

Accounting Units 1 & 2

Chapter 5 Price-setting strategies

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Chapter 5 Price-setting strategies — 5A Pricing and profit; pricing methods and quotes

Theory

Before a business can record a single sale it must answer a deceptively simple question: **what price will we charge?** The **selling price** is the amount a customer pays for a good or a service. It is one of the most important decisions a business owner makes, because price is the link between the effort of running the business and the **profit** it earns. This section looks at the **relationship between pricing and profit**, the three main **price-setting methods** — the **recommended retail price (RRP)**, **cost-based pricing** and **market-based pricing** — and how a service or trade business prepares a **quote** for a one-off job.

Pricing and profit. Profit is what remains after expenses are deducted from revenue, and price drives both sides of that relationship. For each unit sold:

$$\text{Profit per unit} = \text{selling price (excl. GST)} - \text{cost per unit}$$

and, across a period,

$$\text{Profit} = (\text{selling price} - \text{cost per unit}) \times \text{units sold}$$

Two forces pull against each other. A **higher price** earns more profit **on every unit sold**, but it usually **reduces the number of units** customers will buy; a **lower price** wins more sales but earns **less on each one**. The owner's task is to choose the price that produces the **greatest total profit**, not simply the highest price or the highest volume. A price that does not even cover the **cost** of providing the good or service produces a loss on every sale, so the **cost of the product is the floor below which price cannot fall** if the business is to survive.

GST is not revenue. Retail prices displayed to consumers are **GST-inclusive**, but the 10% GST is **collected on behalf of the Australian Taxation Office** — it is neither revenue nor profit to the business. For that reason, **mark-ups, margins and profit are always calculated on GST-exclusive amounts**, and the GST is added on top at the end. The GST inside any GST-inclusive amount is an **exact fraction** — **one-eleventh** (because \$1.10 including GST is \$1.00 plus 10 cents, and $10 \div 110 = 1/11$):

$$\text{GST} = \text{GST-inclusive price} \div 11 \quad \text{GST-exclusive price} = \text{GST-inclusive price} - \text{GST}$$

Price-setting method 1 — the recommended retail price (RRP). The **RRP** is the selling price **suggested by the manufacturer or wholesaler** who supplies the product. The retailer may sell at the RRP or discount from it. Selling at the RRP is **simple** and keeps a product's price **consistent across all the stores** that stock it, which customers come to expect. Its limitation is that the RRP is set by the supplier, not by the retailer, so it **may not suit an individual business's own cost structure or local market** — the retailer's margin is simply whatever gap exists between the price it pays and the **GST-exclusive** amount inside the RRP. *Illustration:* a supplier recommends an RRP of \$99 (GST-inclusive) for a bike helmet it wholesales to retailers at \$50 (excl. GST). The GST in the RRP is $\$99 \div 11 = \9 , so the GST-exclusive selling price is \$90 and the retailer's profit per helmet is $\$90 - \$50 = \$40$.

Price-setting method 2 — cost-based (cost-plus) pricing. Here the business starts with the **cost** of the product and **adds a mark-up** — a set percentage (or dollar amount) — to arrive at the selling price:

$$\text{Selling price (excl. GST)} = \text{cost} \times (1 + \text{mark-up \%}) \quad \text{Profit per unit} = \text{selling price} - \text{cost}$$

Its great advantage is certainty: **every sale is guaranteed to cover its cost and add a known margin**, and the price is quick to calculate. Its weakness is that it looks **inward at cost and ignores the market** — it takes no account of what customers are willing to pay or what competitors charge, so a cost-plus price can end up **above the market** (and win no sales) or **below it** (leaving profit on the table). *Illustration:* a cordless drill costs a retailer \$80 (excl. GST); a 50% mark-up gives a selling price of $\$80 \times 1.5 = \120 (excl. GST), a profit of \$40 per drill. Adding 10% GST (\$12) makes the price the customer pays \$132.

Price-setting method 3 — market-based pricing. Here the business sets its price by reference to the **market** — chiefly **what competitors charge** and **what customers are prepared to pay**. It keeps the business **competitive** and responsive to demand, which matters most where similar products are widely available. Its limitation is that the market price is **not guaranteed to cover the business's costs**, so the owner must **check that the chosen price still leaves an**

acceptable margin; it also relies on up-to-date market research. *Illustration:* competitors sell a comparable cordless drill for \$110 (excl. GST). Matching that price on a drill that costs \$80 leaves a profit of $\$110 - \$80 = \$30$ per drill — acceptable, and it keeps the business in line with the market.

In practice, most businesses **blend** the methods: they calculate a cost-based price as a floor, then check it against the market before committing to a final price.

Preparing a quote for a job. A business that does **custom or one-off jobs** — a landscaper, electrician, caterer, carpenter — cannot rely on a shelf price. Instead it prepares a **quote**: a document given to the customer **before** the work begins, stating the price the business will charge. A quote is **built up** from the resources the job will consume:

- **Materials** — the cost of the materials or inventory the job will use (at GST-exclusive cost).
- **Labour** — the hours the job will take $\times$ the hourly labour rate.
- **Overhead** — a fair share of the business's **indirect running costs** (rent, insurance, tools, administration), commonly recovered at a set amount **per labour hour** or as a **percentage of labour**.

These three add to the **total cost** of the job. To that the business adds a **margin** (its mark-up) to produce the **price (excl. GST)** — the revenue the job will earn — and finally adds **10% GST** to give the **total quoted price** the customer pays:

Total cost = materials + labour + overhead

Price (excl. GST) = total cost + margin

Total quoted price = price (excl. GST) + GST Profit on the job = margin

Worked model. Kingfisher Landscapes quotes to install a raised garden bed. The job needs \$240 of materials, 8 hours of labour at \$50 per hour, and overhead recovered at \$20 per labour hour; the business adds a margin of 25% of total cost, then GST.

Quote — Kingfisher Landscapes (raised garden bed)

Kingfisher Landscapes	\$
Materials	240
Labour (8 hrs @ \$50)	400
Overhead (8 hrs @ \$20)	160
Total cost	800
Margin (25% of cost)	200
Price (excl. GST)	1 000
GST (10%)	100
Total quoted price	1 100

The customer pays \$1 100 (of which \$100 is GST owed to the ATO), and the business expects a **profit of \$200** — the margin — provided its estimate of materials, hours and overhead is accurate.

Ethical considerations. Pricing and quoting decisions are **ethical** as well as commercial. A quote is a promise, and an owner has a duty to prepare it **honestly**: to state the materials and labour hours the job genuinely requires, not to **inflate the quantities or hours** to disguise a higher charge, and to **honour the quoted price** once the customer has accepted it, absorbing a small cost over-run rather than springing surprise charges. Describing an everyday price as a “one-day-only special”, or quietly padding the materials line, misleads the customer and, because those same figures flow into the accounting records, distorts the business's reported results as well. Fair, transparent pricing — and resisting the temptation to **price-gouge** customers who have little choice — protects the business's **reputation** and the **long-term customer relationships** on which repeat profit depends. Charging a price that earns a reasonable profit is entirely proper; deceiving a customer about how that price was reached is not.

Worked examples (scaffolded)

Example 1 — selecting a pricing method: cost-based versus RRP

Summit Cycles buys a *Trailhead* bike pump for \$24 (excl. GST). It is deciding between **cost-based pricing** with a 75% mark-up, or selling at the supplier's **RRP of \$52.80 (GST-inclusive)**. Compare the selling price and profit per pump under each method.

Working	Comment
Cost-based: selling price (excl. GST) = $\$24 \times 1.75 = \42 .	Mark-up is added to cost: $\$24 \times (1 + 0.75)$. Cost-based pricing always starts from cost.
Profit per pump (cost-based) = $\$42 - \$24 = \$18$.	Profit per unit = selling price – cost.
RRP: the \$52.80 is GST-inclusive, so $\text{GST} = \$52.80 \div 11 = \4.80 and the GST-exclusive price = \$48 .	GST inside a GST-inclusive amount is exactly one-eleventh; the business's revenue is the \$48 excl. component.
Profit per pump (RRP) = $\$48 - \$24 = \$24$.	Same cost, a higher selling price, so a higher margin.
The RRP gives the higher profit per unit (\$24 vs \$18).	Selling at the RRP earns \$6 more per pump than a 75% cost-based mark-up.

Comparison — Summit Cycles

Per pump	Cost-based (75%)	RRP
Selling price (excl. GST)	42	48
Cost price	24	24
Profit per unit	18	24

Example 2 — preparing a quote (materials + labour + overhead + margin + GST)

Brightspark Electrical quotes to install downlights in a home office. The job needs \$200 of materials, 6 hours of labour at \$55 per hour, and overhead recovered at \$20 per labour hour. Brightspark adds a margin of 20% of total cost, then GST. Prepare the quote and state the profit on the job.

Working	Comment
Materials \$200; labour = $6 \times \$55 = \330 ; overhead = $6 \times \$20 = \120 .	Labour = hours $\times$ rate; overhead is recovered per labour hour.
Total cost = $\$200 + \$330 + \$120 = \650 .	The three inputs add to the cost of doing the job.
Margin = $20\% \times \$650 = \130 ; price (excl. GST) = $\$650 + \$130 = \$780$.	The margin is the profit the business builds into the price.
GST = $10\% \times \$780 = \78 ; total quoted price = $\$780 + \$78 = \$858$.	GST is added to the excl.-GST price; $\$858 \div 11 = \78 confirms it.
Profit on the job = \$130 (the margin).	Materials, labour and overhead are recovered by the price; the margin is the profit.

Quote — Brightspark Electrical (downlight installation)

Brightspark Electrical	\$
Materials	200
Labour (6 hrs @ \$55)	330
Overhead (6 hrs @ \$20)	120
Total cost	650
Margin (20% of cost)	130
Price (excl. GST)	780
GST (10%)	78
Total quoted price	858

Worked examples (unscaffolded)

Example 3 — a market-based pricing decision with a margin check

Coastal Coffee Roasters can produce a 1 kg bag of its house blend for \$20 (excl. GST). A market survey shows competitors sell comparable bags for \$30 (excl. GST). The owner will only proceed if each bag earns at least \$8 profit. Should the business adopt the market price, and what GST-inclusive shelf price would result?

At the market price the profit per bag is $\$30 - \$20 = \$10$, which exceeds the owner's \$8 minimum, so the market-based price is acceptable and keeps the roaster in line with competitors. The \$10 profit is a mark-up of $\$10 \div \$20 = 50\%$ on cost. Adding 10% GST (\$3) gives a shelf price of \$33.

∴ Coastal Coffee Roasters should price at \$30 (excl. GST) — a GST-inclusive shelf price of \$33 — earning \$10 profit per bag.

Example 4 — a quote with overhead recovered as a percentage of labour

Ironbark Carpentry quotes to build a timber deck. The job needs \$1 200 of materials and 40 hours of labour at \$48 per hour; overhead is recovered at **25% of the labour cost**. Ironbark adds a margin of 15% of total cost, then GST. Prepare the quote and state the total quoted price and the profit on the job.

Labour = $40 \times \$48 = \$1\,920$; overhead = $25\% \times \$1\,920 = \480 ; total cost = $\$1\,200 + \$1\,920 + \$480 = \$3\,600$. Margin = $15\% \times \$3\,600 = \540 , so the price (excl. GST) = \$4 140; GST = \$414; total quoted price = \$4 554 (and $\$4\,554 \div 1.1 = \$4\,140$ confirms the GST).

Quote — Ironbark Carpentry (timber deck)

Ironbark Carpentry	\$
Materials	1 200
Labour (40 hrs @ \$48)	1 920
Overhead (25% of labour)	480
Total cost	3 600
Margin (15% of cost)	540
Price (excl. GST)	4 140
GST (10%)	414
Total quoted price	4 554

∴ the total quoted price is \$4 554 and the profit on the job is \$540.

Practice questions — scaffolded

Question 1

Harbour Homewares buys a ceramic vase for \$30 (excl. GST) and prices it using **cost-based pricing** with a 60% mark-up.

- Calculate the selling price (excl. GST).
- Calculate the profit per vase and the GST that would be added to the selling price.
- Explain one advantage of cost-based pricing for this business.

Question 2

Peak Sports can sell a tennis racquet at the supplier's **RRP of \$187 (GST-inclusive)**. It buys the racquet for \$95 (excl. GST).

- Calculate the GST included in the RRP and the GST-exclusive selling price.
- Calculate the profit per racquet.

- c. State one advantage and one disadvantage of selling at the RRP.

Question 3

Fernlea Plumbing prepares a quote to install a rainwater system. The job needs \$520 of materials and 10 hours of labour at \$60 per hour; overhead is recovered at \$18 per labour hour. A margin of 20% of total cost is added, then GST.

- a. Calculate the total cost of the job.
- b. Calculate the margin and the selling price (excl. GST).
- c. Calculate the GST and the total quoted price (incl. GST).

Question 4

Vista Blinds makes a custom blind at a cost of \$70 (excl. GST). Using **cost-based pricing** it would apply an 80% mark-up. A market survey shows competitors charge \$140 (excl. GST) for a comparable blind.

- a. Calculate the selling price under cost-based pricing.
- b. State the selling price under market-based pricing, and calculate the profit per blind under each method.
- c. Justify which pricing method you would recommend, referring to both profit and competitiveness.

Question 5

Golden Grains Bakery sells sourdough loaves, each costing \$2.50 (excl. GST) to produce. The owner is considering three selling prices (excl. GST): \$5.00, \$6.00 and \$7.00, expecting to sell 200, 160 and 120 loaves per week respectively.

- a. Calculate the profit per loaf at each price.
- b. Calculate the total weekly profit at each price.
- c. State which price the owner should choose to maximise weekly profit, and explain the relationship between price, sales volume and profit shown by your figures.

Question 6

Rosewood Catering quotes to cater an event. The job needs \$600 of materials (food and drinks) and 12 hours of labour at \$40 per hour; overhead is recovered at \$30 per labour hour. A margin of 25% of total cost is added, then GST.

- a. Prepare the quote, showing total cost, margin, selling price (excl. GST), GST and the total quoted price.
- b. State the profit the business expects to earn on this job.
- c. Explain, in one or two sentences, why the business should honour the quoted price even if its actual costs turn out slightly higher than estimated.

Practice questions — unscaffolded

Question 7

Bluegum Furniture buys a bookshelf for \$140 (excl. GST) and uses cost-based pricing with a 65% mark-up. Calculate the selling price (excl. GST), the GST to be added, the total price the customer pays, and the profit per bookshelf.

Question 8

Aurora Lighting sells a designer lamp at the supplier's RRP of \$319 (GST-inclusive), having bought it for \$130 (excl. GST). Calculate the GST in the RRP, the GST-exclusive selling price, the profit per lamp, and the mark-up percentage on cost (to one decimal place).

Question 9

Stoneworks Paving prepares a quote to lay a patio. The job needs \$800 of materials and 24 hours of labour at \$50 per hour; overhead is recovered at \$25 per labour hour. A margin of 20% of total cost is added, then GST. Prepare the quote and state the total quoted price and the profit on the job.

Question 10

Seabreeze Surfboards can produce a board at a cost of \$180 (excl. GST). Competitors sell comparable boards at \$260 (excl. GST), and the owner requires a minimum profit of \$60 per board. Determine the profit per board at the market price, state whether it meets the owner's minimum, and calculate the mark-up percentage the market price represents (to one decimal place).

