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Functional skills level 2 Maths exam practice notebook

(for all exam boards)

COMPANION TO THE LESSON NOTEBOOK

APPLY THE METHOD. EXPLAIN THE DECISION. CHECK THE RESULT.

Original practice for the shared Functional Skills Level 2 mathematics content in England.

28 topic sets	168 topic questions • 560 marks
6 mixed challenges	2 complete 60-mark mock papers
Writing and drawing space	Worked solutions and marking guidance

Name: _____

Tutor / centre: _____

Awarding organisation: _____

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About this practice notebook

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Shared content; independent materials

“For all exam boards” means the shared reformed Functional Skills Level 2 maths subject content used by Ofqual-regulated awarding organisations in England. This is not a curriculum guide for Scotland’s Core Skills or the different Essential Skills qualifications in Wales and Northern Ireland. It is not approved, endorsed or accredited by an awarding organisation, DfE or Ofqual. Trademarks belong to their respective owners.

The topic numbers match the 28 lessons in the companion lesson notebook. Each topic has 20 available practice marks. The mixed challenges and mock papers sample combinations of content; they do not predict which topics will appear in a live paper.

How the marks work

Topic sets are learning practice, not regulated assessments. Each original mock has 60 marks: 15 non-calculator and 45 calculator. Its author-assigned skill/problem-solving classification is 15 underpinning and 45 problem-solving marks. These proportions reflect the shared framework, but the paper layouts, question counts, timings and marking criteria are workbook choices, not replicas of any board’s assessment.

There is no official pass boundary for these mocks. Use results to diagnose learning needs. The marking notes give an original allocation for each stage; awarding bodies may use different accuracy and follow-through rules.

Rates, measurements and printing

Money, pay, tax, exchange and interest figures are invented exercise data. Use the stated factors and rates. Unless told otherwise, retain calculator precision and round only the final answer. For dimensions on grids, print at 100% or actual size; do not fit the page to a different size. Diagrams marked not to scale must not be measured.

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A ROUTE FROM TOPICS TO MOCK PAPERS

Use practice to improve

1 • Attempt before checking

Use the matching lesson first if you need to learn a method. Complete the practice independently with clear working. On topic Part A pages, follow the calculator instruction shown. Part B permits a calculator; diagrams may require a ruler and protractor.

2 • Mark the method

After finishing a whole set, consult the solutions. The numbers in brackets in solutions are marks for the stated stages. Accept another correct mathematical route. Record lost marks by cause: reading, method, calculation, units, accuracy or explanation.

3 • Repair and retry

Rewrite one incorrect solution fully and explain what changed. Retry it later without the answer visible. Then try a mixed challenge to find out whether you recognise the method in a different setting.

4 • Simulate an assessment

Sit a full mock without notes. Suggested timings are 30 minutes for its 15-mark non-calculator section and 90 minutes for its 45-mark calculator section. Follow the handover between sections. These are practice timings; your centre must confirm your actual assessment rules.

5 • Move to official materials

Use a current official sample or familiarisation test from your own awarding organisation. Confirm permitted equipment, calculator functions, onscreen tools and access arrangements with your centre. A workbook score cannot guarantee the result of a live exam.

EVERY CONTEXTUAL SOLUTION NEEDS A FINISH

Name the result and unit, compare it with the requirement, then state a supported decision. A bare “yes” or an unlabelled calculator number can leave the reasoning unclear.

For whole purchases, vehicles, packs or complete time units, interpret the fractional result. Buying enough may require rounding up; counting complete minutes or full objects may require rounding down. This is a decision about the context, not always ordinary nearest-value rounding.

CONTENTS AND ANSWER LOCATIONS

Find your practice

Section	Questions	Worked solutions
Diagnostic	7	8
Topic sets 1-28	9-64	85-112
Mixed challenges 1-6	65-70	113-115
Mock paper 1	71-77	116-118
Mock paper 2	78-84	119-121
Score tracker and error log	122-123	Use after marking
Sources and final checks	124-125	Official links
Visual solution guides	126-129	Drawings, charts and probability

Topic-set layout

Each topic has two question pages and one solution page. Part A has three focused questions worth 2 marks each. Part B has two applied questions worth 4 marks each and a connected problem worth 6 marks. Total: 20 marks per topic. The same question numbers continue from 1 to 6 across both pages.

How to locate any topic

Use the two-page map next. It gives the topic number and title, question pages and answer page. These numbers match the lesson notebook, so your tutor can direct you to a topic without changing the numbering between the books.

Writing and drawing

Write in the lined spaces. Use the supplied grids for plotting and construction. If you need extra paper, label it with the topic and question number. A drawing answer is checked using the dimensions, labels and features described in the solution. Numerical graph estimates may have a range of reasonable answers.

PERSONAL TARGET

My first topic to revisit: _____
The error I want to stop repeating: _____
How I will check it next time: _____

TOPICS 1-14

Topic and curriculum map

Topic numbers follow the 28 shared DfE Level 2 content points and the companion lessons. Additional inherited skills, such as charts, units, time and basic shape properties, are integrated into the questions. [S 1]

No.	Topic	Questions	Solutions
1	Numbers, place value and negatives	9-10	85
2	Whole-number calculation and checking	11-12	86
3	Expressions and formulae	13-14	87
4	Fractions, decimals and percentages	15-16	88
5	Percentages of amounts	17-18	89
6	Percentage change and original amounts	19-20	90
7	Adding, subtracting and ordering fractions	21-22	91
8	Fractions of quantities	23-24	92
9	Decimals and sensible accuracy	25-26	93
10	Calculating with decimals	27-28	94
11	Ratio and proportion	29-30	95
12	Order of operations and powers	31-32	96
13	Money, tax, budgets and compound interest	33-34	97
14	Units, conversion factors and graphs	35-36	98

Review prompt

Before starting a set, write the method you expect to need. After marking it, note whether the real difficulty was choosing the method or carrying out the calculation. Use the matching lesson’s coached example for a method gap; use targeted retry practice for a calculation gap.

TOPICS 15-28

Topic and curriculum map

Topic numbers follow the 28 shared DfE Level 2 content points and the companion lessons. Additional inherited skills, such as charts, units, time and basic shape properties, are integrated into the questions. [S 1]

No.	Topic	Questions	Solutions
15	Speed, density, pay and time	37-38	99
16	Perimeter, area and composite shapes	39-40	100
17	Volume and surface area	41-42	101
18	Scale drawings and actual dimensions	43-44	102
19	Coordinates in four quadrants	45-46	103
20	Solids, nets and views	47-48	104
21	Drawing solids, plans and elevations	49-50	105
22	Angles and geometric reasoning	51-52	106
23	Median, mode and organised data	53-54	107
24	Estimated mean from grouped data	55-56	108
25	Comparing data and evaluating charts	57-58	109
26	Combined events and two-way tables	59-60	110
27	Probability forms and expected frequencies	61-62	111
28	Scatter diagrams and correlation	63-64	112

Review prompt

Before starting a set, write the method you expect to need. After marking it, note whether the real difficulty was choosing the method or carrying out the calculation. Use the matching lesson’s coached example for a method gap; use targeted retry practice for a calculation gap.

18 MARKS • NOT AN OFFICIAL PASS TEST

Diagnostic: identify your starting point

Try without notes. Use a calculator only for question 10. Record your approach even if you cannot finish. Use the result to choose your first revision topics.

1 [1 marks] Order -9,2,-1,0.

