

1.

Award: 10.00 points

Problems? [Adjust credit](#) for all students.

The Lakeshore Hotel's guest-days of occupancy and custodial supplies expense over the last seven months were:

| Month     | Guest-days of occupancy | Custodial supplies expense |
|-----------|-------------------------|----------------------------|
| March     | 4,000                   | £7,500                     |
| April     | 6,500                   | 8,250                      |
| May       | 8,000                   | 10,500                     |
| June      | 10,500                  | 12,000                     |
| July      | 12,000                  | 13,500                     |
| August    | 9,000                   | 10,750                     |
| September | 7,500                   | 9,750                      |

Guest-days is a measure of the overall activity at the hotel. For example, a guest stay at the hotel lasting for three days is counted as three guest-days.

**Required:**

1. Using the high-low method, estimate a cost formula for custodial supplies expense. **(Do not round variable cost element in the intermediate calculations. Round the first coefficient to the nearest whole number and the second coefficient to 2 decimal places.)**

|                     |         |                |        |                |
|---------------------|---------|----------------|--------|----------------|
| The cost formula is | £ 4,500 | per month plus | £ 0.75 | per guest-day. |
|---------------------|---------|----------------|--------|----------------|

2. Using the cost formula you derived above, what amount of custodial supplies expense would you expect to be incurred at an occupancy level of 11,000 guest-days? **(Do not round variable cost element in the intermediate calculations. Round your other intermediate calculations and answer to the nearest whole pound.)**

|                                      |          |
|--------------------------------------|----------|
| Amount of custodial supplies expense | £ 12,750 |
|--------------------------------------|----------|

**Explanation:**

1.

|                            | Guest-Days | Custodial Supplies Expense |
|----------------------------|------------|----------------------------|
| High activity level (July) | 12,000     | £13,500                    |
| Low activity level (March) | 4,000      | £ 7,500                    |
| Change                     | 8,000      | £ 6,000                    |

Variable cost element:

$$\frac{\text{Change in expense}}{\text{Change in activity}} = \frac{£6,000}{8,000} = £0.75/\text{guest} - \text{day}$$

Fixed cost element:

|                                                   |         |
|---------------------------------------------------|---------|
| Custodial supplies expense at high activity level | £13,500 |
| Less variable cost element: 12,000 × £0.75        | 9,000   |
| Total fixed cost                                  | £ 4,500 |

The cost formula is £4,500 per month plus £0.75 per guest-day or  $Y = £4,500 + £0.75 X$ .

2. Custodial supplies expense at an occupancy of 11,000 guest-days:

|                               |          |
|-------------------------------|----------|
| Variable cost: 11,000 × £0.75 | £ 8,250  |
| Fixed cost                    | £ 4,500  |
| Total cost                    | £ 12,750 |

### References

**Numeric  
Response**

Difficulty: Basic

2.

Award: 10.00 points

Question is flagged for manual grading.

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Magic Realm Ltd has developed a new fantasy board game. The company sold 17,000 games last year at a selling price of £17,000 per game. Fixed costs associated with the game total £195,500 per year, and variable costs are £6 per game. Production of the game is entrusted to a printing contractor. Variable costs consist mostly of payments to this contractor.

**Required:**

1. Prepare a statement of profit or loss for the game last year.

| Statement of Profit or Loss |           |
|-----------------------------|-----------|
|                             | Total     |
| Sales                       | £ 340,000 |
| Less variable expenses      | £ 102,000 |
| Contribution margin         | £ 238,000 |
| Less fixed expenses         | £ 195,500 |
| Net profit                  | £ 42,500  |

Compute the degree of operating leverage. **(Round your answer to 1 decimal place.)**

|                              |     |
|------------------------------|-----|
| Degree of operating leverage | 5.6 |
|------------------------------|-----|

2. Management is confident that the company can sell 20,400 games next year (an increase of 3,400 games, or 20 per cent, over last year).

(a) Compute the expected percentage increase in profit for next year. (Do not prepare a statement of profit or loss; use the degree of operating leverage to compute your answer.) **(Do not round intermediate calculations.)**

|                    |       |
|--------------------|-------|
| Increase in profit | 112 % |
|--------------------|-------|

(b) Compute the expected total pound profit for next year. (Do not prepare a statement of profit or loss; use the degree of operating leverage to compute your answer.) **(Do not round intermediate calculations.)**

|                    |        |
|--------------------|--------|
| Total pound profit | 90,100 |
|--------------------|--------|

**Explanation:**

|           |                                    |          |
|-----------|------------------------------------|----------|
| <b>1.</b> | <b>Statement of profit or loss</b> |          |
|           | Sales (17,000 games)               | £340,000 |
|           | Less variable expenses             | 102,000  |
|           | Contribution margin                | 238,000  |
|           | Less fixed expenses                | 195,500  |
|           | Net profit                         | 42,500   |

The degree of operating leverage would be:

Degree of operating leverage = Contribution margin / Profit

Degree of operating leverage = £238,000 / £42,500 = 5.6

2. (a) Sales of 20,400 games would represent a 20 per cent increase over last year's sales. Since the operating leverage is 5.6, net profit should increase by 5.6 times as much, or by 112% ( $5.6 \times 20\%$ ).