Question 11

Timberline Joinery makes a custom table at a cost of \$400 (excl. GST). Cost-based pricing would apply a 90% mark-up; a market survey shows comparable tables sell for \$700 (excl. GST). Calculate the selling price and profit under each method, then state and justify which method you would recommend — noting what the two prices imply about whether a cost-based table would actually sell.

Question 12

Redgum Renovations quotes to renovate a bathroom. The job needs \$2 500 of materials and 60 hours of labour at \$50 per hour; overhead is recovered at 50% of the labour cost. A margin of 15% of total cost is added, then GST. Prepare the quote and state the total quoted price and the profit on the job.

Question 13

Meadowlark Ceramics sells handmade mugs, each costing \$6 (excl. GST) to make. At a selling price of \$15 (excl. GST) it expects to sell 300 mugs a month; at \$18, 250 mugs; at \$21, 190 mugs. Calculate the total monthly profit at each price and state which price maximises profit.

Question 14

Northwind Signs quoted a total price of \$2 574 (GST-inclusive) for a job. The quote was built from \$600 of materials, 16 hours of labour at \$45 per hour, and \$360 of overhead, plus a margin, then GST. Calculate the GST-exclusive selling price, the total cost of the job, the margin added, and the margin as a percentage of total cost (to one decimal place).

Question 15

Sunburst Eyewear buys sunglasses for \$40 (excl. GST). The supplier's RRP is \$99 (GST-inclusive); alternatively the business could use cost-based pricing with a 120% mark-up. Calculate the profit per pair under each method, state which gives the greater profit, and give one reason a retailer might still choose to sell at the RRP.

Question 16

Cobalt Pools quotes to service and repair a pool. The job needs \$300 of materials and 8 hours of labour at \$65 per hour; overhead is recovered at \$35 per labour hour. A margin of 30% of total cost is added, then GST. Prepare the quote and state the total quoted price, the GST, and the profit on the job.

Question 17

A new business, Little Sprouts Childcare Supplies, is entering a market where several established competitors sell similar products at well-known prices. Explain which price-setting method — RRP, cost-based or market-based — is likely to be most appropriate for the new business, and justify your choice with reference to both competitiveness and the need to cover costs and earn a profit.

Question 18

Apex Auto Repairs prepares a quote for a customer to replace a car part. The owner knows the part costs the business \$120 (excl. GST) and the job needs 3 hours of labour, but on the written quote she lists the part at \$200 and the labour at 5 hours, presenting these as the actual materials and time required. She also tells the customer the price is “a special one-day-only rate” when it is the business's normal charge. Discuss the ethical considerations involved in setting

prices and preparing quotes honestly. Refer to at least two of the questionable practices above, and explain the possible consequences for the customer, for the business's reputation, and for its long-term profit.

Answers

1.
 - a. \$48 b. Profit \$18; GST \$4.80 (total price \$52.80)
2.
 - a. GST \$17; selling price \$170 b. \$75
3.
 - a. \$1 300 b. Margin \$260; selling price \$1 560 c. GST \$156; total \$1 716
4.
 - a. \$126 b. Market \$140; cost-based profit \$56, market profit \$70 c. See solutions
5.
 - a. \$2.50, \$3.50, \$4.50 b. \$500, \$560, \$540 c. \$6.00 (max weekly profit \$560)
6.
 - a. See solutions (total quoted price \$1 980) b. \$360 c. See solutions
7. Selling price \$231; GST \$23.10; total \$254.10; profit \$91
8. GST \$29; selling price \$290; profit \$160; mark-up 123.1%
9. Total quoted price \$3 432; profit \$520
10. Profit \$80 — meets the \$60 minimum; mark-up 44.4%
11. Cost-based \$760 (profit \$360); market \$700 (profit \$300); see solutions
12. Total quoted price \$8 855; profit \$1 050
13. \$2 700, \$3 000, \$2 850; \$18 maximises profit (\$3 000)
14. Selling price \$2 340; total cost \$1 680; margin \$660; margin 39.3% of cost
15. RRP profit \$50; cost-based profit \$48; RRP is greater; see solutions
16. Total quoted price \$1 573; GST \$143; profit \$330
17. See solutions
18. See solutions

Fully-worked solutions

Question 1

- a. Selling price = $\$30 \times (1 + 0.60) = \$30 \times 1.60 = \mathbf{\$48}$.
- b. Profit per vase = $\$48 - \$30 = \mathbf{\$18}$. GST = $10\% \times \$48 = \mathbf{\$4.80}$, so the customer pays \$52.80.
- c. Cost-based pricing is **simple and quick**, and because the mark-up is added to cost, **every sale is guaranteed to cover the \$30 cost and add a known \$18 margin** — the business can be confident it will not sell at a loss.

Question 2

- a. The RRP is GST-inclusive, so $\text{GST} = \$187 \div 11 = \mathbf{\$17}$ and the GST-exclusive selling price = $\$187 - \$17 = \mathbf{\$170}$.
- b. Profit per racquet = $\$170 - \$95 = \mathbf{\$75}$.
- c. **Advantage:** selling at the RRP is simple and keeps Peak Sports' price **consistent with other retailers**, which customers expect. **Disadvantage:** the RRP is set by the supplier, so it **may not suit Peak Sports' own costs or local market** — the \$75 margin is fixed by the supplier's recommended price, and departing from it to win sales means **discounting, which cuts that margin further**.

Question 3

- a. Materials \$520 + labour ($10 \times \$60 = \600) + overhead ($10 \times \$18 = \180) = **\$1 300**.
- b. Margin = $20\% \times \$1\,300 = \mathbf{\$260}$; selling price (excl. GST) = $\$1\,300 + \$260 = \mathbf{\$1\,560}$.
- c. GST = $10\% \times \$1\,560 = \mathbf{\$156}$; total quoted price = $\$1\,560 + \$156 = \mathbf{\$1\,716}$ (and $\$1\,716 \div 11 = \156).

Quote — Fernlea Plumbing (rainwater system)

Fernlea Plumbing	\$
Materials	520
Labour (10 hrs @ \$60)	600
Overhead (10 hrs @ \$18)	180
Total cost	1 300
Margin (20% of cost)	260
Price (excl. GST)	1 560
GST (10%)	156
Total quoted price	1 716

Question 4

- Cost-based selling price = $\$70 \times 1.80 = \126 .
- Market-based selling price = **\$140**. Profit per blind: cost-based = $\$126 - \$70 = \$56$; market-based = $\$140 - \$70 = \$70$.
- I would recommend **market-based pricing**. The market price of \$140 is **above** the cost-based price of \$126, so matching the market earns a **higher profit per blind (\$70 vs \$56)** while remaining **competitive** with rival businesses — customers comparing prices will not see Vista Blinds as overpriced. Cost-based pricing here would give away \$14 of margin per blind; undercutting the market by that much is unnecessary when simply matching it already keeps Vista Blinds competitive. (If the market price had been *below* the cost-based price, the recommendation would turn on whether the market price still covered cost and an acceptable margin.)

Question 5

- Profit per loaf = price – \$2.50: at \$5.00 → **\$2.50**; at \$6.00 → **\$3.50**; at \$7.00 → **\$4.50**.
- Total weekly profit = profit per loaf × loaves sold:

Price (excl. GST)	Profit/loaf \$	Loaves	Weekly profit \$
5.00	2.50	200	500
6.00	3.50	160	560
7.00	4.50	120	540

- The owner should choose **\$6.00**, which gives the greatest weekly profit of **\$560**. The figures show that profit does **not** simply rise with price: lifting the price increases the profit **per loaf** but reduces the **number sold**, so total profit peaks at a middle price and then falls as lost volume outweighs the extra margin.

Question 6

- Materials \$600 + labour ($12 \times \$40 = \480) + overhead ($12 \times \$30 = \360) = \$1 440 total cost; margin = $25\% \times \$1\,440 = \360 ; price (excl. GST) = \$1 800; GST = \$180; total quoted price = \$1 980.

Quote — Rosewood Catering (event catering)

Rosewood Catering	\$
Materials	600
Labour (12 hrs @ \$40)	480
Overhead (12 hrs @ \$30)	360
Total cost	1 440
Margin (25% of cost)	360
Price (excl. GST)	1 800
GST (10%)	180
Total quoted price	1 980

- Expected profit on the job = the margin = **\$360**.

- c. A quote is a **promise** the customer has relied on when accepting the job. Honouring it — absorbing a small over-run rather than adding surprise charges — is **honest and fair dealing** that protects Rosewood's reputation and its chance of repeat business; the over-run also signals the owner should improve future cost estimates rather than pass the error to the customer.

Question 7

Selling price = $\$140 \times 1.65 = \231 . GST = $10\% \times \$231 = \23.10 , so the total price the customer pays = $\$231 + \$23.10 = \$254.10$. Profit per bookshelf = $\$231 - \$140 = \$91$.

Question 8

GST in the RRP = $\$319 \div 11 = \29 ; GST-exclusive selling price = $\$319 - \$29 = \$290$. Profit per lamp = $\$290 - \$130 = \$160$. Mark-up on cost = $\$160 \div \$130 = 123.1\%$ (to one decimal place).

Question 9

Materials $\$800$ + labour ($24 \times \$50 = \$1\,200$) + overhead ($24 \times \$25 = \600) = $\$2\,600$ total cost; margin = $20\% \times \$2\,600 = \520 ; price (excl. GST) = $\$3\,120$; GST = $\$312$; total quoted price = $\$3\,432$.

Quote — Stoneworks Paving (patio)

Stoneworks Paving	\$
Materials	800
Labour (24 hrs @ \$50)	1 200
Overhead (24 hrs @ \$25)	600
Total cost	2 600
Margin (20% of cost)	520
Price (excl. GST)	3 120
GST (10%)	312
Total quoted price	3 432

Total quoted price = **\$3 432**; profit on the job = the margin = **\$520**.

Question 10

Profit per board at the market price = $\$260 - \$180 = \$80$. This **exceeds the owner's \$60 minimum**, so the market price is acceptable. Mark-up on cost = $\$80 \div \$180 = 44.4\%$ (to one decimal place).

Question 11

Cost-based: selling price = $\$400 \times 1.90 = \760 ; profit = $\$760 - \$400 = \$360$. Market-based: selling price = **\$700**; profit = $\$700 - \$400 = \$300$.

Although the cost-based price earns a higher profit **per table** (\$360 vs \$300), it is **\$60 above the market price** of \$700. At \$760 Timberline would be the dearest supplier of a comparable table, so it may **sell few or none** — meaning the higher per-unit profit is never actually earned. I would recommend **market-based pricing at \$700** (or trimming the mark-up so the price is competitive): a slightly lower margin on tables that **actually sell** produces more total profit than a high margin on tables that do not.

Question 12

Materials $\$2\,500$ + labour ($60 \times \$50 = \$3\,000$) + overhead ($50\% \times \$3\,000 = \$1\,500$) = $\$7\,000$ total cost; margin = $15\% \times \$7\,000 = \$1\,050$; price (excl. GST) = $\$8\,050$; GST = $\$805$; total quoted price = $\$8\,855$.

Quote — Redgum Renovations (bathroom renovation)

Redgum Renovations	\$
Materials	2 500

Redgum Renovations	\$
Labour (60 hrs @ \$50)	3 000
Overhead (50% of labour)	1 500
Total cost	7 000
Margin (15% of cost)	1 050
Price (excl. GST)	8 050
GST (10%)	805
Total quoted price	8 855

Total quoted price = **\$8 855**; profit on the job = the margin = **\$1 050**.

Question 13

Profit per mug = price – \$6: at \$15 → \$9; at \$18 → \$12; at \$21 → \$15. Total monthly profit:

Price (excl. GST)	Profit/mug \$	Mugs	Monthly profit \$
15	9	300	2 700
18	12	250	3 000
21	15	190	2 850

\$18 maximises profit at **\$3 000** — the middle price again outperforms both the lower price (too little margin) and the higher price (too little volume).

Question 14

GST in the quoted price = $\$2\,574 \div 11 = \234 , so the GST-exclusive selling price = $\$2\,574 - \$234 = \mathbf{\$2\,340}$. Total cost = materials \$600 + labour ($16 \times \$45 = \720) + overhead \$360 = **\$1 680**. Margin added = $\$2\,340 - \$1\,680 = \mathbf{\$660}$. Margin as a percentage of cost = $\$660 \div \$1\,680 = \mathbf{39.3\%}$ (to one decimal place).

Question 15

RRP: GST = $\$99 \div 11 = \9 , GST-exclusive price = \$90, profit = $\$90 - \$40 = \mathbf{\$50}$. Cost-based: selling price = $\$40 \times 2.20 = \88 , profit = $\$88 - \$40 = \mathbf{\$48}$.

The **RRP gives the greater profit** (\$50 vs \$48). A retailer might still choose the RRP even where it is only marginally higher because it keeps the price **consistent with other stores** (avoiding a “why are you dearer?” reaction), is **simple** to apply across a large range, and spares the business the effort of setting and justifying its own price on every line.

Question 16

Materials \$300 + labour ($8 \times \$65 = \520) + overhead ($8 \times \$35 = \280) = \$1 100 total cost; margin = $30\% \times \$1\,100 = \330 ; price (excl. GST) = \$1 430; GST = \$143; total quoted price = \$1 573.

Quote — Cobalt Pools (service and repair)

Cobalt Pools	\$
Materials	300
Labour (8 hrs @ \$65)	520
Overhead (8 hrs @ \$35)	280
Total cost	1 100
Margin (30% of cost)	330
Price (excl. GST)	1 430
GST (10%)	143
Total quoted price	1 573

Total quoted price = **\$1 573**; GST = **\$143**; profit on the job = the margin = **\$330**.

Question 17

Market-based pricing is likely to be most appropriate. Because customers can already see and compare the **well-known prices** of established competitors, a new business that prices **above** the market will struggle to attract customers, so it must set its price with the market firmly in mind to stay **competitive**. Cost-based pricing alone risks producing a price out of step with what customers expect, and the business cannot rely on an RRP for every line. However, market-based pricing must be applied with a **cost check**: Little Sprouts should confirm that the competitive market price still **covers its costs and leaves an acceptable margin** — if it does not, the business must find a way to reduce costs, add value that justifies a higher price, or reconsider entering that market at all. The best approach blends the two: use cost as the floor, then price to the market above it.

Question 18

Setting a price that earns a fair profit is legitimate business; **misrepresenting how that price was built is not**. At least two practices in this quote are dishonest. First, **inflating the part from \$120 to \$200 and the labour from 3 hours to 5 hours** overstates the materials and time the job genuinely requires — the customer is charged for resources that will not be used, and because those same padded figures feed the business's records, its reported costs and profit are also distorted. Second, calling an **ordinary price a “one-day-only special”** pressures the customer into deciding quickly on the basis of a false claim.

The likely **consequences** run in several directions. For the **customer**, the immediate harm is **paying more than the job is worth** on the strength of false information, and being manipulated into a rushed decision. For the business's **reputation**, the risk is severe: customers who later discover the part's real price or the true time taken feel **deceived**, leave poor reviews and warn others, and the conduct may breach **consumer-protection expectations of honest dealing**. For **long-term profit**, the damage outweighs the short-term gain — repeat business and word-of-mouth referrals, on which a repair business depends, dry up once trust is lost, so a few dollars gained today can cost far more in future sales. **Honest, transparent quoting** — stating the real materials, the real hours and the genuine price — protects the customer, the business's standing and its sustainable profit.