2 [1 marks] Calculate 56 × 24.

3 [1 marks] Calculate 7.5-2.875.

4 [2 marks] Calculate 2/3+3/4.

5 [1 marks] Find 18% of £350.

6 [2 marks] £96 is a price after 20% reduction. Find original.

7 [2 marks] Share £420 in ratio 2:5.

8 [1 marks] Evaluate $9+2 \times 4^2$.

9 [1 marks] Convert 1 h 51 min to decimal hours.

10 [2 marks] Find circle area for radius 3 cm to 2 dp.

11 [2 marks] Find mean and median of 0,3,5,8.

12 [2 marks] A fair die is rolled. Find P(score at least 5) as fraction and percentage.

MARK, THEN CHOOSE A TARGET

Diagnostic answers and action

1. -9,-1,0,2.

2. 1,344.

3. 4.625.

4. 8/12+9/12 = 17/12 = 1 5/12 (1 for common denominator,1 for result).

5. £63.

6. 96/0.8 = £120 (1 method,1 result).

7. One part £60, shares £120 and £300 (1 method,1 shares).

8. 41.

9. 1.85 hours.

10. $9\pi \approx 28.27$ cm² (1 method,1 result/unit).

11. Mean 4 (1)
median 4 (1)

12. 2/6 = 1/3 (1)
33 1/3% (1)

Turn the result into a plan

Question	Revisit topic
1	1: signed numbers
2-3	2 and 10: calculation
4,7	7 and 11: fractions and ratio
5-6	5-6: percentage amounts and reverse percentages
8	12: operation order
9-10	15-16: time, measures and circles
11-12	23,25,27: averages and probability

MY NEXT STEP

Topic to study first: ____
Method or fact I need: _____
Practice date: ____ Retry date: ____

Do not treat 18 marks as an exam readiness threshold. A diagnostic samples a few methods and does not assess the full Level 2 problem-solving demand.

TOPIC PRACTICE • PART A • 6 MARKS

01. Numbers, place value and negatives

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Write 8.062 million in figures. State the value of the digit 6.

2 [2 marks] Order -15, -3, 4, -8 and 0 from smallest to largest. Explain which negative value is greatest.

3 [2 marks] Order 3.07, 3.007 and 3.7. Explain why a trailing zero can be added without changing a value.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 01 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A store records -12°C. It warms by 9°C, then cools by 5°C. Find both new readings and the total signed change from the original reading.

5 [4 marks] An account starts at -£146. A £225 payment arrives; £38 and £67 are then spent. Find the final balance and the minimum further payment needed to reach £50.

6 [6 marks] A laboratory may use a room when its temperature is between -3°C and 4°C inclusive. It begins at -7°C and warms by 2°C each hour for six hours. Record all six readings, identify the permitted hours and explain why a reading exactly at a boundary is allowed.

Topic total: ____ /20. Solutions on page 85. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

02. Whole-number calculation and checking

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Calculate 57,896 + 26,708. Check using subtraction.

2 [2 marks] Calculate 73 × 48 without a calculator. Show a decomposition or column method.

3 [2 marks] Calculate 15,624 ÷ 24. Check by multiplication.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 02 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] An organiser orders 37 sets of 28 leaflets. Find the total. Sets cost £4.80 each; calculate the order cost.

5 [4 marks] A theatre has 318 guests. Coaches have 46 seats and cost £175 each. Find the minimum hire cost and empty seats.

6 [6 marks] A supplier must pack 742 items in crates of 32. Each crate costs £8.75 to prepare; transport is £36 for the whole order. Find the minimum full-crate count, total cost and spare capacity. Check that one fewer crate would fail.

Topic total: ____ /20. Solutions on page 86. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

03. Expressions and formulae

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] Evaluate E = 6 p - 9 when p = 8. Show substitution.

2 [2 marks] Use T = (a + b)/4 when a = 17 and b = 11. Explain the role of the brackets.

3 [2 marks] Use R = 2 x^2 + 5 when x = -3. Show how the negative value is squared.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 03 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A machine charge is C = 14 + 3.6 h pounds for h hours. Find the charge for 7.5 hours and the number of hours bought for £50.

5 [4 marks] A supplied formula gives volume V = (bhl)/2. Use b = 8 cm, h = 5 cm and l = 12 cm. Find V and the volume of three identical objects.

6 [6 marks] A catering charge in pounds is C = 35 + 4.8 n + 0.6 d, where n is guests and d is delivery distance in km. For 32 guests and 18 km, find the charge. The budget is £200. At the same delivery distance, find the greatest whole number of guests the budget covers.

Topic total: ____ /20. Solutions on page 87. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

04. Fractions, decimals and percentages

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Write 7/16 as a decimal and percentage.

2 [2 marks] Write 0.84 as a simplest fraction and percentage.

3 [2 marks] Write 2.4% as a decimal and simplest fraction.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 04 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] Order 5/8, 0.63, 61% and 3/5. Show a common comparison form.

5 [4 marks] Four task-completion indicators are 0.875, 7/8, 86% and 0.89. Identify the largest share and the equal shares, explaining conversions.

6 [6 marks] A water tank is 0.72 full. Another description says 18/25 full and a third says 72%. Decide whether they agree. The tank capacity is 1,250 litres. Find the water volume and the percentage of capacity still empty.

Topic total: ____ /20. Solutions on page 88. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

05. Percentages of amounts

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Find 13% of £620 without a calculator.

2 [2 marks] Express 39 as a percentage of 65.

3 [2 marks] Express 625 ml as a percentage of 2.5 litres.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 05 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A course has 240 learners. 37.5% attend online. Find online and in-person numbers, assuming all others attend in person.

5 [4 marks] A factory completes 168 of 224 orders. Find the percentage complete and the number still incomplete.

6 [6 marks] A club invites 360 people and 65% reply. Of the replies, 4/9 request a weekend session. Find the number of replies, weekend requests and weekend requests as a percentage of all invitees. State the base for each percentage.

Topic total: ____ /20. Solutions on page 89. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

06. Percentage change and original amounts

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] Increase £375 by 12%. Show the multiplier.

2 [2 marks] Decrease 640 kg by 17.5%. Show the multiplier.

3 [2 marks] A fee rises from £56 to £70. Calculate the percentage increase.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 06 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A jacket costs £91 after a 30% reduction. Find its original price and the saving.

5 [4 marks] An £850 machine increases by 8%, then decreases by 5%. Find the final price and overall percentage change.

6 [6 marks] A membership costs £138 after a 15% increase. Find the previous fee. A different offer charges that previous fee plus a £9 joining charge. Compare the cost of the two offers for one year. Show a reverse-percentage check and state the cheaper option.

Topic total: ____ /20. Solutions on page 90. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

07. Adding, subtracting and ordering fractions

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Calculate 3/4 + 7/12. Give a simplified mixed number.

2 [2 marks] Calculate 3 1/6 - 1 3/4. Show a common denominator.

3 [2 marks] Order 5/6, 7/9 and 11/12. Show equivalent fractions.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 07 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A roll contains 8 1/4 m. Two cuts use 2 5/6 m and 1 3/8 m. Find the length remaining.

5 [4 marks] An event lasts 3 2/3 hours. A demonstration uses 1 5/12 hours and a break 1/4 hour. Find time left in hours and minutes.

6 [6 marks] A maker has 6 1/2 m of cord. Six equal decorations each need 7/8 m. Find the cord used and left over. A final decoration needs 1 1/3 m. Decide whether it can be made, giving the exact surplus or shortfall.

