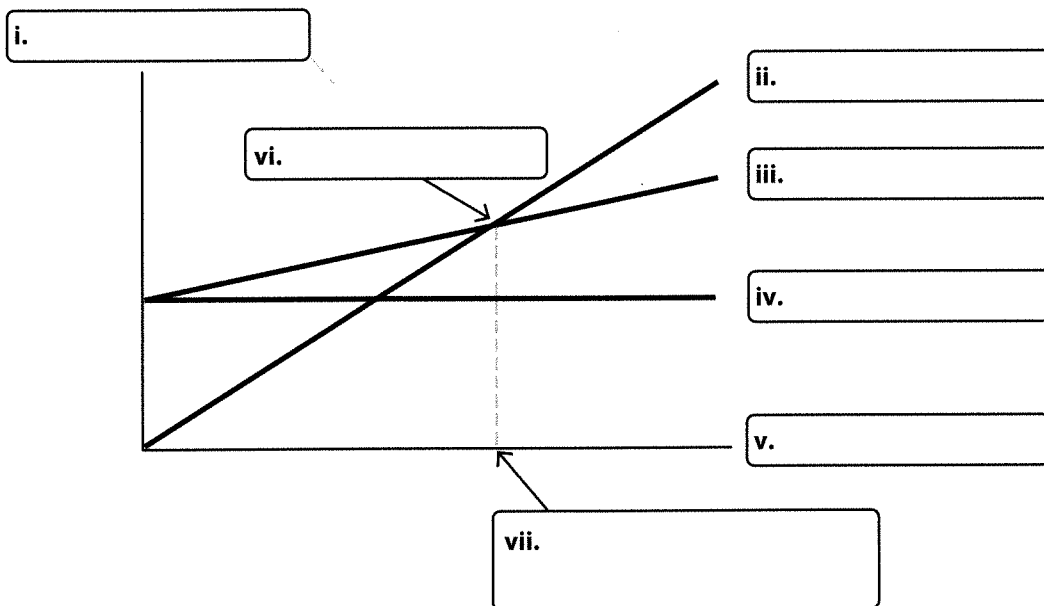
Questions 3e and 3f refer to the following information.

Fit-it Tyres Ltd. has fixed costs of \$100 000. Its average selling price is \$30 with unit variable costs of \$15. Use this information to calculate its:

e. Unit contribution

f. Break-even level of output

g. Complete the missing labels in the break-even chart below.



h. Explain why it is difficult to construct a break-even analysis for a multi-product firm.

i. Outline two possible causes of a fall in a firm's margin of safety.

Task 4: Multiple choice

1. Which of the following is not a direct cost of production for a car manufacturer?
 - A. Raw materials
 - B. Wages of production workers
 - C. Factory rental costs
 - D. Depreciation

2. Which of the following is a direct cost to a computer retailer?
 - A. Marketing costs
 - B. After-sales care
 - C. Rental costs
 - D. Depreciation of delivery vehicles

3. Contribution per unit is calculated by _____ price minus the _____ variable costs.
 - A. Average, Total
 - B. Total, Average
 - C. Selling, Average
 - D. Average, Total

4. Contribution per unit is calculated by using the formula
 - A. Price minus average fixed costs
 - B. Price minus average variable costs
 - C. Total revenue minus total costs
 - D. Total revenue equals total costs

5. Total contribution is the difference between
 - A. Total revenue and total variable costs
 - B. Total revenue and total costs
 - C. Price and total costs
 - D. Price and variable costs

6. Which of the following is a strength of break-even analysis?
 - A. It assumes that all the output is sold
 - B. It accounts for variances in actual sales and planned output
 - C. It assumes that all output is sold at one price
 - D. It accounts for both fixed and variable costs