Chapter 5 Price-setting strategies — 5B Mark-up

Theory

Every business that sells a product must decide what to charge for it. One of the most common and straightforward ways to set that price is to start with what the product **cost** the business and add an amount on top to cover its other expenses and leave a profit. That added amount is the **mark-up**, and the method is called **cost-plus pricing**: $\text{selling price} = \text{cost price} + \text{mark-up}$.

Mark-up is the amount **added to the cost price** of a product to arrive at its **selling price**. It is almost always expressed as a **percentage of the cost price** — a “50% mark-up” means the business adds one-half of the cost price to the cost price. The cost price used is the **GST-exclusive** cost: the GST a business pays when it buys inventory is not an expense — it is reclaimed from the ATO through the **GST Clearing** account — so it forms no part of the cost on which the mark-up is calculated.

Applying a mark-up to find the selling price. If a product costs \$80 and the business applies a 25% mark-up, the mark-up in dollars is:

$$\text{mark-up \$} = \text{cost} \times \text{mark-up \%} = \$80 \times 25\% = \$20$$

and the selling price (excluding GST) is the cost plus that mark-up:

$$\text{selling price (excl. GST)} = \text{cost} + \text{mark-up \$} = \$80 + \$20 = \$100$$

The two steps fold into a single formula that is worth memorising:

$$\text{selling price (excl. GST)} = \text{cost price} \times (1 + \text{mark-up \%})$$

so $\$80 \times (1 + 0.25) = \$80 \times 1.25 = \$100$. The “1” reproduces the cost; the “0.25” adds the mark-up.

Finding the mark-up % from the prices. Working the other way, if the cost and the selling price are both known, the mark-up percentage is the mark-up in dollars expressed as a fraction **of the cost**:

$$\text{mark-up \%} = (\text{selling price} - \text{cost}) \div \text{cost}$$

For the example above, $(\$100 - \$80) \div \$80 = \$20 \div \$80 = 25\%$. The mark-up is measured against the cost price because that is the base to which it was added.

Working back from the selling price to the cost. Because the selling price is the cost multiplied by $(1 + \text{mark-up \%})$, the cost can be recovered by **dividing**:

$$\text{cost price} = \text{selling price (excl. GST)} \div (1 + \text{mark-up \%})$$

A product selling for \$100 excluding GST after a 25% mark-up cost $\$100 \div 1.25 = \80 . This “work back” is how a business checks a supplier’s price or reconstructs a cost it has mislaid.

Mark-up on cost is NOT the gross profit margin. Students very often confuse the two, because both compare profit to a price — but they use a **different base**:

- **Mark-up %** measures the mark-up against the **cost price**: $(\text{SP} - \text{cost}) \div \text{cost}$.
- **Gross profit margin** measures the same gross profit against the **selling price**: $(\text{SP} - \text{cost}) \div \text{selling price}$. (Gross profit here = selling price – cost of the item.)

For the \$80 product marked up to \$100, the gross profit is \$20 either way — but the mark-up is $\$20 \div \$80 = 25\%$, while the gross profit margin is $\$20 \div \$100 = 20\%$. The **same dollar profit** is a **larger** percentage of the smaller cost than of the larger selling price, so the **mark-up % is always greater than the gross profit margin** for the same item. The two are linked exactly by:

$$\text{gross profit margin} = \text{mark-up \%} \div (1 + \text{mark-up \%}) \text{ and } \text{mark-up \%} = \text{margin} \div (1 - \text{margin})$$

so a 25% mark-up gives a $0.25 \div 1.25 = 20\%$ margin, and to *achieve* a 20% margin you would apply a $0.20 \div 0.80 = 25\%$ mark-up. A business that says “we work on a 50% mark-up” is therefore **not** earning a 50% margin — its margin is $0.50 \div 1.50 = 33\frac{1}{3}\%$.

GST on the marked-up price. The mark-up sets the **GST-exclusive** selling price — the price the business keeps. When the sale is made, the business must **add 10% GST on top** of that price, because it is a registered collector of GST:

$$\text{GST} = 10\% \times \text{selling price (excl. GST)}; \text{selling price (incl. GST)} = \text{selling price} \times 1.1$$

For the \$100 selling price, GST = \$10 and the customer pays **\$110**. That \$10 is **not revenue** — it is collected on behalf of the ATO and recorded as a **liability** in the **GST Clearing** account until it is remitted. As a useful cross-check, the GST is exactly **1/11 of the GST-inclusive price** ($\$110 \div 11 = \10). The mark-up (which the business keeps as gross profit) and the GST (which it passes on to the ATO) are two entirely separate additions to the cost price.

Worked model. *Northwind Homewares* buys a desk lamp for \$80 and marks it up 25% on cost. The selling price is $\$80 \times 1.25 = \100 excluding GST; adding 10% GST makes the shelf price \$110. Its full **mark-up schedule** for four lines shows how different mark-ups on different costs flow through to the shelf price — and how the gross profit margin always sits **below** the mark-up:

Product	Cost \$	Mark-up %	Mark-up \$	Selling price (excl. GST) \$	GST \$	Selling price (incl. GST) \$
Desk lamp	80	25%	20	100	10	110
Wall clock	40	150%	60	100	10	110
Bar stool	120	50%	60	180	18	198
Photo frame	25	100%	25	50	5	55

The desk lamp and wall clock reach the **same** \$100 selling price from very different costs and mark-ups — a low cost needs a high mark-up percentage to reach the same price. Their gross profit margins are 20% and 60% respectively, both below the 25% and 150% mark-ups that produced them.

Ethical considerations. Setting a mark-up is a business decision, but it is not free of ethical duties. A business is entitled to a mark-up that covers its expenses and rewards the owner for the risk of trading — pricing below cost is unsustainable, and a fair return is legitimate. Ethical questions arise at the **extremes** and in how the price is **represented**. Sharply increasing a mark-up to exploit customers who have no alternative — for example, inflating the price of an essential good during a shortage or emergency (**price gouging**) — pursues short-term profit at the expense of vulnerable customers and the business’s own reputation and long-term relationships. Equally, where a price is quoted to a client on a **cost-plus** basis, the stated cost must be the **genuine** cost: overstating it to justify a higher charge breaches the customer’s trust and the **faithful representation** of the transaction. A business should also not **mislead** customers about how a price is built up — for instance, by describing GST (which it merely collects for the ATO) as though it were part of its own mark-up. Ethical pricing weighs the legitimate interests of the owner against fairness and honesty toward customers, employees and the wider community, and considers the business’s long-term standing, not just this month’s profit.

Worked examples (scaffolded)

Example 1 — applying a mark-up to build a selling-price schedule

Riverbend Outdoors sets its prices by mark-up on cost. It buys an *Alpine* backpack for \$50 (mark-up 60%), a *Trek* camp stove for \$120 (mark-up 25%) and a *Summit* water filter for \$45 (mark-up 100%). Prepare a mark-up schedule showing, for each product, the mark-up in dollars, the selling price excluding GST, the GST and the GST-inclusive selling price.

Working	Comment
Mark-up \$ = cost × mark-up %: backpack $\$50 \times 60\% = \30 ; stove $\$120 \times 25\% = \30 ; filter $\$45 \times 100\% = \45 .	The mark-up is always a percentage of the cost price , so multiply each cost by its own rate.

Working	Comment
Selling price (excl. GST) = cost + mark-up: \$50 + \$30 = \$80; \$120 + \$30 = \$150; \$45 + \$45 = \$90.	Equivalently, $\text{cost} \times (1 + \text{mark-up } \%)$: $\$50 \times 1.60$, $\$120 \times 1.25$, $\$45 \times 2.00$.
GST = 10% of the selling price: \$8, \$15, \$9.	GST is added to the GST-exclusive selling price, never to the cost.
Selling price (incl. GST) = SP $\times$ 1.1: \$88, \$165, \$99.	This is the shelf price the customer pays; the GST portion is a liability owed to the ATO.

Mark-up schedule — Riverbend Outdoors

Product	Cost \$	Mark-up %	Mark-up \$	Selling price (excl. GST) \$	GST \$	Selling price (incl. GST) \$
Alpine backpack	50	60%	30	80	8	88
Trek camp stove	120	25%	30	150	15	165
Summit water filter	45	100%	45	90	9	99

Example 2 — finding the mark-up % (and the gross profit margin) from the prices

Coastal Kitchenware buys a *Chef's* frypan for \$64 and sells it for \$96 (excluding GST); it buys a *Whisk* stand mixer for \$150 and sells it for \$240 (excluding GST). For each product calculate the mark-up in dollars, the mark-up percentage on cost and the gross profit margin.

Working	Comment
Mark-up \$ = selling price – cost: frypan $\$96 - \$64 = \$32$; mixer $\$240 - \$150 = \$90$.	The dollar mark-up is simply the gap between cost and selling price.
Mark-up % = mark-up \$ $\div$ cost: frypan $\$32 \div \$64 = 50\%$; mixer $\$90 \div \$150 = 60\%$.	The mark-up % is measured against the cost — the base it was added to.
Gross profit margin = mark-up \$ $\div$ selling price: frypan $\$32 \div \$96 = 33\frac{1}{3}\%$; mixer $\$90 \div \$240 = 37.5\%$.	The same dollar profit measured against the selling price — a larger base, so a smaller %.
Note that for each product the mark-up % exceeds the margin ($50\% > 33\frac{1}{3}\%$; $60\% > 37.5\%$).	Mark-up on cost is always greater than the gross profit margin for the same item.

Comparison — Coastal Kitchenware

Product	Cost \$	Selling price (excl. GST) \$	Mark-up \$	Mark-up %	Gross profit margin %
Chef's frypan	64	96	32	50%	33 $\frac{1}{3}$ %
Whisk stand mixer	150	240	90	60%	37.5%

Worked examples (unscaffolded)

Example 3 — working back from a GST-inclusive shelf price to the cost

Delta Hardware tags a cordless drill at \$154 including GST. The business sets its prices by a mark-up of 75% on cost. Calculate the cost price of the drill.

First strip the GST to reach the selling price the mark-up produced: selling price (excl. GST) = $\$154 \div 1.1 = \140 . That selling price is the cost multiplied by $(1 + 0.75)$, so the cost is recovered by dividing: cost = $\$140 \div 1.75 = \80 . Check: $\$80 \times 1.75 = \140 , and the mark-up in dollars is $\$140 - \$80 = \$60$ (which is 75% of \$80).

$\therefore$ the drill cost *Delta Hardware* **\$80**.

Example 4 — distinguishing a mark-up on cost from a gross profit margin

Summit Sports marks up all its inventory by 25% on cost. A tennis racquet costs the business \$150. Show that the 25% mark-up does **not** give a 25% gross profit margin, and calculate the mark-up *Summit Sports* would need if it instead wanted a 25% gross profit margin on the racquet.

At a 25% mark-up the selling price is $\$150 \times 1.25 = \187.50 , so the gross profit is $\$187.50 - \$150 = \$37.50$. Measured against the **selling price**, the margin is $\$37.50 \div \$187.50 = 20\%$ — not 25%. The mark-up (25%) is larger than the margin (20%) because the same \$37.50 profit is a bigger slice of the \$150 cost than of the \$187.50 selling price.

To earn a **25% margin**, the cost must be 75% of the selling price, so selling price = $\$150 \div 0.75 = \200 and gross profit = \$50. The mark-up needed is $\$50 \div \$150 = 33\frac{1}{3}\%$ (using mark-up = margin $\div$ (1 – margin) = $0.25 \div 0.75$).

$\therefore$ a 25% mark-up yields a 20% margin, and a **33 $\frac{1}{3}$ % mark-up** is required to yield a 25% margin.

Practice questions — scaffolded

Question 1

Harbourline Trading buys a reading lamp for \$60 and applies a mark-up of 50% on cost.

- Calculate the mark-up in dollars.
- Calculate the selling price excluding GST.
- Calculate the GST added and the GST-inclusive price the customer pays.

Question 2

Meadowview Homewares prices three products by mark-up on cost: a vase (cost \$40, mark-up 25%), a cushion (cost \$80, mark-up 75%) and a floor lamp (cost \$150, mark-up 20%).

- Complete a mark-up schedule showing the mark-up in dollars and the selling price (excluding GST) of each product.
- Calculate the GST and the GST-inclusive selling price of the cushion.
- Calculate the gross profit margin on the vase.

Question 3

Brookvale Traders buys a travel bag for \$50 and sells it for \$65 excluding GST.

- Calculate the mark-up in dollars.
- Calculate the mark-up percentage on cost.
- Calculate the GST-inclusive selling price.

Question 4

Fernlea Gifts buys a gift hamper for \$120 and marks it up 25% on cost.

- Calculate the selling price excluding GST.
- Calculate the gross profit margin.
- Explain why a 25% mark-up on cost does not produce a 25% gross profit margin.

Question 5

Cedar Living sells a floor rug for \$200 excluding GST, having applied a mark-up of 60% on cost.

- Calculate the cost price of the rug.
- Calculate the mark-up in dollars.

- c. Calculate the GST-inclusive selling price.

Question 6

Parkside Pantry tags a coffee grinder at \$110 including GST and works on a mark-up of 25% on cost.

- Calculate the selling price excluding GST.
- Calculate the cost price of the grinder.
- Calculate the gross profit margin.

Practice questions — unscaffolded

Question 7

Ironbark Furniture buys a bookshelf for \$250 and applies a mark-up of 40% on cost. Calculate the mark-up in dollars, the selling price excluding GST, the GST, and the GST-inclusive price the customer pays.

Question 8

Brightpoint Stationery prices four products by mark-up on cost: a pen (cost \$8, mark-up 150%), a notebook (cost \$30, mark-up 40%), a folder (cost \$45, mark-up 20%) and a calculator (cost \$60, mark-up 25%). Prepare the completed mark-up schedule showing, for each product, the mark-up in dollars, the selling price excluding GST, the GST and the GST-inclusive selling price.

Question 9

Coastline Traders buys a kettle for \$96 and sells it for \$120 excluding GST. Calculate the mark-up percentage on cost and the gross profit margin, and explain in one sentence why the two percentages differ.

Question 10

Northpeak Cycles sells a bike seat for \$189 excluding GST, having applied a mark-up of 80% on cost. Calculate the cost price and the mark-up in dollars.

Question 11

Two products each cost a business \$100. Product X is marked up 25% on cost; product Y is marked up 100% on cost. Calculate the selling price (excluding GST) and the gross profit margin of each, and state the relationship between the mark-up on cost and the gross profit margin.

Question 12

Greenacre Garden Centre tags a planter at \$220 including GST and works on a mark-up of 60% on cost. Calculate the selling price excluding GST and the cost price of the planter.

Question 13

Rivergum Retail wants to earn a gross profit margin of 40% on a jacket that costs \$90. Calculate the mark-up percentage on cost the business must apply, and the resulting selling price (excluding GST).

Question 14

Highfield Electrical pays its supplier \$330 including GST for a coffee machine and prices its inventory using a mark-up of 30% on cost. Calculate the cost price to which the mark-up is applied, the selling price excluding GST and the GST-inclusive price the customer pays, and explain why the GST charged by the supplier is excluded from the cost used to set the price.