Topic total: ____ /20. Solutions on page 91. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

08. Fractions of quantities

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Express 42 as a simplest fraction of 70.

2 [2 marks] Express 80 minutes as a simplest fraction of 3 hours.

3 [2 marks] Find 5/9 of £783.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 08 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A store has 84 kg of material, which is 7/12 of a full delivery. Find the full delivery and the missing mass.

5 [4 marks] A class of 45 has 2/5 studying art and 1/3 studying music, with no overlap. Find how many study neither and their fraction of the class.

6 [6 marks] A £1,680 fund allocates 3/8 to equipment and 2/7 of the remaining money to transport. Find each allocation and the final balance. Explain why 2/7 must not be taken from the original total.

Topic total: ____ /20. Solutions on page 92. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

09. Decimals and sensible accuracy

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Order 6.04, 6.004, 6.4 and 6.14.

2 [2 marks] Round 18.675 to 1 decimal place and to 2 decimal places.

3 [2 marks] Round 0.008746 to 2 significant figures. Explain which digit starts the count.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 09 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A calculated load is 29.995 kg. Report it to 2 decimal places and to the nearest kg. Explain the carrying step.

5 [4 marks] A floor requires 23.1 m² of coverage. Each sealed box covers 1.8 m². Find boxes needed and surplus coverage.

6 [6 marks] A wire reading is 1.246 m. The accepted interval is 1.246 m to 1.254 m inclusive. Decide whether it passes using the original reading. Report it to 2 decimal places. Give two possible readings that both report as 1.25 m, one passing and one failing, and explain the limitation of the rounded report.

Topic total: ____ /20. Solutions on page 93. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

10. Calculating with decimals

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Calculate 9.086 + 3.75. Show aligned place values.

2 [2 marks] Calculate 15 - 6.728. Check the result using addition.

3 [2 marks] Calculate 3.25 × 0.24 and explain whether the result should be smaller than 3.25.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 10 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] Divide 8.64 by 0.16. Show an equivalent whole-number division and check the answer.

5 [4 marks] A robot uses 0.185 litres of oil per run. It completes 28 runs from a 6-litre supply. Find oil used and remaining.

6 [6 marks] A printer uses 0.032 kg of material for each object plus 0.18 kg once for setup. Starting with 5 kg, find whether 145 objects can be printed. Determine the greatest complete number of objects possible and the unused material at that maximum.

Topic total: ____ /20. Solutions on page 94. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

11. Ratio and proportion

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Simplify 600 ml : 1.5 litres.

2 [2 marks] Share £945 in the ratio 2:3:4.

3 [2 marks] A recipe for 12 portions uses 840 g of oats. Find the oats for 17 portions.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 11 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A mixture has paint: water = 5:2. There are 18 litres of paint. Find water needed and total mixture.

5 [4 marks] Nine equally productive machines finish a batch in 16 hours. Estimate the time for 12 machines; state the model assumption.

6 [6 marks] A festival mixture has juice: water = 3:5. A stall needs 64 litres and has 20 litres of juice and 50 litres of water. Find required quantities, the shortage or surplus of each and the greatest volume possible without buying more ingredients.

Topic total: ____ /20. Solutions on page 95. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

12. Order of operations and powers

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Evaluate $12 + 4 \times 3^2$.

2 [2 marks] Evaluate $48 \div 8 \times 3$. Explain the order.

3 [2 marks] Evaluate $25 - (7 - 2)^2 + 6$.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 12 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A sequence follows T = 6 n - 1. Find the first three terms and the 15 th term.

5 [4 marks] A joined-tile pattern needs 4 n + 3 tiles at stage n. Find stage 18 and the greatest complete stage possible with 100 tiles.

6 [6 marks] A machine follows $E = 50 - 3(n + 2)^2/2$. Evaluate E for n = 2. A learner calculates 376 by starting with 50 - 3, then multiplying. Explain the error and give a sensible written sequence of intermediate results.

Topic total: ____ /20. Solutions on page 96. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

13. Money, tax, budgets and compound interest

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] Find £1,200 after 2 years at an invented 3% annual compound rate, with no transactions.

2 [2 marks] A £265 bill has a stated 20% tax added. Calculate the final bill and the tax amount.

3 [2 marks] A budget has income £1,780 and costs £725, £210, £340, £185. Find total costs and balance.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 13 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A supplier charges £560 before an 18% discount, then adds a stated 20% tax to the discounted price. Find the final price.

5 [4 marks] A worker receives £285 weekly and budgets £1,100 per average month. Use 52 weeks per year to find average monthly income and surplus.

6 [6 marks] A group saves £3,000 for 3 years at 2% annual compound interest. A trip costs £2,640 before a 12% discount plus a fixed £90 fee. Find the final savings, trip cost and remaining balance. State all rates are exercise data, and check the trip bill is affordable.

Topic total: ____ /20. Solutions on page 97. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

14. Units, conversion factors and graphs

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] Convert 4.08 km to metres and 1,750 ml to litres.

2 [2 marks] Use 1 inch = 2.54 cm to convert 22 inches to cm.

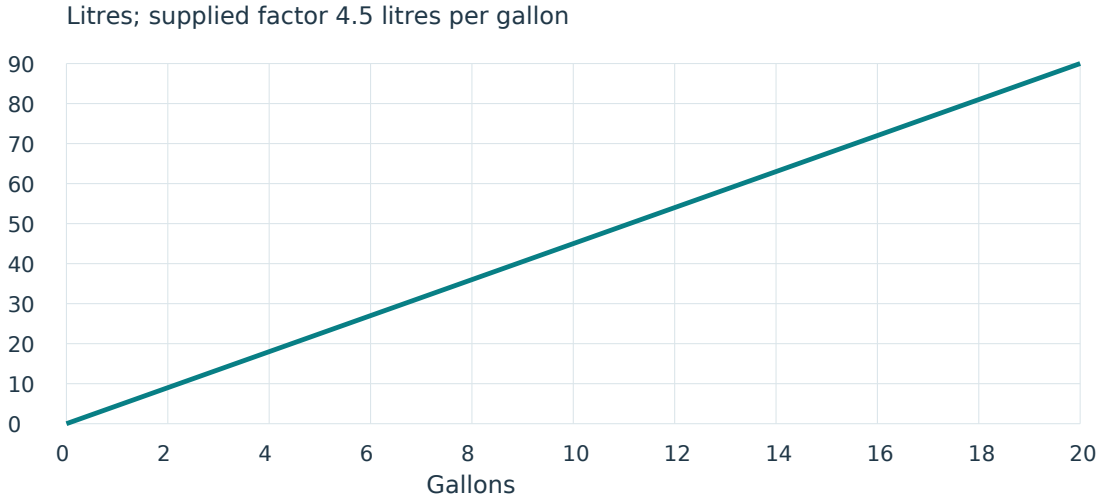
3 [2 marks] Use 1 kg ≈ 2.2 lb to convert 92.4 lb to kg.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 14 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.



4 [4 marks] A delivery is 17.5 gallons. Use the printed conversion graph, which uses 1 gallon ≈ 4.5 litres, to estimate litres. Check with the factor.

5 [4 marks] A container has volume 0.027 m³. Convert to cm³ and litres, explaining the cubic conversion.

6 [6 marks] A business needs 150 litres of liquid. It can buy sealed 4-gallon cans. Use 1 gallon ≈ 4.5 litres. Each can costs £21.60. Find the minimum cans, cost and surplus capacity. Explain why using 150/4 would be incorrect.