(b) The expected total pound amount of net profit for next year would be:

|                                                                      |         |
|----------------------------------------------------------------------|---------|
| Last year's net profit                                               | £42,500 |
| Expected increase in net profit next year ( $112\% \times £42,500$ ) | 47,600  |
| Total expected net profit                                            | 90,100  |

**References****Worksheet**

Difficulty: Basic

3.

Award: 10.00 points

Problems? [Adjust credit](#) for all students.

Lindon Company is the exclusive distributor for an automotive product. The product sells for £110 per unit and has a CM ratio of 30%. The company's fixed expenses are £541,200 per year.

**Required:**

1. What are the variable expenses per unit?

|                            |   |    |
|----------------------------|---|----|
| Variable expenses per unit | £ | 77 |
|----------------------------|---|----|

2. Using the equation method:

- (a) What is the break-even point in units? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                           |        |
|---------------------------|--------|
| Break-even point in units | 16,400 |
|---------------------------|--------|

What is the break-even point in sales pounds? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                                  |             |
|----------------------------------|-------------|
| Break-even point in sales pounds | £ 1,804,000 |
|----------------------------------|-------------|

- (b) What sales level in units is required to earn an annual profit of £580,800? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                |        |
|----------------|--------|
| Sales in units | 34,000 |
|----------------|--------|

What sales level in sales pounds is required to earn an annual profit of £580,800? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                 |             |
|-----------------|-------------|
| Sales in pounds | £ 3,740,000 |
|-----------------|-------------|

- (c) Assume that by using a more efficient shipper, the company is able to reduce its variable expenses by £11 per unit. What is the company's new break-even point in units? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                               |        |
|-------------------------------|--------|
| New break-even point in units | 12,300 |
|-------------------------------|--------|

What is the company's new break-even point in sales pounds? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                                      |             |
|--------------------------------------|-------------|
| New break-even point in sales pounds | £ 1,353,000 |
|--------------------------------------|-------------|

3. Using the unit contribution method:

- (a) What is the break-even point in units? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                           |        |
|---------------------------|--------|
| Break-even point in units | 16,400 |
|---------------------------|--------|

What is the break-even point in sales pounds? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                                  |             |
|----------------------------------|-------------|
| Break-even point in sales pounds | £ 1,804,000 |
|----------------------------------|-------------|

- (b) What sales level in units is required to earn an annual profit of £580,800? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

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What is the company's new break-even point in sales pounds? **(Do not round intermediate calculations. Round your answer to the nearest whole number.)**

|                                      |             |
|--------------------------------------|-------------|
| New break-even point in sales pounds | £ 1,353,000 |
|--------------------------------------|-------------|

### Explanation:

1. Variable expenses:  $£110 \times (100\% - 30\%) = £77$ .

|                        |      |      |
|------------------------|------|------|
| 2. (a) Selling price   | £110 | 100% |
| Less variable expenses | 77   | 70   |
| Contribution margin    | 33   | 30   |

Let Q = Break-even point in units.

Sales = Variable expenses + Fixed expenses + Profits

$£110Q = £77Q + £541,200 + £0$

$£33Q = £541,200$

$Q = £541,200 / £33$

$Q = 16,400$  units

In sales pounds:  $16,400 \text{ units} \times £110 = £1,804,000$

Alternative solution:

Let X = Break-even point in sales pounds.

$$X = 0.7X + £541,200 + £0$$

$$0.3X = £541,200$$

$$X = £541,200 / 0.3$$

$$X = £1,804,000$$

$$\text{In units: } £1,804,000 / £110 = 16,400 \text{ units}$$

**(b)**  $£110Q = £77Q + £541,200 + £580,800$

$$£33Q = £1,122,000$$

$$Q = £1,122,000 / £33$$

$$Q = 34,000 \text{ units}$$

$$\text{In sales pounds: } 34,000 \text{ units} \times £110 = £3,740,000$$

Alternative solution:

Let X = Break-even point in sales pounds.