7. A premium hotel can raise its revenues in a number of ways, except for:
- A. Reducing fixed costs
 - B. Reducing its prices
 - C. Reducing labour costs
 - D. Raising prices during peak periods
8. What can be worked out from calculating the price of a product and its variable costs?
- A. Total contribution
 - B. Unit contribution
 - C. Break-even point
 - D. Profit per unit
9. A firm has sales revenue of \$5 million from sales volume of 4000 units. Its average costs are \$600. Fixed costs are \$1 million. What is the total contribution for the firm?
- A. \$1.6 million
 - B. \$2.4 million
 - C. \$2.6 million
 - D. \$3.6 million
10. Which of the following costs will continually decline for a taxi driver as the mileage covered increases?
- A. Total variable costs
 - B. Total fixed costs
 - C. Average variable costs
 - D. Average fixed costs
11. Any output sold _____ the break-even point will generate a _____ for the business.
- A. Near, Loss
 - B. Above, Profit
 - C. Above, Loss
 - D. Below, Profit
12. If a business raises its price, which of the following is most likely to occur?
- A. Break-even output will fall
 - B. Break-even output will rise
 - C. Profits will fall
 - D. Profits will increase

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13. Which of the following statements applies to the margin of safety?
- A. It can be increased if a firm becomes more liquid
 - B. The firm produces at the break-even level of output so it is financially safe
 - C. The firm operates at a level higher than its break-even
 - D. The firm makes neither a profit nor a loss

Questions 14–17 refer to the following information.

Parc Oasis Ltd. has fixed costs of \$15 000 per month, with unit variable costs of \$200 and a selling price of \$500 per unit.

14. What is the total cost of production to Parc Oasis Ltd. if it produces 100 units each month?
- A. \$15 200
 - B. \$15 700
 - C. \$35 000
 - D. \$65 000
15. What is the average cost of producing 200 units per month?
- A. \$275
 - B. \$500
 - C. \$40 000
 - D. \$55 000
16. What is Parc Oasis Ltd.'s break-even level of output per month?
- A. 21
 - B. 30
 - C. 50
 - D. 75
17. If Parc Oasis Ltd. wanted to earn a profit of \$50 000 on the sale of 100 units per month, what selling price should be set by the firm?
- A. \$500
 - B. \$575
 - C. \$700
 - D. \$850

Questions 18–21 refer to the following information.

Jade Villa offers holiday accommodation at a beach resort. It has fixed costs of \$22 500 per time period. The variable cost per letting averages at \$250.

18. If the average villa is let out (hired) for \$1000, how many villas must the firm hire out to break-even?
- A. 23
 - B. 25
 - C. 30
 - D. 32
19. What is the value of Jade Villa's total revenue at the break-even point?
- A. \$22 500
 - B. \$25 000
 - C. \$28 500
 - D. \$30 000
20. If Jade Villa hires out 50 villas per time period, what is the average cost per letting?
- A. \$250
 - B. \$450
 - C. \$700
 - D. \$1000
21. If Jade Villa planned to earn a contribution of \$1000 per letting, what price should it charge, on average?
- A. \$1000
 - B. \$1250
 - C. \$2000
 - D. \$2275
22. Which of the following is not an assumption of break-even analysis?
- A. Variable costs per unit are constant
 - B. Economies of scale can only occur as the firm expands output
 - C. Productivity levels are held constant
 - D. Forecasts are only as good as the data used to make the predictions
23. A key limitation of break-even analysis is that
- A. It is a static model that does not cater well for the dynamic nature of business
 - B. It cannot allow for changes in fixed costs of production
 - C. Calculating the desired contribution at different sales levels is cumbersome
 - D. Average fixed costs are very difficult to calculate in reality

24. Which of the following is not a criticism of using break-even analysis?
- A. Costs are unlikely to be linear in reality
 - B. Unit costs are unlikely to remain constant across all levels of output
 - C. Prices are unlikely to be constant across all levels of sales
 - D. Multi-product firms cannot use break-even analysis
25. The concept of break-even analysis can help in the following business decisions, except for
- A. Special order decisions
 - B. Make-or-buy decisions
 - C. Payback period (investment appraisal)
 - D. Qualitative decision-making