Topic total: ____ /20. Solutions on page 98. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

15. Speed, density, pay and time

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] Convert 3 h 42 min to decimal hours and 1.65 hours to hours and minutes.

2 [2 marks] Find average speed for 187 km in 2 h 45 min.

3 [2 marks] Find density for a 936 g object of volume 360 cm^3.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 15 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A shift is 07:45-16:15 with a 45-minute unpaid break. Pay is an invented £14.80 per hour. Find paid hours and wages.

5 [4 marks] A vehicle travels 72 km in 1.2 hours and then 45 km in 0.75 hours. Find total average speed, showing why total distance and total time are used.

6 [6 marks] A worker drives 132 km at average speed 66 km/h, stops for 25 minutes, then drives 84 km at 56 km/h. Starting at 09:10, find finishing time and pay at £15 per hour for all elapsed time. Present pay to the nearest penny.

Topic total: ____ /20. Solutions on page 99. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

16. Perimeter, area and composite shapes

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] Find area and perimeter of an 8.4 m by 3.5 m rectangle.

2 [2 marks] Find the area of a triangle with base 15 cm and perpendicular height 8 cm.

3 [2 marks] Find circumference and area of a circle of radius 7 cm, to 1 decimal place.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 16 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] An L-shaped floor is a 9 m by 7 m rectangle with a 4 m by 3 m top-right corner removed. Sketch it and find area and perimeter.

5 [4 marks] A semicircular sign has diameter 1.8 m. Find its area and total boundary length, to 2 decimal places.

6 [6 marks] A display combines a 4 m by 2.5 m rectangle and a triangle of base 4 m and perpendicular height 1.2 m without overlap. Add 7.5% to total area for waste. Material comes in packs covering 1.8 m² at £19.50. Find packs needed and minimum cost.

Topic total: ____ /20. Solutions on page 100. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

17. Volume and surface area

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] Find volume and closed surface area of a 10 cm by 6 cm by 4 cm cuboid.

2 [2 marks] Find volume of a cylinder with radius 5 cm and height 9 cm, to nearest cm^3.

3 [2 marks] Find closed surface area of a cylinder of radius 3 cm and height 7 cm, to 1 decimal place.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 17 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] An open cylindrical can has radius 4 cm and height 11 cm. Find the material area for its curved side and one base, to 1 decimal place.

5 [4 marks] A tank is 0.8 m by 0.6 m by 0.5 m internally. It is 65% full. Find water in litres and time to drain at 12 litres/min.

6 [6 marks] A closed cylindrical storage vessel has internal diameter 0.7 m and height 1.4 m. Ignore wall thickness. Find capacity in litres to the nearest litre, then usable volume at 90% full. At 18 litres per minute, find complete minutes of supply, retaining precision until the last decision.

Topic total: ____ /20. Solutions on page 101. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

18. Scale drawings and actual dimensions

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] A 1:250 plan shows a line of 4.6 cm. Find actual length in metres.

2 [2 marks] At 1:50, find drawing length for an actual 3.8 m wall.

3 [2 marks] Write “1 cm represents 2.5 m” as a ratio scale.

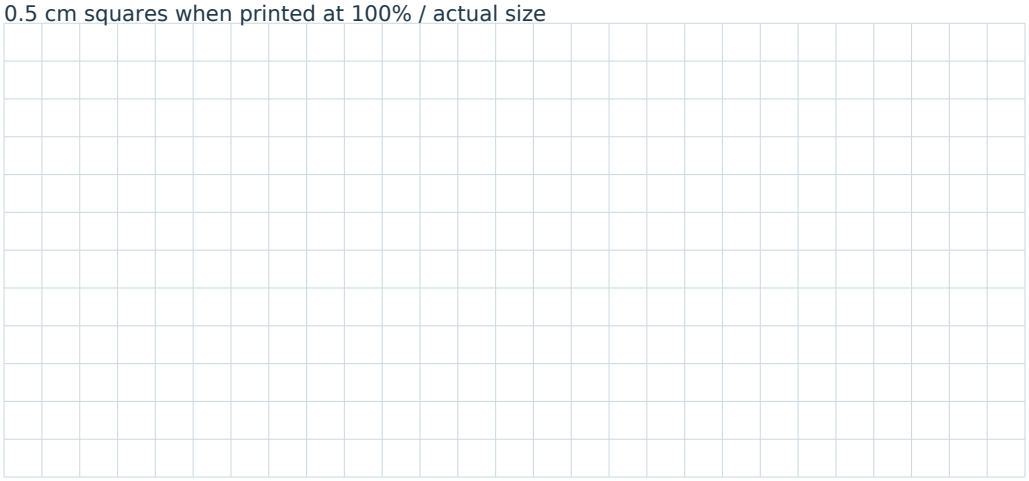
Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 18 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

0.5 cm squares when printed at 100% / actual size



4 [4 marks] A room is 8 m by 5.5 m. Draw its plan at 1:100 on the supplied square grid and add a 1.2 m wide doorway on one side. Label scale and dimensions.

5 [4 marks] A rectangle is 6 cm by 2.5 cm on a 1:200 plan. Find actual perimeter and area.

6 [6 marks] A 1:50 plan must show a 4 m wide wall with a centred 1.5 m wide window. Draw the wall as a horizontal line, mark the window endpoints, and calculate each real side gap and drawing side gap. Use a ruler; label all quantities.

Topic total: ____ /20. Solutions on page 102. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

19. Coordinates in four quadrants

No calculator for these three questions. Show working. Check answers only after completing both pages.



1 [2 marks] Plot P(-4,3) and Q(2,-1) on the coordinate grid.

2 [2 marks] Give coordinates of a point on the x-axis and a different point on the y-axis. Explain the zero coordinate in each.

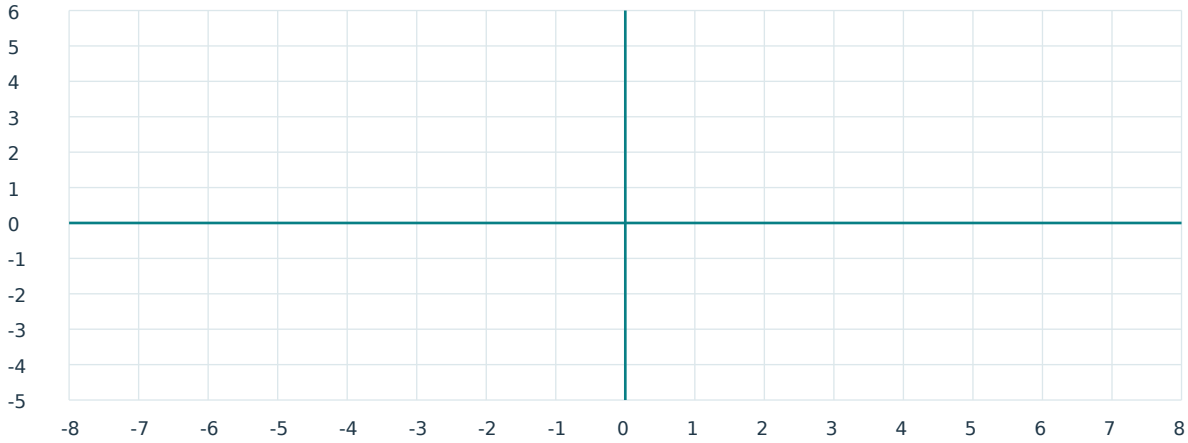
3 [2 marks] Find horizontal distance from (-7,2) to (5,2), and their midpoint.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 19 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.