Question 15

Lakeview Sports currently marks up a \$200-cost kayak by 25% on cost. It is considering raising the mark-up to 60% on cost. Model the effect of the change on the selling price (excluding GST), the gross profit per kayak and the gross profit margin, and discuss one factor the business should weigh before raising the mark-up.

Question 16

A shopkeeper tells a customer, “We only make 50% on this item,” meaning the item is marked up 50% on cost. Using an item that costs \$60, explain why the business’s gross profit margin is not 50%, and state the gross profit margin.

Question 17

During a regional flood, demand for portable generators surges. *Stormguard Supplies*, which buys a generator for \$40 and normally applies a 60% mark-up, raises its mark-up to 300% on cost for two weeks. Calculate the ordinary and the surge selling prices (excluding GST), and discuss the ethical considerations involved in the business’s decision, referring to the interests of both the business and its customers.

Question 18

Using a product that costs \$80 and is marked up 25% on cost, explain the difference between the mark-up a business adds to the cost price and the GST it adds to the selling price. Refer to who ultimately receives each amount and to how each affects the price the customer pays.

Answers

1.
 - a. \$30 b. \$90 c. GST \$9; incl. \$99
2.
 - a. Vase SP \$50 (mark-up \$10); cushion SP \$140 (mark-up \$60); floor lamp SP \$180 (mark-up \$30) b. GST \$14; incl. \$154 c. 20%
3.
 - a. \$15 b. 30% c. \$71.50
4.
 - a. \$150 b. 20% c. see solutions
5.
 - a. \$125 b. \$75 c. \$220
6.
 - a. \$100 b. \$80 c. 20%
7. Mark-up \$100; SP (excl.) \$350; GST \$35; incl. \$385
8. Pen SP \$20; notebook SP \$42; folder SP \$54; calculator SP \$75 (see schedule)
9. Mark-up 25%; margin 20%; see solutions
10. Cost \$105; mark-up \$84
11. X: SP \$125, margin 20%; Y: SP \$200, margin 50%; mark-up % always exceeds the margin
12. SP (excl.) \$200; cost \$125
13. Mark-up 66⅔%; SP (excl.) \$150
14. Cost \$300; SP (excl.) \$390; incl. \$429; see solutions
15. SP \$250 → \$320; gross profit \$50 → \$120; margin 20% → 37.5%
16. Margin 33⅓%
17. Ordinary SP \$64; surge SP \$160; see solutions (discussion)
18. See solutions

Fully-worked solutions

Question 1

- a. Mark-up \$ = $\$60 \times 50\% = \30 .
- b. Selling price (excl. GST) = $\$60 + \$30 = \$90$ (or $\$60 \times 1.5$).
- c. GST = $10\% \times \$90 = \9 ; GST-inclusive price = $\$90 \times 1.1 = \99 .

Question 2

- a. Vase: mark-up $\$40 \times 25\% = \10 , SP = **\$50**. Cushion: mark-up $\$80 \times 75\% = \60 , SP = **\$140**. Floor lamp: mark-up $\$150 \times 20\% = \30 , SP = **\$180**.

Product	Cost \$	Mark-up %	Mark-up \$	Selling price (excl. GST) \$	GST \$	Selling price (incl. GST) \$
Vase	40	25%	10	50	5	55
Cushion	80	75%	60	140	14	154
Floor lamp	150	20%	30	180	18	198

- b. Cushion GST = $10\% \times \$140 = \14 ; GST-inclusive price = $\$140 \times 1.1 = \154 .
- c. Vase gross profit margin = mark-up \$ ÷ selling price = $\$10 \div \$50 = 20\%$.

Question 3

- a. Mark-up \$ = $\$65 - \$50 = \$15$.
- b. Mark-up % = $\$15 \div \$50 = 30\%$ (measured against the cost).
- c. GST = $10\% \times \$65 = \6.50 ; GST-inclusive price = $\$65 \times 1.1 = \71.50 .

Question 4

- a. Selling price (excl. GST) = $\$120 \times 1.25 = \mathbf{\$150}$.
- b. Gross profit = $\$150 - \$120 = \$30$; gross profit margin = $\$30 \div \$150 = \mathbf{20\%}$.
- c. The **mark-up** measures the \$30 profit against the **cost** ($\$30 \div \$120 = 25\%$), while the **gross profit margin** measures the **same** \$30 against the larger **selling price** ($\$30 \div \$150 = 20\%$). Because the selling price is bigger than the cost, the profit is a smaller fraction of it, so the margin (20%) is always below the mark-up (25%). Exactly, $\text{margin} = \text{mark-up} \div (1 + \text{mark-up}) = 0.25 \div 1.25 = 20\%$.

Question 5

- a. Cost = selling price $\div (1 + \text{mark-up } \%) = \$200 \div 1.6 = \mathbf{\$125}$.
- b. Mark-up \$ = $\$200 - \$125 = \mathbf{\$75}$ (check: $\$75 \div \$125 = 60\%$).
- c. GST = $10\% \times \$200 = \20 ; GST-inclusive price = $\$200 \times 1.1 = \mathbf{\$220}$.

Question 6

- a. Selling price (excl. GST) = $\$110 \div 1.1 = \mathbf{\$100}$.
- b. Cost = $\$100 \div (1 + 0.25) = \$100 \div 1.25 = \mathbf{\$80}$.
- c. Gross profit = $\$100 - \$80 = \$20$; gross profit margin = $\$20 \div \$100 = \mathbf{20\%}$.

Question 7

Mark-up \$ = $\$250 \times 40\% = \mathbf{\$100}$. Selling price (excl. GST) = $\$250 + \$100 = \mathbf{\$350}$ (or $\$250 \times 1.4$). GST = $10\% \times \$350 = \mathbf{\$35}$. GST-inclusive price = $\$350 \times 1.1 = \mathbf{\$385}$.

Question 8

Product	Cost \$	Mark-up %	Mark-up \$	Selling price (excl. GST) \$	GST \$	Selling price (incl. GST) \$
Pen	8	150%	12	20	2	22
Notebook	30	40%	12	42	4.20	46.20
Folder	45	20%	9	54	5.40	59.40
Calculator	60	25%	15	75	7.50	82.50

Each mark-up \$ = cost $\times$ mark-up %; each selling price (excl. GST) = cost + mark-up \$; each GST = 10% of the selling price; each GST-inclusive price = selling price $\times$ 1.1.

Question 9

Mark-up \$ = $\$120 - \$96 = \$24$. **Mark-up %** = $\$24 \div \$96 = \mathbf{25\%}$ (against the cost). **Gross profit margin** = $\$24 \div \$120 = \mathbf{20\%}$ (against the selling price). The two percentages differ because they use a different base — the mark-up is measured against the smaller cost price and the margin against the larger selling price, so the same \$24 profit is a larger percentage as a mark-up (25%) than as a margin (20%).

Question 10

Cost = selling price $\div (1 + \text{mark-up } \%) = \$189 \div 1.8 = \mathbf{\$105}$. Mark-up \$ = $\$189 - \$105 = \mathbf{\$84}$ (check: $\$84 \div \$105 = 80\%$).

Question 11

Product X: selling price = $\$100 \times 1.25 = \mathbf{\$125}$; gross profit = \$25; margin = $\$25 \div \$125 = \mathbf{20\%}$. Product Y: selling price = $\$100 \times 2.00 = \mathbf{\$200}$; gross profit = \$100; margin = $\$100 \div \$200 = \mathbf{50\%}$. In both cases the gross profit margin is **below** the mark-up on cost ($20\% < 25\%$; $50\% < 100\%$), because the mark-up is measured against the cost while the margin is measured against the larger selling price. The link is exact: $\text{margin} = \text{mark-up} \div (1 + \text{mark-up})$, so $0.25 \div 1.25 = 20\%$ and $1.00 \div 2.00 = 50\%$.

Question 12

Selling price (excl. GST) = $\$220 \div 1.1 = \200 . Cost = $\$200 \div (1 + 0.60) = \$200 \div 1.6 = \$125$ (check: $\$125 \times 1.6 = \200 , and $\$200 \times 1.1 = \220).

Question 13

To earn a 40% margin the cost is 60% of the selling price, so selling price = $\$90 \div (1 - 0.40) = \$90 \div 0.60 = \$150$. Gross profit = $\$150 - \$90 = \$60$, so the mark-up on cost = $\$60 \div \$90 = 66\frac{2}{3}\%$ (using mark-up = margin $\div$ (1 - margin) = $0.40 \div 0.60$). Check: the cost is 60% of the selling price, and $\$150 \times 0.60 = \90 .

Question 14

The supplier's price includes GST, so the GST must be stripped out before the mark-up is applied: cost (excl. GST) = $\$330 \div 1.1 = \300 (the GST paid to the supplier is $\$330 - \$300 = \$30$). Mark-up \$ = $\$300 \times 30\% = \90 , so the selling price (excl. GST) = $\$300 + \$90 = \$390$ (or $\$300 \times 1.3$). GST on the sale = $10\% \times \$390 = \39 , so the customer pays $\$390 \times 1.1 = \429 .

The \$30 of GST charged by the supplier is **not** part of the cost of the inventory. *Highfield Electrical* is registered for GST, so it reclaims that \$30 from the ATO through the **GST Clearing** account — the GST never becomes an expense the business has to recover from its customers, and so it forms no part of the base to which the mark-up is applied. Marking up the \$330 GST-inclusive figure would instead treat recoverable GST as though it were a real cost: it overstates the cost base by \$30, adds \$9 of mark-up the business has not earned ($\$330 \times 30\% = \99 rather than \$90), and pushes the shelf price the customer pays from \$429 up to \$471.90.

Question 15

At the current 25% mark-up: selling price = $\$200 \times 1.25 = \250 ; gross profit per kayak = $\$250 - \$200 = \$50$; gross profit margin = $\$50 \div \$250 = 20\%$. At the proposed 60% mark-up: selling price = $\$200 \times 1.60 = \320 ; gross profit per kayak = $\$320 - \$200 = \$120$; gross profit margin = $\$120 \div \$320 = 37.5\%$. The change lifts the selling price by \$70, the gross profit per kayak by \$70 and the margin from 20% to 37.5%. Before raising the mark-up the business should weigh the likely effect on **demand**: a higher price earns more profit **per unit**, but if customers can buy a comparable kayak elsewhere for less, unit sales may fall so far that **total** gross profit drops. It should also consider its competitors' prices, the value customers place on the product and the risk to its reputation and repeat business if the price is seen as unfair.

Question 16

The "50%" is a mark-up on **cost**, not a margin on the selling price. For a \$60-cost item, mark-up \$ = $\$60 \times 50\% = \30 , so the selling price is \$90 and the gross profit is \$30. The **gross profit margin** measures that \$30 against the **selling price**: $\$30 \div \$90 = 33\frac{1}{3}\%$. It is not 50% because the margin is calculated on the larger selling price (\$90), not on the cost (\$60). The shopkeeper is really earning a 33 $\frac{1}{3}$ % margin, even though the mark-up on cost is 50%.

Question 17

Ordinary selling price = $\$40 \times 1.60 = \64 (excl. GST); surge selling price = $\$40 \times (1 + 3.00) = \160 (excl. GST) — \$176 including GST, two-and-a-half times the usual price for the same \$40-cost generator. **Discussion.** A business is entitled to a mark-up that covers its expenses and rewards it for the risk of trading, and prices do legitimately rise when a good becomes scarce. However, sharply lifting the mark-up to 300% on an **essential** good during an emergency, when customers are distressed and have no real alternative, is **price gouging** — it pursues short-term profit by exploiting people's vulnerability. Ethically the business must weigh its legitimate interest in profit against **fairness** to customers who are in genuine need, the wellbeing of the affected community, and its own **long-term reputation** and customer relationships, which a perception of exploitation can badly damage. A more defensible response is a modest, justifiable adjustment for any genuinely higher costs of supply, rather than a mark-up set to capture the maximum the desperate will pay. (Some essential-goods pricing in emergencies may also attract regulatory or consumer-law scrutiny.)

Question 18

For an \$80-cost product marked up 25%: mark-up \$ = $\$80 \times 25\% = \20 , selling price (excl. GST) = \$100, GST = $10\% \times \$100 = \10 , and the customer pays \$110. The **mark-up (\$20)** is the amount the business **adds for itself** — it is the business's **gross profit** on the item and stays with the business to cover its expenses and provide a return to the

owner. The **GST (\$10)** is added **on top** of the selling price, but the business does **not** keep it: GST is collected **on behalf of the ATO** and recorded as a **liability** in the **GST Clearing** account until it is remitted, so it is not the business's revenue. Both additions increase the price the customer pays — the customer pays cost + mark-up + GST = \$110 — but only the mark-up benefits the business; the GST simply passes through it to the government.

Chapter 5 Price-setting strategies — 5C Cost-volume-profit analysis and break-even

Theory

When an owner sets a price, they need to know how many units they must sell before the business starts to make a profit — and how a change in the price, the costs or the sales volume will move that number. **Cost-volume-profit (CVP) analysis** answers exactly these questions. It examines the relationship between the **costs** a business incurs, the **volume** (number of units) it sells and the **profit** it earns, so the owner can plan a price and a sales target with confidence rather than by guesswork. In a service business a “unit” is one service sold — a haircut, a lesson, a car detail, a lawn mow — so throughout this section “units” means the number of services provided.

Fixed and variable costs. CVP analysis begins by sorting every cost into one of two behaviours:

- A **fixed cost** stays the **same in total** regardless of how many units are sold within the period. Rent, insurance, a manager’s salary, equipment leasing and council rates are fixed: the business pays the same amount whether it serves ten customers or a thousand. (Per unit, a fixed cost *falls* as volume rises, because the same total is spread over more units.)
- A **variable cost** changes **in total in direct proportion** to the number of units sold, but stays the **same per unit**. The cleaning agents used on each car detail, the printing materials in each banner, the fuel burned on each tour — each unit sold adds the same variable cost, so total variable cost rises and falls with volume.

CVP analysis assumes each cost can be classified cleanly as fixed or variable, that the selling price and the variable cost per unit stay constant, and that these relationships hold over the **relevant range** of activity the business realistically expects. These are simplifying assumptions; they make the analysis a powerful planning tool, but the owner must remember the answer is a **model**, not a guarantee.

Contribution margin. The **contribution margin per unit** is what each unit sold *contributes* to covering the business’s fixed costs and, once those are covered, to profit. It is found by subtracting the **variable cost per unit** from the **selling price per unit**:

$$\text{contribution margin per unit} = \text{selling price per unit} - \text{variable cost per unit}$$

Only *variable* costs are deducted here, because only they are caused by selling one more unit — the fixed costs are unchanged by the decision to sell one extra service. The first units sold in a period use their contribution to pay off the fixed costs; every unit sold *after* the fixed costs are fully covered contributes its whole margin straight to **profit**. The **contribution margin ratio** expresses the margin as a fraction of the selling price (contribution margin ÷ selling price) and is useful for working in sales dollars rather than units.

