

**Chapter 10 Solutions to long questions**

**A1 1C; 2D; 3B; 4C; 5A**

**A2 1D; 2C; 3A; 4B; 5C**

**A3 1A; 2B; 3C; 4D; 5B**

**A4. Hardware**

Find the high and low output and costs and calculate the differences between them:

	Output (laptops)	Total costs - £
High	7500	1,520,000
Low	3000	845,000
Difference	4500	675,000

1) As only the variable costs change with volume, the changes in costs for different levels of sales must all be variable. Therefore, the variable cost per light bulb is:

Increase in cost (£675,000) ÷ increase in units (4,500) = £150 per laptop

2) The total fixed cost can be calculated for high sales volume (750 laptops)

	£
Total cost	1,520,000
Variable costs (750 x £150)	<u>1,125,000</u>
Fixed costs	395,000

3) Break-even point =  $\frac{\text{Fixed costs}}{\text{contribution per laptop}}$  =  $\frac{\text{£395,000}}{\text{£225-£150}}$  =  
 5,267 laptops

4) To achieve a profit of £200,000, they need to sell:

$$\frac{\text{Fixed costs} + \text{profit}}{\text{Contribution per laptop}} = \frac{\pounds 395,000 + \pounds 200,000}{\pounds 75} = 7,934 \text{ laptops}$$

**A5 Clean Co Ltd**

**Cost–Volume–Profit Table**

Output (number of washing machines)	Variable Cost (£k)	Fixed Cost (£k)	Total Cost (£k)	Total Revenue (£k)	Profit (Loss) (£k)	Cost Per Unit (£)
2,500	1,250	250	1,500	2,000	500	600
3,000	1,500	250	1,750	2,400	650	583
3,500	1,750	250	2,000	2,800	800	571
4,000	2,000	250	2,250	3,200	950	562
4,500	2,250	250	2,500	3,600	1,100	555
5,000	2,500	250	2,750	4,000	1,250	550

This chart illustrates the principle that the more you produce, the cheaper the cost per unit becomes. This is due to the fixed costs being spread over more products. The fixed cost will fall as the volume increases. As the variable cost per unit remains constant, the total cost per unit will also decrease.

**A6. Lazydays**

1)	Sales price per parasol	\$500
	Variable costs per parasol	\$170
	Contribution per parasol	\$330
	Fixed costs per annum	\$1,650,000

Break-even point =  $\frac{\$1,650,000}{\$330} = 5,000$  parasols

2) Number of parasols at budgeted profit level:

$\frac{\$1,650,000 + £396,000}{\$330} = 6,200$  parasols

3)

Strategy	Number of parasols	Selling price per parasol	Contribution per parasol	Total
		\$	\$	\$k
A	6,510 (6200 x 1.05)	490	320	
	2,083.2			
B	6,665	475	305	
	2,032.8			

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C	6,820	462.50	292.5
	1,994.85		

The contribution will be maximised by reducing the selling price by 2%

### A7. Lounge Ltd

£	
1. Sales price	600.00
Variable cost per sofa (36,000÷300)	<u>120.00</u>
Contribution	<u>480.00</u>

$$\text{Break-even point} = \frac{\pounds 86,000}{480} = 180 \text{ sofas}$$

£	
2. Sales (600 x £300)	180,000
Variable cost	<u>36,000</u>
Contribution	144,000
Fixed costs	<u>86,000</u>
Profit	<u>58,000</u>

3. Sales price @ £550	550.00
Variable cost	<u>120.00</u>
Contribution	<u>430.00</u>

Number of sofas to be sold to make a target profit of £58,000

$$= \frac{\pounds 86,000 + \pounds 58,000}{\pounds 430} = 335 \text{ sofas}$$

4. Price increase £600 x 1.1 = £660 per sofa

$$\pounds 660 - \pounds 120 = \pounds 540 \text{ contribution}$$

$$\frac{86,000 + 58,000}{540} = 267 \text{ sofas would need to be sold to achieve the same profit}$$

### **A8. Break-even analysis**

Break-even analysis is based on a few key assumptions, many of which might apply to situations faced by businesses.

It assumes that costs can be divided clearly into fixed and variable costs. This is often not the case. For example, direct labour costs may be in practice a fixed costs in the short term of the factory workers have been employed regardless of production levels.

Break-even assumes that variable costs may vary directly with volume within the relevant range. This assumes that the analysis only applies to a short period of time such as a year. It also assumes that there is a linear relationships between costs and volume. This may not be the case. For example supervisor costs may increase in steps.

In the long run, all fixed costs may vary as decisions can be made to change the fixed costs of a business. For example, management can decide to close a factory saving rent and utility 'fixed' costs.

It assumes that the selling prices remains constant throughout the relevant range. In a highly competitive markets, this is unlikely to happen as businesses respond to pricing strategies of their competitors.