4 [4 marks] A rectangle has consecutive vertices A(-2,-3), B(4,-3), C(4,2). Find the fourth vertex, area and perimeter.

5 [4 marks] A sensor moves from (-5,4) right 8, down 6, left 2. Find its final point and the midpoint of the start and final points.

6 [6 marks] A garden on a grid has corners (-4,-2),(3,-2),(3,4),(-4,4). Each grid unit is 0.5 m. Find the actual perimeter, actual area and centre coordinates. Explain why the length scale cannot be applied just once to the grid area.

Topic total: ____ /20. Solutions on page 103. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

20. Solids, nets and views

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] State the faces, edges and vertices of a cuboid.

2 [2 marks] List matching face dimensions for a 12 cm by 7 cm by 3 cm carton.

3 [2 marks] Give the curved net rectangle dimensions for a cylinder of diameter 10 cm and height 8 cm.

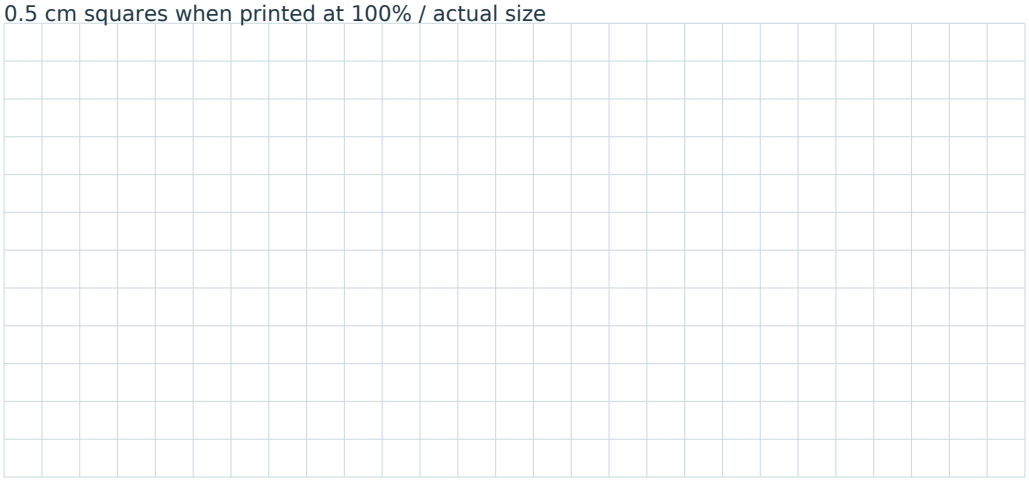
Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 20 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

0.5 cm squares when printed at 100% / actual size



4 [4 marks] Sketch a valid cube net on the supplied square grid. Explain how the faces fold without overlap.

5 [4 marks] An upright cylinder has radius 3.5 cm and height 12 cm. Describe and dimension its plan and front elevation.

6 [6 marks] A closed cuboid carton is 14 cm by 8 cm by 5 cm. Sketch and label a possible net and calculate card area excluding tabs. If each sheet has usable area 800 cm², explain why area alone cannot prove that one sheet can accommodate the net.

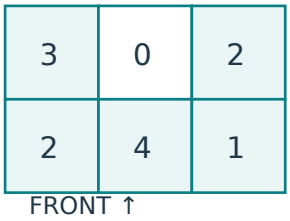
Topic total: ____ /20. Solutions on page 104. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

21. Drawing solids, plans and elevations

No calculator for these three questions. Show working. Check answers only after completing both pages.

Stack heights (front direction shown)



Back row: 3, 0, 2

Front row: 2, 4, 1

1 [2 marks] Sketch a labelled cuboid with dimensions 6 cm by 4 cm by 3 cm. Indicate one hidden edge using a dashed line.

2 [2 marks] Using the height table shown, find total cubes and occupied footprint cells.

3 [2 marks] For the height table, state front elevation column heights and right elevation heights from front to back.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

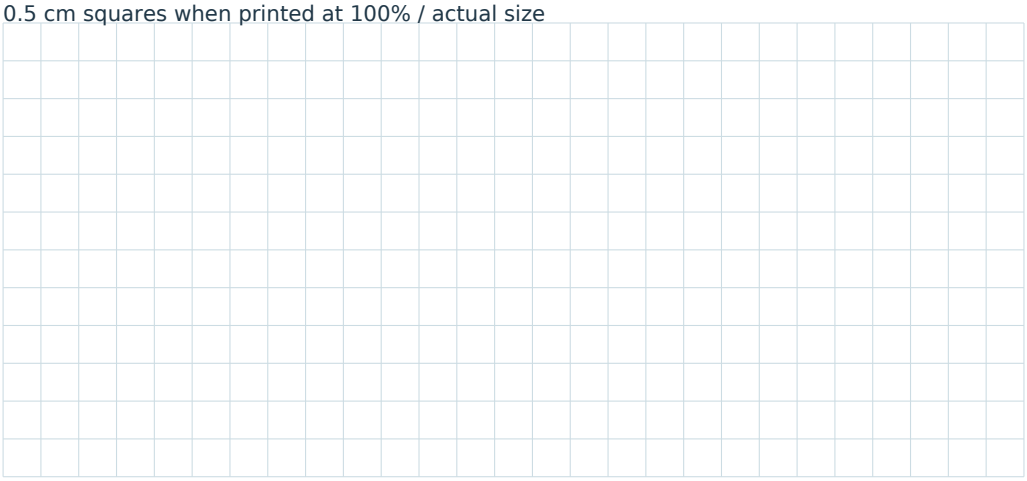
TOPIC 21 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

Use the same model as Part A: front row 2,4,1; back row 3,0,2. Front direction is towards the front row.

0.5 cm squares when printed at 100% / actual size



4 [4 marks] Draw the plan and front elevation on the supplied square grid, with the front direction labelled.

5 [4 marks] Draw the right elevation of the same model and explain why hidden stacks are not added to the height.

6 [6 marks] The back row of the model gains one extra cube on each existing stack; the empty cell stays empty. Recalculate cube count and front and right elevations. Explain whether the plan changes.

Topic total: ____ /20. Solutions on page 105. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

22. Angles and geometric reasoning

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Angles on a straight line are 137° and x. Find x and state the rule.

2 [2 marks] A triangle has two angles 39° and 74°. Find the third and state the rule.

3 [2 marks] An isosceles triangle has apex angle 52°. Find each base angle.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 22 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A point has angles 90°,143°,58° and x. Find x. Then find the exterior angle adjacent to a 64° triangle angle on a straight extension.

5 [4 marks] Two parallel lines are cut by a transversal. One acute angle is 71°. Find a corresponding angle and the adjacent obtuse angle. State both reasons.

6 [6 marks] A quadrilateral has angles 90°,104°, x and 2 x. Find x and 2 x, showing an equation. A learner uses total 180°. Explain the mistake and check your four angles.

Topic total: ____ /20. Solutions on page 106. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

23. Median, mode and organised data

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Find median and mode of 0,6,4,6,9,2,0.

2 [2 marks] Find the median of 11,4,7,13,6,9.

3 [2 marks] Scores 0,1,2,3 have frequencies 2,3,4,1. Find median and mode.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 23 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] Data are 3,3,4,6,9. Add an observation 30. Find the new median and mean, and compare with the original mean.