The break-even point. The **break-even point** is the level of sales at which **total revenue exactly equals total costs**, so the business makes **neither a profit nor a loss** — profit is zero. At break-even the total contribution margin earned is *just enough* to cover the fixed costs. Because each unit contributes its margin towards the fixed costs, the number of units needed to break even is:

$$\text{break-even point (units)} = \text{fixed costs} \div \text{contribution margin per unit}$$

The break-even point can also be expressed in **dollars** of sales — the sales *revenue* the business must earn to break even. Two equivalent routes give the same figure:

$$\text{break-even point (\$)} = \text{break-even units} \times \text{selling price per unit}$$

$$\text{break-even point (\$)} = \text{fixed costs} \div \text{contribution margin ratio}$$

Below the break-even point the business makes a **loss**; above it, a **profit**. This lets the owner turn a target into a plain sales number: “we must sell 120 details a month just to cover our costs”.

Selling for a target profit. Break-even is rarely the real goal — the owner wants a **profit**. To find the volume that earns a specific **target profit**, the fixed costs *and* the desired profit must both be covered by contribution, so the target profit is simply added to the fixed costs in the numerator:

$$\text{units for a target profit} = (\text{fixed costs} + \text{target profit}) \div \text{contribution margin per unit}$$

Multiplying that unit figure by the selling price gives the **sales revenue** required to reach the target. A useful way to see why the formula works is that **profit = (units sold × contribution margin per unit) – fixed costs**: rearranging this identity for a chosen profit produces the target-profit formula, and setting the profit to zero produces the break-even formula.

Margin of safety. The **margin of safety** measures how far the current (or budgeted) level of sales sits **above** the break-even point — that is, how far sales could **fall** before the business begins to make a loss. It can be stated in units, in dollars, or as a percentage:

margin of safety (units) = budgeted (or actual) sales units – break-even units

margin of safety (\$) = margin of safety units × selling price

margin of safety ratio = margin of safety units ÷ budgeted sales units

A **large** margin of safety means sales can drop a long way before a loss occurs, so the business is **lower risk**; a **small** margin of safety warns the owner that even a modest downturn would push the business into a loss.

The effect of price, cost and volume changes. CVP analysis is at its most useful when the owner **models** the effect of a proposed change *before* committing to it. Each type of change works through the model differently:

- A change in the **selling price** or in the **variable cost per unit** changes the **contribution margin**, and so changes the break-even point and every profit figure. A higher price (or a lower variable cost) **raises** the margin, so **fewer** units are needed to break even; a lower price (or a higher variable cost) **lowers** the margin, so **more** units are needed. When modelling a price rise the analysis usually holds volume constant to isolate the effect — but the owner must remember a higher price may itself **reduce demand**, so the model is a starting point for judgement, not the last word.
- A change in **fixed costs** (a rent rise, new insurance, extra advertising) does **not** change the contribution margin, but it moves the break-even point directly: higher fixed costs mean **more** units must be sold to cover them.
- A change in **volume** alone changes neither the contribution margin nor the break-even point, but it changes the **profit** and the **margin of safety** — selling more lifts profit and widens the safety buffer; selling less does the reverse.

Ethical considerations. A break-even and CVP analysis is often prepared to support a decision that affects other people — most importantly a **lender** deciding whether to advance a loan, or an owner deciding whether a venture is viable. Under the **faithful representation** characteristic the figures fed into the analysis must be **complete, free from material error and neutral (without bias)**: it is unethical (and ultimately self-defeating) to understate the variable cost per unit or leave out fixed costs simply to produce a lower, more flattering break-even point, or to assume an optimistic price the market will not bear. The **verifiability** characteristic requires that every cost and price used can be traced to real quotes, invoices and contracts, so an independent reader could arrive at the same numbers. An owner who massages the inputs may win the loan or talk themselves into the venture, but the business will still have to sell the *real* break-even quantity — and a plan built on distorted figures misleads the lender, harms the owner and can leave suppliers and employees exposed when the business cannot meet costs it pretended were lower. Honest, evidence-based assumptions are the foundation of a CVP analysis that is genuinely useful for a decision.

Worked model. *Brightwave Car Detailing* is a service business that sells one product — a full car detail — for \$80 each. The variable cost of each detail (wax, cloths, water and cleaning agents) is \$30, and the fixed costs of the business (rent, insurance and the owner's salary) are \$6 000 per month.

- **Contribution margin per unit** = \$80 – \$30 = **\$50**. Each detail contributes \$50 towards fixed costs and then profit. The contribution margin ratio is $50 \div 80 = 0.625$ (**62.5%**).
- **Break-even (units)** = $6\,000 \div 50 = 120$ details. **Break-even (\$)** = $120 \times 80 = \$9\,600$ (equivalently $6\,000 \div 0.625 = \$9\,600$).
- **For a target profit of \$2 000:** $(6\,000 + 2\,000) \div 50 = 160$ details, i.e. \$12 800 of sales.
- If the owner **budgets to sell 200 details**, the **margin of safety** is $200 - 120 = 80$ details (\$6 400) — sales could fall by 80 details before a loss.

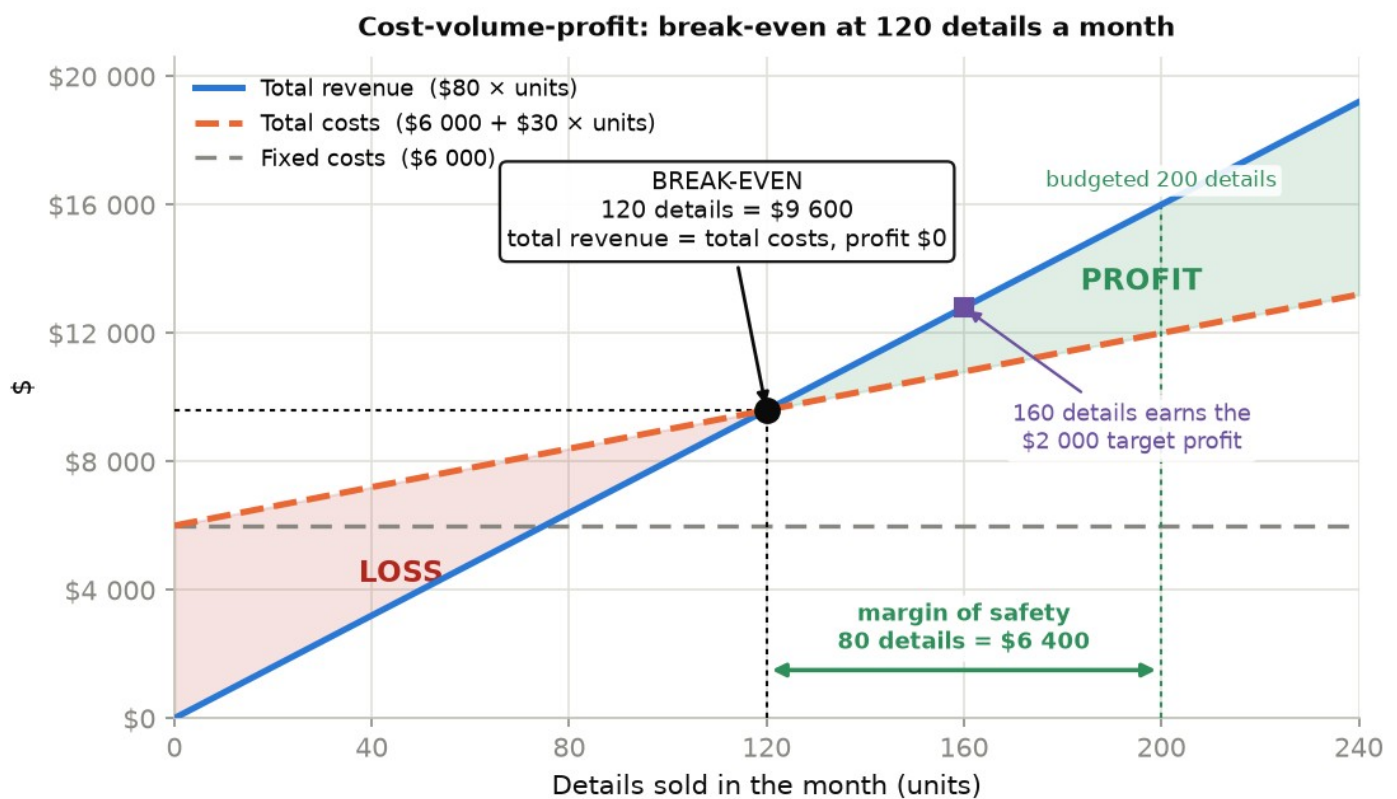
The CVP schedule below shows revenue, costs and profit at a range of volumes; the loss shrinks to zero exactly at 120 details and turns to profit above it.

Units sold	Sales revenue \$	Variable costs \$	Contribution margin \$	Fixed costs \$	Profit / (loss) \$
0	0	0	0	6 000	(6 000)
60	4 800	1 800	3 000	6 000	(3 000)
120	9 600	3 600	6 000	6 000	0
180	14 400	5 400	9 000	6 000	3 000
240	19 200	7 200	12 000	6 000	6 000

Reading across any row, sales revenue – variable costs = contribution margin, and contribution margin – fixed costs = profit; reading down, profit rises by \$3 000 for every extra 60 details, which is $60 \times$ the \$50 contribution margin.

The same relationships plotted as lines show *why* there is exactly one break-even point. Total revenue (\$80 per detail) starts at the origin and climbs steeply; total costs (\$6 000 + \$30 per detail) start at the fixed costs and climb more gently. Two straight lines with different gradients can cross only once, and where they cross the two are equal:

Brightwave Car Detailing



Brightwave Car Detailing — cost-volume-profit: break-even at 120 details a month

To the **left** of 120 details the total-cost line is above the total-revenue line, and the shaded wedge between them is the **loss**; to the **right** the revenue line is above, and the wedge is the **profit**. The wedge widens in both directions at \$50 per detail — the contribution margin — which is why 160 details produces the \$2 000 target profit and why the 200-detail budget leaves an **80-detail margin of safety** before the business would fall back to break-even.

The break-even formula itself is a division, and the reason is worth seeing:

Brightwave Car Detailing

Where the break-even formula comes from

one detail sold — selling price \$80

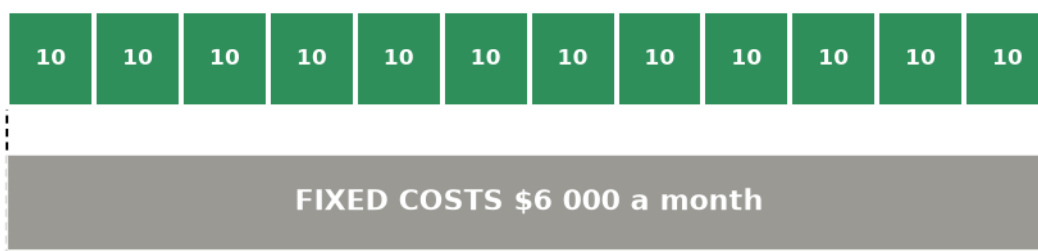
$$\$80 - \$30 = \$50$$

variable cost per unit

CONTRIBUTION MARGIN per unit



$$120 \text{ details} \times \$50 \text{ contribution} = \$6\,000$$



the two bars are the same length because the contribution exactly covers the fixed costs — which is all the formula says: break-even units = $\$6\,000 \div \$50 = 120$ details

Brightwave Car Detailing — where the break-even formula comes from

Each detail sold contributes \$50 towards the fixed costs, so the question “how many do we need?” is just “how many \$50 contributions fill \$6 000?”. The two bars are the same length because $120 \times \$50$ is exactly \$6 000 — which is all that **fixed costs ÷ contribution margin per unit** says. Every detail sold *after* that point has no fixed costs left to cover, so its whole \$50 goes to profit.

Worked examples (scaffolded)

Example 1 — contribution margin, break-even (units and \$) and a target profit

Summit Print Co sells a printed banner for \$45. The variable cost of each banner (vinyl and ink) is \$18, and fixed costs are \$8 100 per month. The owner wants to know the break-even point and the volume needed for a \$5 400 target profit.

Working	Comment
Contribution margin = $\$45 - \$18 = \$27$ per banner.	Selling price – variable cost per unit. Only the <i>variable</i> cost is deducted.
Contribution margin ratio = $\$27 \div \$45 = 0.6$ (60%).	Each sales dollar contributes 60 cents towards fixed costs and profit.
Break-even (units) = $\$8\,100 \div \$27 = 300$ banners.	Fixed costs ÷ contribution margin per unit. 300 banners cover the \$8 100 of fixed costs exactly.
Break-even (\$) = $300 \times \$45 = \$13\,500$ (check: $\$8\,100 \div 0.6 = \$13\,500$).	Break-even units × price, cross-checked using the contribution margin ratio.
Target profit \$5 400: $(\$8\,100 + \$5\,400) \div \$27 = \$13\,500 \div \$27 = 500$ banners.	Add the target profit to fixed costs, then divide by the margin.
Sales revenue for the target = $500 \times \$45 = \$22\,500$.	The dollar sales needed to earn \$5 400 profit.

Units sold	Sales revenue \$	Variable costs \$	Contribution margin \$	Fixed costs \$	Profit / (loss) \$
0	0	0	0	8 100	(8 100)
150	6 750	2 700	4 050	8 100	(4 050)

Units sold	Sales revenue \$	Variable costs \$	Contribution margin \$	Fixed costs \$	Profit / (loss) \$
300	13 500	5 400	8 100	8 100	0
450	20 250	8 100	12 150	8 100	4 050
600	27 000	10 800	16 200	8 100	8 100

The schedule confirms the break-even at 300 banners (profit 0) and shows the business passing a \$5 400 profit somewhere between 450 and 600 banners — precisely at the 500 banners the target formula gave.

Example 2 — margin of safety, then modelling a price rise

Riverbend Yoga sells a class pass for \$25. The variable cost per pass (mat hire, towel laundering and refreshments) is \$5, and fixed costs are \$4 000 per month. The owner budgets to sell 250 passes and is considering raising the price to \$30.

Working	Comment
Contribution margin = \$25 – \$5 = \$20 per pass.	Selling price – variable cost per unit.
Break-even (units) = \$4 000 ÷ \$20 = 200 passes (\$5 000).	Fixed costs ÷ contribution margin; break-even \$ = 200 × \$25.
Margin of safety = 250 – 200 = 50 passes = \$1 250 .	Budgeted sales – break-even. Ratio = 50 ÷ 250 = 20% — sales could fall 20% before a loss.
Profit at 250 passes = (250 × \$20) – \$4 000 = \$1 000 .	Total contribution – fixed costs.
Model — price to \$30 (variable cost unchanged): new contribution margin = \$30 – \$5 = \$25 .	A higher price lifts the margin, so fewer units are needed.
New break-even = \$4 000 ÷ \$25 = 160 passes (\$4 800); new margin of safety at 250 = 90 passes = \$2 700 (36%).	Break-even falls by 40 passes and the safety buffer widens.
New profit at 250 = (250 × \$25) – \$4 000 = \$2 250 — an increase of \$1 250 .	Holding volume at 250, the price rise adds \$5 of margin × 250 passes = \$1 250.

∴ if demand holds, the \$5 price rise lowers the break-even point to 160 passes and lifts profit at the budgeted volume from \$1 000 to \$2 250. The owner should weigh this against the risk that the higher price reduces the number of passes sold.