$$X = 0.7X + £541,200 + £580,800$$

$$0.3X = £1,122,000$$

$$X = £1,122,000 / 0.3$$

$$X = £3,740,000$$

$$\text{In units: } £3,740,000 / £110 = 34,000 \text{ units}$$

**(c)** The company's new cost/revenue relationships will be:

|                                    |      |      |
|------------------------------------|------|------|
| Selling price                      | £110 | 100% |
| Less variable expenses (£77 – £11) | 66   | 60   |
| Contribution margin                | 44   | 40   |

$$£110Q = £66Q + £541,200 + £0$$

$$£44Q = £541,200$$

$$Q = £541,200 / £44$$

$$Q = 12,300 \text{ units}$$

$$\text{In sales pounds: } 12,300 \text{ units} \times £110 = £1,353,000$$

Alternative solution:

Let X = Break-even point in sales pounds.

$$X = 0.6X + £541,200 + £0$$

$$0.4X = £541,200$$

$$X = £541,200 / 0.4$$

$$X = £1,353,000$$

$$\text{In units: } £1,353,000 / £110 = 12,300 \text{ units}$$

**3. (a)** Break-even point = Fixed expenses / Unit contribution margin

$$\text{Break-even point} = £541,200 / £33 = 16,400 \text{ units}$$

$$\text{In sales pounds: } 16,400 \text{ units} \times £110 = £1,804,000$$

Alternative solution:

$$\text{Break-even point} = \text{Fixed expenses} / \text{CM ratio}$$

$$\text{Break-even point} = £541,200 / 0.3 = £1,804,000$$

$$\text{In units: } £1,804,000 / £110 = 16,400 \text{ units.}$$

**(b)** Target sales = (Fixed expenses + Target profit) / Unit contribution margin

$$\text{Target sales} = (£541,200 + £580,800) / £33 = 34,000 \text{ units}$$

$$\text{In sales pounds: } 34,000 \text{ units} \times £110 = £3,740,000$$

Alternative solution:

Target sales = (Fixed expenses + Target profit) / CM ratio

Target sales = (£541,200 + £580,800) / 0.3 = £3,740,000

In units: £3,740,000 / £110 = 34,000 units.

(c) Break-even point = Fixed expenses / Unit contribution margin

Break-even point = £541,200 / £44 = 12,300 units

In sales pounds: 12,300 units × £110 = £1,353,000

Alternative solution:

Break-even point = Fixed expenses / CM ratio

Break-even point = £541,200 / 0.4 = £1,353,000

In units: £1,353,000 / £110 = 12,300 units.

## References

### Worksheet

Difficulty: Basic

4.

Award: 10.00 points

Problems? [Adjust credit](#) for all students.

The Lakeshore Hotel's guest-days of occupancy and custodial supplies expense over the last seven months were:

| Month     | Guest-days of occupancy | Custodial supplies expense |
|-----------|-------------------------|----------------------------|
| March     | 4,000                   | £7,500                     |
| April     | 6,500                   | 8,250                      |
| May       | 8,000                   | 10,500                     |
| June      | 10,500                  | 12,000                     |
| July      | 12,000                  | 13,500                     |
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| September | 7,500                   | 9,750                      |

Guest-days is a measure of the overall activity at the hotel. For example, a guest stay at the hotel lasting for three days is counted as three guest-days.

**Required:**

- The data above should be plotted on a scattergraph and a line of best fit, or a regression line, fitted over the data by visual inspection. The version below represents the above data graphically. Use this for the remaining parts of this question.

- What is the approximate monthly fixed cost as per the scattergraph? **(Round your answer to the nearest whole pound.)**

|                                |   |                         |
|--------------------------------|---|-------------------------|
| Approximate monthly fixed cost | £ | 3,973 <sup>+/-100</sup> |
|--------------------------------|---|-------------------------|

What is the approximate variable cost per guest-day as per the scattergraph? **(Round fixed cost element to the nearest whole pound in the intermediate calculations. Round your answer to 2 decimal places.)**

|                                         |   |                        |
|-----------------------------------------|---|------------------------|
| Approximate variable cost per guest-day | £ | 0.77 <sup>+/-0.1</sup> |
|-----------------------------------------|---|------------------------|

- Scrutinize the points on the graph and explain why the high-low method would or would not yield an accurate cost formula in this situation.

**Explanation:**

|                                                                                       |        |
|---------------------------------------------------------------------------------------|--------|
| 2. Total costs at 7,500 guest-days per month [a point falling on the regression line] | £9,750 |
| Less fixed cost element (intersection of the Y axis)                                  | 3,973  |
| Variable cost element                                                                 | £5,777 |

$£5,777 \div 7,500 \text{ guest-days} = £0.77 \text{ per guest-day.}$

The cost formula is therefore £3,973 per month, plus £0.77 per guest-day or  $Y = £3,973 + £0.77X$ .

3. The high-low method would not provide an accurate cost formula in this situation, since a regression line cutting the high and low points would have too flat a slope and would be placed too high, cutting the cost axis at about £4,500 per month. That is, the high and low points are not representative of all of the data in this situation.

**References**

**Numeric  
Response**

Difficulty: Basic