5 [4 marks] A list is 0,0,2,5,5,7,9,9. Find median and all modes; explain why zeros stay in the list.

6 [6 marks] A manager reports median sales of 8 from 4,6,8,10,12. A sixth recorded day has zero sales. Recalculate median, mean and mode status. Evaluate the claim that the new zero day can be ignored because “nothing was sold”.

Topic total: ____ /20. Solutions on page 107. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

24. Estimated mean from grouped data

Calculator permitted. Show working. Check answers only after completing both pages.

1 [2 marks] For discrete classes 0-4,5-9,10-14, write the midpoints.

2 [2 marks] For midpoints 2,7,12 and frequencies 5,8,7, calculate the three fx values.

3 [2 marks] Using question 2, find the estimated mean and state its unit if the data are books read.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 24 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A class table has items 0-3: f 6,4-7: f 9,8-11: f 5. Estimate mean items to 1 decimal place.

5 [4 marks] A grouped distribution has classes 1-5: f 4,6-10: f 12,11-15: f 4. Estimate its mean and identify the modal class.

6 [6 marks] A stock audit groups damaged items per delivery:0-2: f 8,3-5: f 15,6-8: f 7. Estimate mean damage per delivery. Estimate total damage for 90 similar deliveries using this model. Explain both why the mean is approximate and why the forecast is not guaranteed.

Topic total: ____ /20. Solutions on page 108. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

25. Comparing data and evaluating charts

Calculator permitted. Show working. Check answers only after completing both pages.

The travel data for question 4 are rail 16, bus 10, walk 8, cycle 6. Use the grid on Part B.

1 [2 marks] Find mean and range of 3,6,6,9,11.

2 [2 marks] Compare the means and ranges of A:7,8,9 and B:4,9,11.

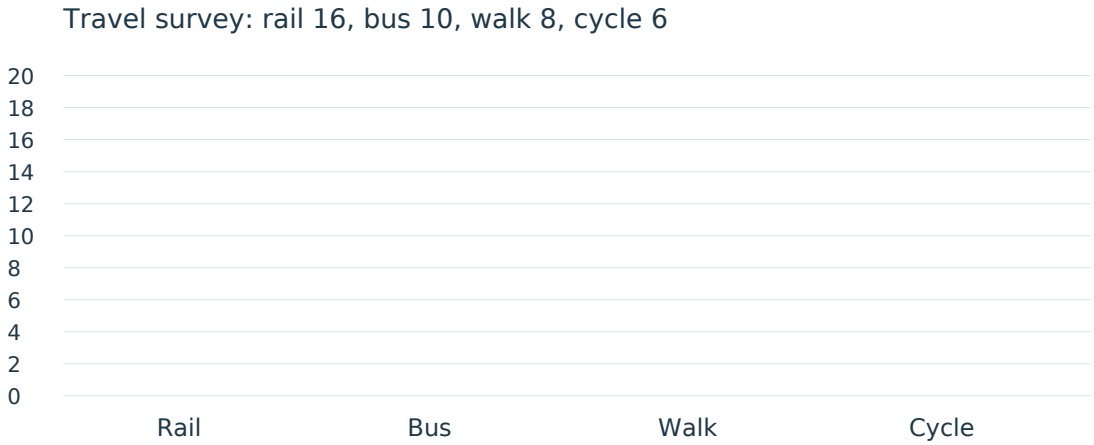
3 [2 marks] For a pie chart of 40 people, calculate sector angles for categories 18,12,10.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 25 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.



4 [4 marks] Use the travel data table to draw a labelled bar chart on the grid. Include a title and suitable frequency scale.

5 [4 marks] Week 1 times are 12,15,15,18,20 min; week 2 are 10,14,15,19,22 min. Compare using mean and range, supporting two comments.

6 [6 marks] A company claims service improved because average waiting time fell from 12 to 10 minutes. Sample sizes are 10 and 100 customers; the ranges are 6 and 25 minutes. Give a numerical percentage decrease in the means and evaluate consistency and the limits of the comparison. Explain one misleading chart choice to avoid.

Topic total: ____ /20. Solutions on page 109. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

26. Combined events and two-way tables

No calculator for these three questions. Show working. Check answers only after completing both pages.

	Morning	Evening	Total
Bus	14	10	24
Non-bus	9	17	26
Total	23	27	50

1 [2 marks] Use the two-way table to find P(evening) and P(bus and morning).

2 [2 marks] From bus users only, find P(morning). Explain the denominator.

3 [2 marks] Use the table to find P(bus or morning), avoiding double counting.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 26 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A fair coin and a fair die are used. List favourable outcomes for head and score at least 5; calculate probability.

5 [4 marks] A bag has 5 red and 4 blue counters. Two are selected without replacement. Find P(both blue) and explain the changed second fraction.

6 [6 marks] For the same bag, find P(one red and one blue) and P(same colour). Check the two probabilities total 1. Show both possible orders for one of each.

Topic total: ____ /20. Solutions on page 110. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

27. Probability forms and expected frequencies

No calculator for these three questions. Show working. Check answers only after completing both pages.

1 [2 marks] Write 9/25 as a decimal and percentage.

2 [2 marks] Write 0.045 as a simplest fraction and percentage.

3 [2 marks] If P(a delay) = 0.18, find P(no delay) as decimal and percentage.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 27 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] An experiment records 84 successes in 120 trials. Find relative frequency as a fraction and percentage. Use it to predict successes in 350 similar trials.

5 [4 marks] A model gives fault probability 3/80. Find expected faults in 640 items and expected non-faulty items.

6 [6 marks] A fair coin gives 36 heads in 50 tosses. Find experimental probability of heads. A learner says tails is now “due” and has probability 36/50 on the next toss. Evaluate this and predict heads in 500 new tosses using the theoretical model. Explain why exactly that number is not guaranteed.

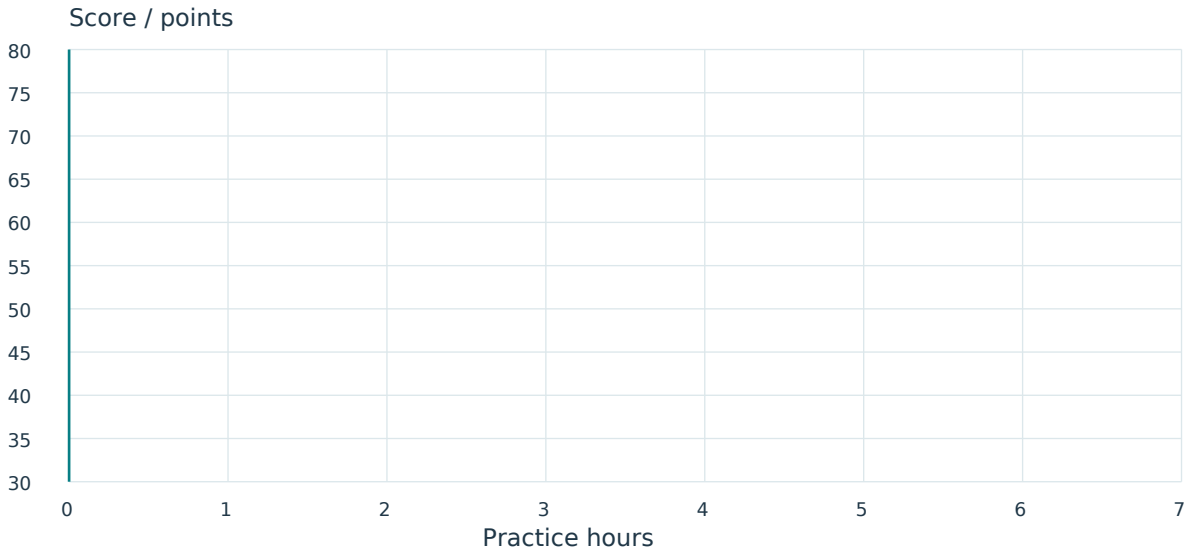
Topic total: ____ /20. Solutions on page 111. Error to revisit: _____

TOPIC PRACTICE • PART A • 6 MARKS

28. Scatter diagrams and correlation

Calculator permitted. Show working. Check answers only after completing both pages.