Worked examples (unscaffolded)

Example 3 — target profit, then modelling a rise in fixed costs

Coastline Kayak Tours sells a guided-tour seat for \$60. The variable cost per seat (fuel, snacks and safety-gear cleaning) is \$24 and fixed costs are \$9 000 per month.

The contribution margin is \$60 – \$24 = \$36 per seat, so the break-even point is \$9 000 ÷ \$36 = **250 seats** (250 × \$60 = **\$15 000**). To earn a target profit of \$5 400 the business must sell (\$9 000 + \$5 400) ÷ \$36 = \$14 400 ÷ \$36 = **400 seats**, i.e. \$24 000 of sales.

If the operator takes out new guide insurance that raises fixed costs by \$1 800 to \$10 800, the contribution margin is unchanged at \$36, but the break-even point rises to \$10 800 ÷ \$36 = **300 seats** — 50 more seats than before, purely to cover the extra \$1 800 of fixed cost (\$1 800 ÷ \$36 = 50).

Units sold	Sales revenue \$	Variable costs \$	Contribution margin \$	Fixed costs \$	Profit / (loss) \$
0	0	0	0	9 000	(9 000)
125	7 500	3 000	4 500	9 000	(4 500)
250	15 000	6 000	9 000	9 000	0
375	22 500	9 000	13 500	9 000	4 500

Units sold	Sales revenue \$	Variable costs \$	Contribution margin \$	Fixed costs \$	Profit / (loss) \$
500	30 000	12 000	18 000	9 000	9 000

∴ at the original fixed costs the business breaks even at 250 seats and needs 400 seats for a \$5 400 profit; the extra insurance lifts the break-even point to 300 seats.

Example 4 — margin of safety, then modelling a rise in variable cost

Meadow Lawn Care sells a lawn-mow service for \$40. The variable cost per mow (fuel, blade wear and green-waste disposal) is \$16 and fixed costs are \$3 600 per month. The owner budgets to sell 200 mows.

The contribution margin is $\$40 - \$16 = \$24$, so the break-even point is $\$3\,600 \div \$24 = \mathbf{150 \text{ mows}}$ (\$6 000). At the budgeted 200 mows the margin of safety is $200 - 150 = \mathbf{50 \text{ mows}}$ = \$2 000 (25%), and profit is $(200 \times \$24) - \$3\,600 = \mathbf{\$1\,200}$.

Suppose the fuel supplier raises prices, lifting the variable cost per mow to \$20. The contribution margin falls to $\$40 - \$20 = \$20$, so the break-even point rises to $\$3\,600 \div \$20 = \mathbf{180 \text{ mows}}$. At the same budgeted 200 mows the margin of safety shrinks to $200 - 180 = \mathbf{20 \text{ mows}}$ = \$800 (10%), and profit falls to $(200 \times \$20) - \$3\,600 = \mathbf{\$400}$.

∴ the \$4 rise in variable cost cuts the contribution margin by \$4 a mow, lifts the break-even point by 30 mows and more than halves both the profit (\$1 200 → \$400) and the safety buffer (50 → 20 mows) at the budgeted volume — a reminder that a small per-unit cost creep has a large effect when the margin is thin.

Practice questions — scaffolded

Question 1

Harbour Bike Hire charges \$18 for a hire session. The variable cost per session (cleaning and minor repairs) is \$6, and fixed costs are \$3 000 per month.

- Calculate the contribution margin per session.
- Calculate the break-even point in sessions.
- Calculate the break-even point in dollars.

Question 2

Aurora Nail Studio charges \$50 for a service. The variable cost per service (polish and consumables) is \$14, and fixed costs are \$5 400 per month.

- Calculate the contribution margin per service.
- Calculate the break-even point in services.
- Calculate the number of services needed to earn a target profit of \$3 600.

Question 3

Pinehill Tutoring charges \$45 for a lesson. The variable cost per lesson (printed materials) is \$9, and fixed costs are \$5 040 per month. The owner budgets to sell 180 lessons.

- Calculate the contribution margin per lesson.
- Calculate the break-even point in lessons.
- Calculate the margin of safety in lessons and in dollars at the budgeted volume.

Question 4

Cobalt Web Studio sells a website package for \$200. The variable cost per package (hosting set-up and stock images) is \$80, and fixed costs are \$12 000 per month.

- Calculate the contribution margin ratio.

- b. Using the ratio, calculate the break-even point in dollars.
- c. Calculate the number of packages needed to earn a target profit of \$6 000.

Question 5

Sunset Cinema Club sells a ticket for \$16. The variable cost per ticket (refreshment voucher and booking fee) is \$4, and fixed costs are \$4 800 per month.

- a. Calculate the break-even point in tickets.
- b. The landlord raises the rent, lifting fixed costs to \$5 400. Calculate the new break-even point in tickets.
- c. State the effect of the rent rise on the break-even point.

Question 6

Fernvale Pottery Classes charges \$35 for a class. The variable cost per class (clay and glaze) is \$11, and fixed costs are \$4 320 per month.

- a. Calculate the contribution margin per class and the break-even point in classes.
- b. The owner raises the price to \$41 (variable cost unchanged). Calculate the new break-even point in classes.
- c. Explain why raising the price lowers the break-even point.

Practice questions — unscaffolded

Question 7

Driftwood Surf School charges \$55 for a lesson. The variable cost per lesson (board wax and safety gear) is \$19, and fixed costs are \$7 200 per month. Calculate the contribution margin, the break-even point in lessons and the break-even point in dollars.

Question 8

Lumen Photography charges \$120 for a session. The variable cost per session (prints and travel) is \$30, and fixed costs are \$9 000 per month. Calculate the contribution margin and the break-even point in sessions, then calculate the number of sessions and the sales revenue needed to earn a target profit of \$4 500.

Question 9

Grove Cafe Catering sells a catering platter for \$25. The variable cost per platter (ingredients and packaging) is \$13, and fixed costs are \$3 600 per month. The owner budgets to sell 400 platters. Calculate the break-even point in platters, and the margin of safety in platters, in dollars and as a percentage at the budgeted volume.

Question 10

Ironbark Furniture Repairs charges \$90 for a repair. The variable cost per repair (materials and consumables) is \$30 and fixed costs are \$7 200 per month; the business expects to complete 200 repairs. A supplier price rise lifts the variable cost per repair to \$42. Calculate the break-even point in repairs and the expected profit both before and after the cost rise, and comment on the effect.

Question 11

Skyline Window Cleaning charges \$72 for a job. The variable cost per job (detergents and travel) is \$22 and fixed costs are \$6 000 per month; the business expects to complete 200 jobs. The owner is considering raising the price to \$82 with the variable cost unchanged. Calculate the break-even point in jobs and the expected profit at 200 jobs both before and after the price rise, and state one caution the owner should keep in mind about the price change.

Question 12

Verde Landscaping sells a garden-design service for \$150. The variable cost per design (plants and materials) is \$54, and fixed costs are \$14 400 per month. The owner budgets to sell 300 designs. Calculate: (i) the contribution margin;

(ii) the break-even point in designs and in dollars; (iii) the number of designs and the sales revenue needed for a target profit of \$9 600; and (iv) the margin of safety in designs, in dollars and as a percentage at the budgeted volume.

Question 13

Halcyon Massage charges \$85 for a service with a variable cost per service of \$25. The business breaks even at 90 services per month. Calculate the monthly fixed costs, and then the number of services needed to earn a target profit of \$3 000.

Question 14

Beacon Bookkeeping has fixed costs of \$4 800 per month and a variable cost of \$20 per job. The owner wants the business to break even at 120 jobs per month. Calculate the contribution margin per job the business must achieve, and hence the selling price it must charge for each job.

Question 15

Tidewater Boat Wash charges \$50 for a wash with a variable cost per wash of \$18 and fixed costs of \$6 400 per month. From next month the price will rise to \$54 and the variable cost will rise to \$22. Calculate the break-even point in washes and in dollars both before and after the changes, and explain why the break-even point in units is unchanged while the break-even point in dollars rises.

Question 16

Distinguish between a **fixed cost** and a **variable cost**, giving one example of each for a service business, and explain why only the variable cost per unit is deducted when calculating the contribution margin.

Question 17

Explain what the **margin of safety** tells the owner of a business, and explain why a business with a **small** margin of safety is exposed to more risk than one with a large margin of safety.

Question 18

Northcrest Cleaning is applying for a bank loan to expand. In preparing the break-even analysis for the loan application, the owner is tempted to record the variable cost per job as \$15 rather than the true \$25, and to omit \$1 200 of monthly fixed insurance costs, so that the analysis shows a much lower break-even point and makes the business look less risky. **Discuss** this practice with reference to a relevant qualitative characteristic, and explain **one** consequence for the lender and **one** consequence for the business itself.

Answers

1.
 - a. \$12 b. 250 sessions c. \$4 500
2.
 - a. \$36 b. 150 services c. 250 services
3.
 - a. \$36 b. 140 lessons c. 40 lessons = \$1 800
4.
 - a. 0.6 (60%) b. \$20 000 c. 150 packages
5.
 - a. 400 tickets b. 450 tickets c. the break-even point rises by 50 tickets
6.
 - a. \$24; 180 classes b. 144 classes c. see solutions
7. Contribution margin \$36; break-even 200 lessons; \$11 000
8. Contribution margin \$90; break-even 100 sessions; 150 sessions = \$18 000 for the target profit
9. Break-even 300 platters; margin of safety 100 platters = \$2 500 = 25%
10. Break-even 120 → 150 repairs; profit at 200 falls from \$4 800 to \$2 400
11. Break-even 120 → 100 jobs; profit at 200 rises from \$4 000 to \$6 000 (+\$2 000)
12. \$96; 150 designs = \$22 500; 250 designs = \$37 500; margin of safety 150 designs = \$22 500 = 50%
13. Fixed costs \$5 400; 140 services
14. Contribution margin \$40; selling price \$60
15. Before: 200 washes = \$10 000; after: 200 washes = \$10 800
16. See solutions
17. See solutions
18. See solutions

Fully-worked solutions

Question 1

- a. Contribution margin = $\$18 - \$6 = \$12$ per session.
- b. Break-even = $\$3\,000 \div \$12 = \mathbf{250\ sessions}$.
- c. Break-even (\$) = $250 \times \$18 = \mathbf{\$4\,500}$.

Question 2

- a. Contribution margin = $\$50 - \$14 = \$36$ per service.
- b. Break-even = $\$5\,400 \div \$36 = \mathbf{150\ services}$.
- c. Target profit = $(\$5\,400 + \$3\,600) \div \$36 = \$9\,000 \div \$36 = \mathbf{250\ services}$.

Question 3

- a. Contribution margin = $\$45 - \$9 = \$36$ per lesson.
- b. Break-even = $\$5\,040 \div \$36 = \mathbf{140\ lessons}$.
- c. Margin of safety = $180 - 140 = \mathbf{40\ lessons} = 40 \times \$45 = \mathbf{\$1\,800}$ (a ratio of $40 \div 180 \approx 22.2\%$).

Question 4

- a. Contribution margin = $\$200 - \$80 = \$120$; contribution margin ratio = $\$120 \div \$200 = \mathbf{0.6\ (60\%)}$.
- b. Break-even (\$) = $\$12\,000 \div 0.6 = \mathbf{\$20\,000}$ (a check: $\$20\,000 \div \$200 = 100$ packages, and $100 \times \$120 = \$12\,000$ of contribution).
- c. Target profit = $(\$12\,000 + \$6\,000) \div \$120 = \$18\,000 \div \$120 = \mathbf{150\ packages}$.

Question 5

- a. Break-even = $\$4\,800 \div (\$16 - \$4) = \$4\,800 \div \$12 = \mathbf{400\ tickets}$.
- b. New break-even = $\$5\,400 \div \$12 = \mathbf{450\ tickets}$.
- c. Fixed costs rose by \$600 while the contribution margin was unchanged, so the break-even point **increased by 50 tickets** ($\$600 \div \12). A rise in fixed costs raises the break-even point without changing the contribution margin.

Question 6

- a. Contribution margin = $\$35 - \$11 = \mathbf{\$24}$; break-even = $\$4\,320 \div \$24 = \mathbf{180\ classes}$.
- b. New contribution margin = $\$41 - \$11 = \$30$; new break-even = $\$4\,320 \div \$30 = \mathbf{144\ classes}$.
- c. Raising the price lifts the contribution margin per class from \$24 to \$30, so **each class now covers more of the fixed costs** — fewer classes (144 rather than 180) are needed to cover the same \$4 320 of fixed costs, lowering the break-even point.

Question 7

Contribution margin = $\$55 - \$19 = \mathbf{\$36}$ per lesson. Break-even = $\$7\,200 \div \$36 = \mathbf{200\ lessons}$. Break-even (\$) = $200 \times \$55 = \mathbf{\$11\,000}$.

Question 8

Contribution margin = $\$120 - \$30 = \mathbf{\$90}$ per session. Break-even = $\$9\,000 \div \$90 = \mathbf{100\ sessions}$. Target profit = $(\$9\,000 + \$4\,500) \div \$90 = \$13\,500 \div \$90 = \mathbf{150\ sessions}$, i.e. $150 \times \$120 = \mathbf{\$18\,000}$ of sales.

Question 9

Contribution margin = $\$25 - \$13 = \$12$. Break-even = $\$3\,600 \div \$12 = \mathbf{300\ platters}$. Margin of safety = $400 - 300 = \mathbf{100\ platters}$ = $100 \times \$25 = \mathbf{\$2\,500}$ = $100 \div 400 = \mathbf{25\%}$. Sales could fall by a quarter before the business made a loss.

Question 10

Contribution margin (before) = $\$90 - \$30 = \$60$; break-even = $\$7\,200 \div \$60 = \mathbf{120\ repairs}$; profit at 200 repairs = $(200 \times \$60) - \$7\,200 = \$12\,000 - \$7\,200 = \mathbf{\$4\,800}$.

After the cost rise, contribution margin = $\$90 - \$42 = \$48$; break-even = $\$7\,200 \div \$48 = \mathbf{150\ repairs}$; profit at 200 = $(200 \times \$48) - \$7\,200 = \$9\,600 - \$7\,200 = \mathbf{\$2\,400}$.

The \$12 rise in variable cost cuts the contribution margin by \$12, so the break-even point rises by 30 repairs ($120 \rightarrow 150$) and profit at the expected volume halves ($\$4\,800 \rightarrow \$2\,400$). The business would need to sell more, cut costs elsewhere or raise its price to restore its position.

Question 11

Contribution margin (before) = $\$72 - \$22 = \$50$; break-even = $\$6\,000 \div \$50 = \mathbf{120\ jobs}$; profit at 200 jobs = $(200 \times \$50) - \$6\,000 = \$10\,000 - \$6\,000 = \mathbf{\$4\,000}$.

After the price rise, contribution margin = $\$82 - \$22 = \$60$; break-even = $\$6\,000 \div \$60 = \mathbf{100\ jobs}$; profit at 200 = $(200 \times \$60) - \$6\,000 = \$12\,000 - \$6\,000 = \mathbf{\$6\,000}$.

Holding volume at 200 jobs, the \$10 price rise lifts the contribution margin by \$10, lowers the break-even point by 20 jobs and raises profit by **\$2 000**. **Caution:** the model assumes the same 200 jobs are sold at the higher price — a \$10 increase may reduce demand, so the owner should not assume the extra profit is certain without considering how customers will respond.