Data pairs (hours, score): (1,43),(2,49),(3,56),(4,63),(5,67),(6,75).



1 [2 marks] Plot the six paired values from the table on the supplied scatter grid. Label both variables.

2 [2 marks] Describe the direction and apparent strength of the association. Use the context.

3 [2 marks] Draw a line of best fit and estimate the y-value at x = 3.5. Show guide lines.

Part A subtotal: ____ /6. Continue to questions 4-6 on the next page.

TOPIC 28 • PART B • 14 MARKS

Apply, connect and explain

Calculator permitted. Give units and a supported conclusion where requested. Use extra paper for large drawings.

4 [4 marks] A pupil says the graph proves every extra practice hour causes exactly four extra points. Evaluate this claim.

5 [4 marks] Explain interpolation and extrapolation using estimates at x = 4 and x = 12 for this data. State which is more reliable and why.

6 [6 marks] A coach uses the trend to predict a score ofabout 60 for 3.5 hours of practice. A learner actually scores 48. Discuss whether the point would be unusual, whether the prediction was guaranteed, and what further data could improve the model. Support your discussion with the plotted pattern.

Topic total: ____ /20. Solutions on page 112. Error to revisit: _____

MIXED-TOPIC PRACTICE • 10 MARKS

Challenge 1: Fundraising decisions

INFORMATION

A community event sells 96 tickets at £7.50. Ticket income is 60% of all income; stalls provide the rest. Costs are hall £285, equipment £146.80 and refreshments £192.40. The committee wants to donate at least £550.

a [3 marks] Calculate ticket income and total event income.

b [4 marks] Calculate total costs, profit and whether the donation target is met. State the surplus or shortfall.

c [3 marks] A sponsor later gives an extra 10% of the original profit. Find the revised donation available, assuming all profit is donated.

Solutions: page 113. Your score: ____ /10.

MIXED-TOPIC PRACTICE • 10 MARKS

Challenge 2: Travel, time and cost

INFORMATION

A team must reach a venue by 10:15. The route is 27 km. Cycling takes an average 18 km/h plus 15 minutes for parking and changing. A minibus takes 45 minutes including boarding. Minibus hire is £42 plus £0.28 per km for the 54 km return journey; six people split the cost equally.

a [3 marks] Find the latest cycling departure time, allowing exactly the stated time.

b [4 marks] Calculate return minibus cost and each person’s share to the nearest penny.

c [3 marks] The team chooses the minibus but allows an extra 20 minutes contingency before 10:15. Find its departure time and compare with cycling departure.

Solutions: page 113. Your score: ____ /10.

MIXED-TOPIC PRACTICE • 10 MARKS

Challenge 3: A sign with a curved top

INFORMATION

A sign consists of a rectangle 2.4 m wide and 1.5 m high with a semicircle on its top edge. The semicircle diameter equals the rectangle width. There is no overlap in their areas. Two coats of paint are needed. A litre covers 4 m^2 for one coat; paint is sold in 0.75-litre tins costing £11.80.

a [4 marks] Sketch and label the sign, then find its total area to 2 decimal places.

b [3 marks] Find paint required for two coats, retaining precision until choosing tins.

c [3 marks] Find minimum paint cost and state one reason why perimeter would not answer the paint question.

Solutions: page 114. Your score: ____ /10.

MIXED-TOPIC PRACTICE • 10 MARKS

Challenge 4: Production data and planning

INFORMATION

Items packed per worker per shift are grouped as 0-9: f 4,10-19: f 8,20-29: f 6,30-39: f 2. Another site reports an exact mean 17 items and range 25 items. A manager plans output for 40 workers using the first site’s estimated mean.

a [4 marks] Estimate the first site’s mean items per worker.

b [3 marks] Estimate total output for 40 workers and compare the estimated mean with 17.

c [3 marks] Explain why the exact first-site range cannot be recovered from this table and give a limitation of the output prediction.

Solutions: page 114. Your score: ____ /10.

MIXED-TOPIC PRACTICE • 10 MARKS

Challenge 5: Drawing and buying shelving

INFORMATION

A wall is 3.6 m wide and 2.4 m high. A drawing uses 1:30. Three shelves each 1.0 m long are placed horizontally in one row with equal gaps at both wall edges and between shelves. Shelves cost £18.40 each. Fixings cost £7.80 for the complete project.

a [3 marks] Calculate drawing dimensions of the wall and each shelf length.

b [4 marks] Calculate the four equal real gaps and their drawing lengths. Sketch the row with labels.

c [3 marks] Find material cost after a 10% discount on shelves only; fixings are not discounted.

Solutions: page 115. Your score: ____ /10.

MIXED-TOPIC PRACTICE • 10 MARKS

Challenge 6: Survey and a prize draw

INFORMATION

A survey has 80 people: morning cyclists 18, morning non-cyclists 22, evening cyclists 14, evening non-cyclists 26. One person is chosen from cyclists only. In a separate fair draw, a bag contains 6 gold and 4 silver counters; two are drawn without replacement.

a [4 marks] Construct the two-way table and find the probability that the selected cyclist attends the morning.

b [3 marks] Find the chance of one counter of each colour in the draw.

c [3 marks] Find P(same colour), check it against your previous answer, and explain why survey selection and the counter draw must not be combined without a stated connection.

Solutions: page 115. Your score: ____ /10.

SECTION A • START • 15 MARKS TOTAL

Mock paper 1: non-calculator

SUGGESTED TIME: 30 MINUTES

No calculator or notes. Complete A 1-A 5. Show written working. Hand this section over or put it aside before starting Section B. These are workbook practice timings, not universal board rules.

A1 [3 marks] Calculate 7.2-3.865. Show a written method and check using addition.

A2 [3 marks] Calculate 1 3/4+5/6. Give a simplified mixed number and show equivalent fractions.

A3 [3 marks] Use $E = 4x^2-7$ to find E when $x = 3$. Show the substitution and order.

SECTION A • CONTINUED • 15 MARKS TOTAL

Mock paper 1: non-calculator

Continue without a calculator. Complete all questions before moving to Section B. Use the last minutes to check calculations, units and interpretation.

A4 [3 marks] A workshop needs 205 notebooks. Packs contain 18 and cost £7 each. Find minimum packs, cost and spare notebooks.

A5 [3 marks] A session runs 13:35-16:05 with a 20-minute break. Paid instruction is charged at £12 per hour. Find instruction time and fee.

ORDER A FLOOR COVERING • 9 MARKS

Mock paper 1 • B1

SECTION B: calculator permitted. Suggested time 90 minutes for all five tasks,45 marks total. No notes. Use a ruler for constructions.