Question 12

- (i) Contribution margin = $\$150 - \$54 = \mathbf{\$96}$ per design.
- (ii) Break-even = $\$14\,400 \div \$96 = \mathbf{150\ designs}$; in dollars = $150 \times \$150 = \mathbf{\$22\,500}$.

(iii) Target profit = $(\$14\,400 + \$9\,600) \div \$96 = \$24\,000 \div \$96 = \mathbf{250\ designs}$, i.e. $250 \times \$150 = \mathbf{\$37\,500}$ of sales.

(iv) Margin of safety = $300 - 150 = \mathbf{150\ designs}$ = $150 \times \$150 = \mathbf{\$22\,500}$ = $150 \div 300 = \mathbf{50\%}$.

Question 13

Contribution margin = $\$85 - \$25 = \$60$. Because the business breaks even at 90 services, the fixed costs equal the contribution earned at break-even: fixed costs = $90 \times \$60 = \mathbf{\$5\,400}$. For a target profit of $\$3\,000$: $(\$5\,400 + \$3\,000) \div \$60 = \$8\,400 \div \$60 = \mathbf{140\ services}$.

Question 14

To break even at 120 jobs the total contribution must equal the fixed costs, so the contribution margin per job = $\$4\,800 \div 120 = \mathbf{\$40}$. Because contribution margin = selling price – variable cost, the selling price must be $\$20 + \$40 = \mathbf{\$60}$ per job.

Question 15

Before: contribution margin = $\$50 - \$18 = \$32$; break-even = $\$6\,400 \div \$32 = \mathbf{200\ washes}$ = $200 \times \$50 = \mathbf{\$10\,000}$.

After: contribution margin = $\$54 - \$22 = \$32$ (unchanged — the price and the variable cost both rose by the *same* \$4); break-even = $\$6\,400 \div \$32 = \mathbf{200\ washes}$ = $200 \times \$54 = \mathbf{\$10\,800}$.

The break-even point in **units** depends on the contribution margin per unit, which is unchanged because the \$4 price rise and the \$4 cost rise cancel out — so 200 washes still cover the \$6 400 of fixed costs. The break-even point in **dollars** rises from \$10 000 to \$10 800 because the same 200 washes are now sold at the higher price of \$54 ($200 \times \54), so more sales *revenue* passes through the business to reach the same break-even quantity.

Question 16

A **fixed cost** stays the same in total regardless of the number of units sold within the period — for a service business, the monthly **rent** or **insurance** is a fixed cost. A **variable cost** changes in total in direct proportion to the number of units sold but stays the same per unit — for example, the **consumable materials used on each job** (cleaning agents, printing materials). Only the variable cost per unit is deducted in the contribution margin because the contribution margin measures what selling **one more unit** adds towards covering fixed costs and profit: selling an extra unit brings in the selling price and incurs only the extra variable cost, while the fixed costs do not change with that one decision. The fixed costs are then covered *collectively* by the total contribution of all units sold, which is why they are handled through the break-even calculation rather than deducted unit by unit.

Question 17

The **margin of safety** tells the owner how far current or budgeted sales sit **above the break-even point** — that is, how far sales could **fall before the business begins to make a loss**. It can be expressed in units, in dollars or as a percentage of budgeted sales. A business with a **small** margin of safety is closer to its break-even point, so even a **small drop in sales** — a quiet month, the loss of a few customers, or a modest cost rise that lifts the break-even point — could tip it into a loss. A business with a **large** margin of safety can absorb a bigger downturn before it makes a loss, so it is **lower risk** and has more room to withstand adverse conditions. The margin of safety therefore helps the owner judge how much protection the current sales level provides and whether action is needed to lift sales or cut the break-even point.

Question 18

Understating the variable cost per job (\$15 instead of the true \$25) and omitting \$1 200 of fixed insurance costs breaches the **faithful representation** characteristic, which requires information to be **complete, free from material error and neutral (without bias)**; it also fails **verifiability**, because the figures cannot be traced to genuine invoices and contracts. The \$10 understatement inflates the contribution margin per job by \$10, and the omitted \$1 200 leaves less fixed cost for that contribution to cover, so the owner produces a break-even point far lower than the business can actually achieve. **Consequence for the lender:** relying on the distorted analysis, the bank may approve a loan it would otherwise decline, misjudging the risk and facing a greater chance the business cannot repay. **Consequence for the business:** the real break-even quantity does not change just because it was misreported — the business must still sell the *true* number of jobs to cover its *actual* costs, so it may take on debt it cannot service, damage its relationship

with the lender and risk being unable to pay suppliers and employees. Honest, evidence-based figures are essential: a decision built on manipulated inputs harms the very owner who manipulated them.

Topic 1 Test A — Recording and analysis

Reading time: 10 minutes · Writing time: 50 minutes · 50 marks · A scientific calculator may be used.

This test is cumulative over Chapters 1–5 (the nature and role of accounting, the accounting equation and the Balance Sheet, business ownership and investment, sources of finance, and price-setting strategies).

Question 1 (12 marks)

Vellmore Physiotherapy (owner K. Vellmore) is a sole-proprietor service business. At 30 June 2027 the business had the following items, in no particular order: Bank \$7 000; Accounts Receivable \$5 000; Prepaid insurance \$1 000 (cover expiring in eight months); Supplies \$2 000; Equipment \$26 000; Motor vehicle \$34 000; Accounts Payable \$4 000; GST Clearing \$1 000; a Loan – Kestrel Bank of \$25 000, of which \$5 000 is repayable within the next 12 months and \$20 000 beyond. During the year the business earned a net profit of \$13 000; the owner’s opening Capital was \$40 000 and drawings for the year were \$8 000.

- a. Prepare a classified Balance Sheet as at 30 June 2027, calculating the owner’s closing Capital and splitting the Loan across the correct sections. 7 marks
- b. Calculate the **Debt Ratio** and the **Working Capital Ratio** of the business. 3 marks
- c. Interpret the two indicators, commenting on the business’s short-term liquidity and its reliance on outside finance. 2 marks

Question 2 (8 marks)

A newly appointed assistant at *Larkhill Design* (owner M. Larkhill), a sole-proprietor service business, makes several suggestions while the 30 June 2027 reports are being prepared.

- a. The owner paid the \$780 registration on her **private** car from the business bank account, and the assistant has recorded it as an “Insurance” expense of the business. Name the accounting assumption this treatment breaches, and explain how the \$780 should be recorded. 3 marks
- b. The assistant wants to record the office fit-out (which cost \$18 000) in the Balance Sheet at \$25 000 — the amount the owner “reckons a buyer would pay for it” — even though there is no independent evidence supporting \$25 000. Identify the qualitative characteristic this most threatens, and explain why. 3 marks
- c. The owner asks why the business prepares reports every 12 months rather than waiting until the business is eventually wound up, and why the delivery van is reported at cost less accumulated depreciation rather than at the amount it would fetch in an immediate forced sale. Referring to the relevant assumption(s), explain. 2 marks

Question 3 (10 marks)

Renata has funds to invest for **one year** and is comparing four alternatives. The amounts committed and the expected returns differ greatly, so she decides to compare them using **return on investment (ROI)**.

Investment option	Amount invested \$	Expected return for the year
Cash — term deposit	25 000	interest \$1 000
Property	360 000	net rent \$14 400 + capital growth \$7 200
Shares	30 000	dividends \$900 + capital growth \$3 300
Cryptocurrency	8 000	capital growth \$2 800 (no income)

- a. Calculate the return on investment (%) of each of the four options. 4 marks
- b. Rank the four options from the highest ROI to the lowest. 1 mark

c. Renata instead requires an ROI of **9%** on the **\$180 000** she is considering putting into her own business. Calculate the net profit the business must earn to meet her required ROI. 2 marks

d. Discuss why Renata should **not** simply choose the option with the highest ROI, with reference to **risk** and **liquidity**. 3 marks

Question 4 (4 marks)

Brightwater Pool Cleaning (owner D. Brightwater) is a service business that sells one service — a pool clean — for \$60. The variable cost per clean (chemicals, fuel and consumables) is \$24, and the fixed costs of the business are \$7 200 per month.

a. Calculate the contribution margin per clean, and the break-even point in cleans and in dollars. 2 marks

b. The owner is considering raising the price to **\$64** (the variable cost is unchanged). Model the effect of this change on the contribution margin per clean and on the break-even point in cleans. 2 marks

Question 5 (6 marks)

Wrenfield Mobile Mechanics (owner T. Wrenfield) is a newly established sole-proprietor service business. Wrenfield left a salaried job to start it, drawn by the independence of being his own boss and the prospect of a better financial return. To get the business going he needed **\$60 000**: he contributed **\$25 000** of his own savings and borrowed the remaining **\$35 000** from a bank. He has chosen a highly visible base on a busy arterial road, but he has little experience running a business, and the loan is large relative to his own contribution. Before committing, he consulted an **accountant** about his budgeted cash flows.

a. Discuss the factors that may affect the success or failure of *Wrenfield Mobile Mechanics*, referring to at least **one financial** and **one non-financial** factor drawn from the scenario. 3 marks

b. Wrenfield's \$60 000 of start-up finance comes from two different sources. Distinguish between **internally** and **externally** sourced finance, using Wrenfield's two amounts as examples, and state briefly when each source is most suitable. 2 marks

c. State **one** way the **accountant** Wrenfield consulted could help improve the business's chance of success. 1 mark

Question 6 (10 marks)

Kelso Electrical (owner N. Kelso) is a **sole proprietor** that has grown from domestic call-outs into commercial fit-out work. One faulty commercial installation could produce a claim far larger than the business is worth, and Kelso is uneasy that his **house** stands behind every job he signs. He needs about **\$150 000** for a second van, new tooling and a licensed apprentice, and has two willing backers: a former colleague who wants to **work in** the business, and an aunt who will **put in money only** and take no part in running it. Neither wants the business's shares offered to the general public.

a. Distinguish a **sole proprietor** from a **private company** (*Pty Ltd*) in terms of **ownership** and **liability**. 3 marks

b. Recommend the most suitable ownership structure for *Kelso Electrical*, and justify your recommendation with **two** reasons drawn from the scenario. 4 marks

c. Kelso's accountant explains that, unlike a listed public company, a *Pty Ltd* does **not** have to publish its financial reports. Kelso replies that this suits him: when he asks the bank for equipment finance and asks his aunt for her money, he intends to show them the business's fee income but say nothing about the \$40 000 still owing on his existing van loan. Discuss the ethical considerations raised by Kelso's intention, referring to the **purpose** of a private company's reduced disclosure and to the interests of the **lender** and the **incoming shareholder**. 3 marks

Topic 1 Test A — solutions

Question 1

- a. The owner's claim is built up by the profit earned for him and reduced by what he takes out, so the closing Capital is $\$40\,000 + \$13\,000 - \$8\,000 = \mathbf{\$45\,000}$, reported as the single Owner's Equity figure.

Balance Sheet of Vellmore Physiotherapy as at 30 June 2027

	\$	\$
Current Assets		
Bank	7 000	
Accounts Receivable	5 000	
Prepaid insurance	1 000	
Supplies	2 000	15 000
Non-Current Assets		
Equipment	26 000	
Motor vehicle	34 000	60 000
Total Assets		75 000
Current Liabilities		
Accounts Payable	4 000	
GST Clearing	1 000	
Loan – Kestrel Bank (current portion)	5 000	10 000
Non-Current Liabilities		
Loan – Kestrel Bank		20 000
Total Liabilities		30 000
Owner's Equity		
Capital		45 000
Total Liabilities and Owner's Equity		75 000

The report balances: Total Assets \$75 000 = Total Liabilities \$30 000 + Owner's Equity \$45 000. The \$5 000 of the loan due within 12 months is shown as a current liability and the \$20 000 due later as a non-current liability.

- b. **Debt Ratio** = total liabilities ÷ total assets $\times 100 = \$30\,000 \div \$75\,000 \times 100 = \mathbf{40\%}$. **Working Capital Ratio** = current assets ÷ current liabilities = $\$15\,000 \div \$10\,000 = \mathbf{1.5 : 1}$.
- c. The Working Capital Ratio of **1.5 : 1** means the business holds \$1.50 of current assets for every \$1 of current liabilities, so it **can meet its short-term debts** from its current assets, though the buffer is thinner than the 2 : 1 benchmark. The Debt Ratio of **40%** means outside parties finance 40 cents of every asset dollar and the owner the remaining **60%**, so the business is **lowly to moderately geared** — it relies more on the owner than on outside finance and carries a relatively modest level of risk.

Question 2

- a. Recording the \$780 private car registration as a business expense breaches the **accounting entity** assumption, under which the records of the business are kept **completely separate** from the personal affairs of the owner. The car is the owner's **private** asset, so its registration is a personal cost, not a cost incurred in earning the business's revenue. The \$780 should be recorded as **Drawings** — a withdrawal of business resources by the owner for private use — which reduces the owner's Capital rather than reducing the business's profit.
- b. The characteristic most threatened is **faithful representation**. To be a faithful representation, information must be **complete, free from material error and neutral** (without bias). The \$25 000 figure has **no**

independent, verifiable evidence behind it — it is only the owner's hopeful estimate — so recording it would not be free from material error and would not be neutral; it would **overstate** the asset to make the business look stronger than it is. The fit-out should be reported at its cost of \$18 000 (less any depreciation), which can be traced to a source document.

- c. Under the **period** assumption, the continuous life of the business is divided into periods of equal length (here, 12 months) so that profit can be determined and reports prepared for each period rather than waiting until the business closes. Under the **going concern** assumption, the business is assumed to continue operating into the future, so the delivery van — which will be used to earn revenue over several future periods — is reported at **cost less accumulated depreciation**; its forced-sale value would only be appropriate if the business were about to be wound up, which the going concern assumption assumes is not the case.

Question 3

- a. $\text{ROI} = (\text{return} \div \text{amount invested}) \times 100$:
- Cash (term deposit): $\$1\,000 \div \$25\,000 \times 100 = 4\%$.
 - Property: $\text{return} = \text{net rent } \$14\,400 + \text{growth } \$7\,200 = \$21\,600$; $\$21\,600 \div \$360\,000 \times 100 = 6\%$.
 - Shares: $\text{return} = \text{dividends } \$900 + \text{growth } \$3\,300 = \$4\,200$; $\$4\,200 \div \$30\,000 \times 100 = 14\%$.
 - Cryptocurrency: $\$2\,800 \div \$8\,000 \times 100 = 35\%$.
- b. Ranked from highest ROI to lowest: **cryptocurrency (35%)** → **shares (14%)** → **property (6%)** → **cash (4%)**.
- c. Rearranging $\text{ROI} = (\text{return} \div \text{amount invested}) \times 100$ gives $\text{required return} = 9\% \times \$180\,000 = \$16\,200$. Unless the business earns a net profit of at least \$16 200 for the year it will fall short of the 9% Renata expects of it.
- d. ROI measures only the **reward** per dollar invested; it says nothing about the **risk** taken to earn it or how easily the money can be recovered. The cryptocurrency's 35% is only an **expectation**, and the asset is highly **volatile** — over Renata's single year the outcome could just as easily be a steep loss, whereas the term deposit's 4% is fixed by the bank in advance, so a high but uncertain return may be worth less to her than a lower but reliable one. **Liquidity** also matters: cash and shares can be turned back into money quickly and near their value, whereas property (and a private business) are **illiquid** — slow to sell and often only at a discount — so an investor who may need the funds soon cannot afford to lock them into an illiquid option, however high its ROI. Renata should therefore use ROI to compare the reward of each option, then weigh that reward against its risk, its liquidity and her own circumstances (her time horizon and whether she needs steady income or can wait for growth) before choosing — so the highest-ROI option is not automatically the best.

Question 4

- a. $\text{Contribution margin} = \text{selling price} - \text{variable cost} = \$60 - \$24 = \36 per clean. Break-even (cleans) = $\text{fixed costs} \div \text{contribution margin} = \$7\,200 \div \$36 = 200$ cleans. Break-even (\$) = $200 \times \$60 = \$12\,000$.
- b. Raising the price to \$64 (variable cost unchanged) lifts the contribution margin to $\$64 - \$24 = \$40$ per clean. Because each clean now contributes more towards the fixed costs, the break-even point **falls** to $\$7\,200 \div \$40 = 180$ cleans — 20 fewer than at the old price.

Question 5

- a. Whether *Wrenfield Mobile Mechanics* succeeds or fails will depend on a combination of **financial** and **non-financial** factors, several of which appear in the scenario. On the **non-financial** side, the business is helped by its **location** — a highly visible base on a busy arterial road attracts passing trade and callout work — but it is threatened by the owner's **limited management experience**, and management skill drives almost every other decision (pricing, cost control, cash-flow management and staffing), so inexperience is a genuine risk. On the **financial** side, Wrenfield has taken on a **large loan relative to his own contribution** (\$35 000 of the \$60 000), so the business is **highly geared**: the interest and repayments are a fixed commitment that must be met out of cash flow, and heavy borrowing raises the risk of failure if revenue is slow to build. The two also interact — an inexperienced owner may struggle to manage the cash flow needed to service the loan — so success turns on building revenue and controlling cash while the owner gains experience. (Any well-argued answer using at least one financial and one non-financial factor from the scenario is acceptable.)

- b. **Internally sourced finance** is finance provided from **within the business or from the owner's own funds** — here, the \$25 000 Wrenfield contributes from his savings as **owner's capital**; it creates **no liability**, carries **no interest** and never has to be repaid, but it is **limited to what the owner personally has**. **Externally sourced finance** is finance obtained from **outside the business and its owner** — here, the \$35 000 bank loan; it lets the business raise **more than the owner could provide alone**, but it creates a **liability** that must be **repaid, usually with interest**. Internal finance is most suitable when the business wants to keep its **debt and risk low** and the amount needed is within the owner's means; external finance is most suitable when the business must **raise more than the owner can provide** — for example to fund a large non-current asset — and can afford the repayments.
- c. The **accountant** could help by preparing and interpreting Wrenfield's **budgeted cash flows** (and later his reports and financial indicators), so that he can judge whether the business can service its loan and can spot problems — such as a looming cash shortage — early enough to act. (Any one reasonable role is acceptable, e.g. advising on pricing, budgeting, finance or tax obligations.)

Question 6

- a. A **sole proprietor** is a business **owned and controlled by one person**, who supplies the capital, keeps all the profit and makes all the decisions alone; it is **not a separate legal entity**, so the owner has **unlimited liability** — the owner is personally responsible for all the debts of the business and their private assets can be taken to pay them. A **private company** (*Pty Ltd*) is an **incorporated** business owned by **1 to 50 shareholders**; because it is a **separate legal entity**, its debts are its own and the shareholders have **limited liability** — a shareholder can lose only the amount paid for their shares, and their private assets are protected if the company fails.
- b. Kelso should **incorporate as a private company** (*Pty Ltd*). First, that structure answers the risk that worries him most. A company is a **separate legal entity**, so a claim arising from a faulty commercial installation would be a debt of the **company**, not of Kelso himself: his liability is **limited** to what he has paid for his shares and his **house is no longer exposed**, whereas as a sole proprietor he has **unlimited liability** and every asset he owns stands behind every job he signs. Second, a *Pty Ltd* may have up to **50 shareholders**, so it can accommodate **both** backers on the terms each of them wants: the former colleague can hold shares **and** work in the business, while the aunt can supply funds purely as an investor — and, unlike a **partner**, she would take on **no unlimited liability** for debts she has no hand in incurring. Because a private company's shares are **not offered to the general public**, the \$150 000 can be raised without a public float. (Kelso must accept the **set-up cost** and **ongoing compliance** obligations of a company, and as a shareholder he would be paid by **dividend** rather than helping himself to drawings — a fair price for protecting his house and funding the expansion.)
- c. The **privacy** of a *Pty Ltd* is a real and lawful advantage: because a private company does not offer its shares to the public, it is spared the cost and exposure of the continuous public reporting a listed company must provide. That concession exists because a private company deals with a **known, limited group** of owners and lenders who can ask it directly for what they need — **not** because its owner is free to mislead that group, which is exactly what Kelso proposes. Showing the bank and his aunt the fee income while suppressing \$40 000 of van finance produces a picture that is neither **complete** nor **neutral**: it understates the liabilities, understates the **Debt Ratio** and so overstates how much further borrowing the business could safely carry. The **lender** would be assessing the application on figures it has no way to check and could advance finance the business cannot service. The **aunt** is being asked to hand over her savings for shares in a business more heavily geared, and therefore riskier, than she has been told; she is also a family member relying on trust rather than on independent advice. The absence of public reporting makes Kelso's private honesty **more** important, not less. Ethically he owes both of them a duty to deal **honestly and in good faith** and to disclose what he knows they would treat as material, and the accountant preparing the figures owes the same duty and should decline to present them in that form. The intention is also poor commercial judgement: if the omission surfaces later, Kelso loses the banking relationship and the family goodwill his expansion depends on.

Topic 1 Test B — Short-answer recording

Reading time: 10 minutes · Writing time: 45 minutes · 40 marks · A scientific calculator may be used.

This test is cumulative over Chapters 1–5. Show all working; where a ratio is asked for, state it in the correct form.

Question 1 (8 marks)

Marlow Mowing (owner J. Marlow) is a sole-proprietor lawn-care service that began operating in September 2027 with no assets or liabilities. During September it recorded the following cash transactions:

- 1 Sep — the owner contributed \$40 000 cash as capital;
- 3 Sep — bought equipment for \$11 000 cash;
- 8 Sep — borrowed \$15 000 cash from Oakbank;
- 14 Sep — received \$3 600 cash for mowing fees;
- 21 Sep — paid wages \$2 100 cash;
- 27 Sep — the owner withdrew \$1 300 cash for private use.

a. Complete an effect-on-the-equation table (with columns Assets, Liabilities and Owner's equity) showing the effect of each of the six transactions. 6 marks

b. State the closing totals for Assets, Liabilities and Owner's equity at 30 September 2027, and confirm that $A = L + OE$. 2 marks

Question 2 (6 marks)

Pinevale Tutoring (owner S. Pinevale) has the following items at 30 June 2027: Bank \$3 000; Accounts Receivable \$4 000; Supplies \$1 000; Equipment \$15 000; Motor vehicle \$22 000; Accounts Payable \$3 000; GST Clearing \$2 000; Loan – Delta Credit Union \$12 000 (repayable over four years). The figure for Capital is missing.

a. Calculate the missing **Capital** as the residual. 2 marks

b. Prepare the **Current Assets** and **Current Liabilities** sections (an extract) of the classified Balance Sheet as at 30 June 2027. 2 marks

c. Calculate the **Working Capital Ratio** and state whether the business can meet its short-term debts. 2 marks

Question 3 (6 marks)

Ridgeline Homewares is a retail business that sets its prices by mark-up on cost.

a. The business buys a lamp for \$80 and applies a mark-up of 25% on cost. Calculate the mark-up in dollars, the selling price excluding GST, the GST added, and the GST-inclusive price the customer pays. 3 marks

b. The business buys a clock for \$60 and sells it for \$90 (excluding GST). Calculate the mark-up percentage on cost and the gross profit margin. 2 marks

c. State, in one sentence, why the mark-up percentage and the gross profit margin differ for the clock. 1 mark

Question 4 (6 marks)

Summit Yoga (owner R. Summit) is a service business that sells a class for \$30. The variable cost per class (mat hire, towel laundering and refreshments) is \$6, and fixed costs are \$4 800 per month. The owner budgets to sell **250** classes per month.

a. Calculate the contribution margin per class, and the break-even point in classes and in dollars. 3 marks

b. Calculate the number of classes needed to earn a target profit of \$2 400. 1 mark

c. Calculate the margin of safety in classes and as a percentage at the budgeted 250 classes. 2 marks

Question 5 (5 marks)

- a. *Fernbrook Removals* reports Total Liabilities of \$52 000 and Total Assets of \$80 000. Calculate the **Debt Ratio** and state the proportion of the assets financed by the owner. 2 marks
- b. *Glenire Cleaning* has a Debt Ratio of 30% and Total Assets of \$140 000. Calculate its **Total Liabilities** and its **Owner's Equity**. 2 marks
- c. State whether *Fernbrook Removals* is highly or lowly geared, giving one reason. 1 mark

Question 6 (5 marks)

- a. State the **four** accounting assumptions. 2 marks
- b. For **each** of the following, identify the accounting assumption **or** qualitative characteristic at work: **(i)** a sole proprietor records the owner's private grocery bill (paid from the business bank account) as Drawings; **(ii)** the reports are prepared and given to the owner within two weeks of the month's end, so the owner can act on them promptly. 2 marks
- c. State **one** difference between a **sole proprietor** and a **partnership**. 1 mark

Question 7 (4 marks)

- a. An investor contributes \$50 000 of capital to start a business, which earns a net profit of \$6 500 in its first year. Calculate the **return on investment**. 1 mark
- b. A share parcel produced a return of \$1 920 for the year at an ROI of 12%. Calculate the **amount invested**. 2 marks
- c. State **one** reason an investor might choose an option that does **not** have the highest ROI. 1 mark

Topic 1 Test B — solutions

Question 1

Transaction	Assets \$	Liabilities \$	Owner's equity \$
1 Sep — Bank +, Capital +	+40 000		+40 000
3 Sep — Equipment +, Bank —	+11 000 – 11 000 = 0		
8 Sep — Bank +, Loan +	+15 000	+15 000	
14 Sep — Bank +, Fees revenue	+3 600		+3 600
21 Sep — Bank –, Wages	–2 100		–2 100
27 Sep — Bank –, Drawings	–1 300		–1 300

Each transaction keeps $\Delta A = \Delta L + \Delta OE$, so the equation stays in balance.

b. Closing balances:

- Bank = \$40 000 – \$11 000 + \$15 000 + \$3 600 – \$2 100 – \$1 300 = \$44 200.
- **Assets** = Bank \$44 200 + Equipment \$11 000 = **\$55 200**.
- **Liabilities** = Loan – Oakbank = **\$15 000**.
- **Owner's equity** = Capital \$40 000 + \$3 600 (revenue) – \$2 100 (wages) – \$1 300 (drawings) = **\$40 200**.

A = L + OE: \$55 200 = \$15 000 + \$40 200. $\therefore$ the equation balances.

Question 2

- a. Total Assets = current (\$3 000 + \$4 000 + \$1 000 = \$8 000) + non-current (\$15 000 + \$22 000 = \$37 000) = \$45 000. Total Liabilities = current (Accounts Payable \$3 000 + GST Clearing \$2 000 = \$5 000) + non-current (Loan \$12 000) = \$17 000. **Capital = Assets – Liabilities = \$45 000 – \$17 000 = \$28 000.**

Balance Sheet of Pinevale Tutoring as at 30 June 2027 (extract)

	\$	\$
Current Assets		
Bank	3 000	
Accounts Receivable	4 000	
Supplies	1 000	8 000
Current Liabilities		
Accounts Payable	3 000	
GST Clearing	2 000	5 000

- c. Working Capital Ratio = current assets $\div$ current liabilities = \$8 000 $\div$ \$5 000 = **1.6 : 1**. The business holds \$1.60 of current assets for every \$1 of current liabilities, so it **can meet its short-term debts** from its current assets.

Question 3

- a. Mark-up \$ = cost $\times$ mark-up % = \$80 $\times$ 25% = **\$20**. Selling price (excl. GST) = \$80 + \$20 = **\$100**. GST = 10% $\times$ \$100 = **\$10**. GST-inclusive price = \$100 $\times$ 1.1 = **\$110** (the \$10 GST is exactly 1/11 of \$110).

- b. Mark-up \$ = $\$90 - \$60 = \$30$. **Mark-up %** = $\$30 \div \$60 = 50\%$ (measured against the cost). **Gross profit margin** = $\$30 \div \$90 = 33\frac{1}{3}\%$ (measured against the selling price).
- c. Each percentage divides the same \$30 of gross profit by a **different base** — the \$60 **cost** for the mark-up, but the larger \$90 **selling price** for the margin — so the mark-up figure (50%) is the higher of the two (33⅓%).

Question 4

- a. Contribution margin = $\$30 - \$6 = \$24$ per class. Break-even (classes) = $\$4\,800 \div \$24 = 200$ **classes**. Break-even (\$) = $200 \times \$30 = \$6\,000$.
- b. Classes for the target profit = $(\$4\,800 + \$2\,400) \div \$24 = \$7\,200 \div \$24 = 300$ **classes**.
- c. Margin of safety = budgeted – break-even = $250 - 200 = 50$ **classes** = $50 \div 250 = 20\%$ (in dollars, $50 \times \$30 = \$1\,500$). Sales could fall by 20% before the business made a loss.

Question 5

- a. Debt Ratio = total liabilities $\div$ total assets $\times 100 = \$52\,000 \div \$80\,000 \times 100 = 65\%$. The owner finances the remaining $100\% - 65\% = 35\%$ of the assets.
- b. Total Liabilities = $30\% \times \$140\,000 = \$42\,000$. Owner's Equity is the residual: $\$140\,000 - \$42\,000 = \$98\,000$ — the owner therefore finances the other 70% of the assets.
- c. *Fernbrook Removals* is **highly geared**: with 65 cents in every asset dollar supplied by outside parties, it depends far more on borrowed funds than on its owner, and the interest and repayments on that debt must be met whatever its trading results.

Question 6

- a. The four accounting assumptions are the **accounting entity** assumption, the **accrual basis** assumption, the **going concern** assumption and the **period** assumption.
- b. (i) the **accounting entity** assumption (the owner's private cost is kept out of the business's profit by recording it as Drawings); (ii) **timeliness** (the information reaches the owner in time to influence decisions).
- c. Any one difference, for example: a **sole proprietor** is owned by **one** person who bears the liability alone, whereas a **partnership** is owned by **two or more** people (2–20) who **share** ownership, control and profit and hold **joint** unlimited liability.

Question 7

- a. ROI = (return $\div$ amount invested) $\times 100 = (\$6\,500 \div \$50\,000) \times 100 = 13\%$.
- b. Amount invested = return $\div$ (ROI $\div 100$) = $\$1\,920 \div 0.12 = \$16\,000$.
- c. Any one reason, for example: the highest-ROI option may carry too much **risk** (its return is volatile and could become a loss), or it may be too **illiquid** (slow to turn back into cash), or it may not suit the investor's **time horizon or need for income** — so a lower but more reliable or more liquid return can be the better choice.