INFORMATION

A room is 6.4 m by 4.5 m. Add 12.5% of floor area for waste. Packs cover 1.8 m² and cost £22.40 each. Delivery is £19. A competing delivered quote is £430.

a [3 marks] Find floor area and required coverage.

b [3 marks] Find minimum packs and delivered cost.

c [3 marks] Choose the cheaper deal and state the saving. Check the chosen pack count covers the requirement.

Mock paper 1 solutions: pages 116-118. Do not check until both sections are complete.

SAVINGS AND A PURCHASE • 9 MARKS

Mock paper 1 • B2

INFORMATION

A fund has £2,400 and earns an invented 2.5% compound interest annually for 2 years. Equipment is £2,250 before a 16% discount, followed by a stated 20% tax on the discounted price. No other charges apply.

a [3 marks] Find the fund after 2 years, nearest penny.

b [3 marks] Find the equipment bill including discount and tax.

c [3 marks] Decide if funds cover the bill and state the balance or shortfall. Explain why simple interest gives a different balance.

Mock paper 1 solutions: pages 116-118. Do not check until both sections are complete.

AVERAGE SPEED AND PAID TIME • 9 MARKS

Mock paper 1 • B3

INFORMATION

A courier travels 156 km at 65 km/h, stops 24 minutes, then travels 72 km at 48 km/h. Starts 08:45. Pay is £14.40/hour for all elapsed time, including the stop.

a [3 marks] Find time for each driving stage and total elapsed time.

b [3 marks] Find finishing time and total pay.

c [3 marks] Find average speed over the entire journey including the stop. Explain how the stop affects it compared with the moving-only average.

Mock paper 1 solutions: pages 116-118. Do not check until both sections are complete.

DATA AND SERVICE COMPARISON • 9 MARKS

Mock paper 1 • B4

INFORMATION

For part(a), use the list 2,4,4,7,8. For the service comparison, Site A times are 9,10,11,12,13 minutes; Site B times are 6,9,11,13,16. Lower time is faster.

a [3 marks] Calculate mean, median and range of 2,4,4,7,8.

b [4 marks] Calculate mean and range for both sites.

c [2 marks] Compare typical time and consistency using figures.

Mock paper 1 solutions: pages 116-118. Do not check until both sections are complete.

PROBABILITY AND A CYLINDER • 9 MARKS

Mock paper 1 • B5

INFORMATION

Part(a): write 0.075 as a percentage and simplest fraction, and state its complement as a decimal. Separately, a cylindrical container has internal radius 0.25 m and height 0.8 m. It is 70% full. Use π at calculator precision.

a [3 marks] Give the three probability forms requested.

b [4 marks] Find the cylinder capacity in litres and water volume, nearest litre.

c [2 marks] At 8 litres/min, find complete minutes supplied, using unrounded water volume.

Mock paper 1 solutions: pages 116-118. Do not check until both sections are complete.

SECTION A • START • 15 MARKS TOTAL

Mock paper 2: non-calculator

SUGGESTED TIME: 30 MINUTES

No calculator or notes. Complete A 1-A 5. Show written working. Hand this section over or put it aside before starting Section B. These are workbook practice timings, not universal board rules.

A1 [3 marks] Calculate 68 × 47 without a calculator. Show a decomposition and give an estimate to check size.

A2 [3 marks] Find 22.5% of £320 without a calculator. Show how you build the percentage.

A3 [3 marks] Order-0.7,-0.07,0.007,-1.2. Explain the greatest negative value and compare 0.007 with 0.

SECTION A • CONTINUED • 15 MARKS TOTAL

Mock paper 2: non-calculator

Continue without a calculator. Complete all questions before moving to Section B. Use the last minutes to check calculations, units and interpretation.

A4 [3 marks] A recipe for 8 portions uses 560 g oats. A cook needs 15 portions and has 1 kg oats. Find requirement and decide if enough.

A5 [3 marks] A taxi charges £5 plus £1.80 per km. A passenger has £32. Find cost of 14 km and the maximum whole km affordable.

A CIRCULAR DISPLAY AND BUDGET • 9 MARKS

Mock paper 2 • B1

SECTION B: calculator permitted. Suggested time 90 minutes for all five tasks,45 marks total. No notes. Use a ruler for constructions.

INFORMATION

A display is a full circle of diameter 3.6 m. Decoration costs £8.50 per m². Add 8% to decorated area for waste before finding cost. A separate edging strip follows the entire circumference and costs £2.20 per metre, with no waste allowance. Budget £120.

a [3 marks] Find circular area and waste-adjusted area.

b [4 marks] Find decoration cost and edging cost, nearest penny.

c [2 marks] Decide whether £120 is enough and state the surplus or shortfall.

Mock paper 2 solutions: pages 119-121. Do not check until both sections are complete.

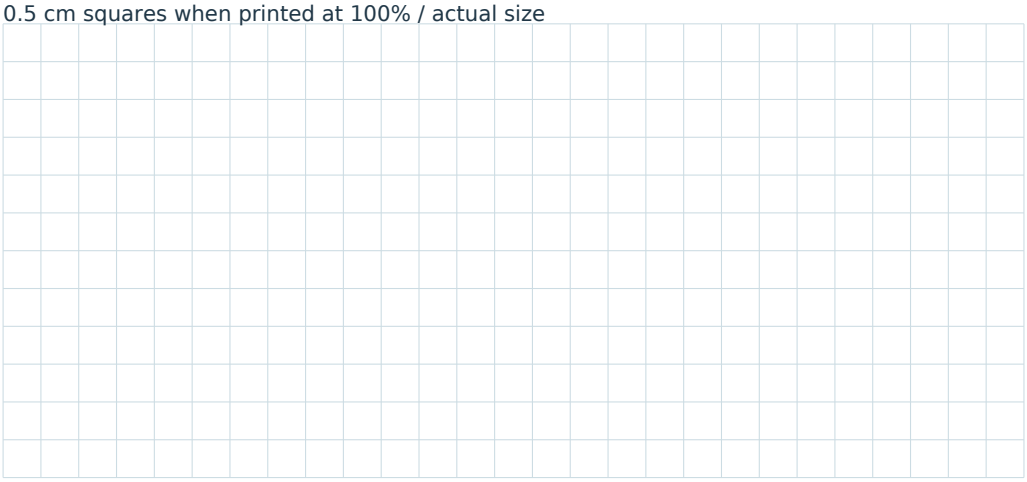
SCALE AND PLACEMENT • 9 MARKS

Mock paper 2 • B2

INFORMATION

An exhibition wall is 4.8 m wide and 2.7 m high. A plan uses 1:60. A 1.8 m wide poster is centred horizontally. A drawing grid is supplied; each small square is 0.5 cm when printed at actual size.

0.5 cm squares when printed at 100% / actual size



a [3 marks] Find drawing dimensions of the wall and poster width.

b [3 marks] Find each real side gap and each drawing side gap.

c [3 marks] Draw the wall rectangle and mark poster-width endpoints, with scale and dimensions.

Mock paper 2 solutions: pages 119-121. Do not check until both sections are complete.

A GROUPED-DATA STAFFING MODEL • 9 MARKS

Mock paper 2 • B3

INFORMATION

Tasks completed per shift:0-4 has frequency 3;5-9 frequency 9;10-14 frequency 8. The manager uses the estimated mean to plan for 30 shifts. The target is 250 tasks. Future work may vary.

a [4 marks] Estimate mean tasks completed per shift.

b [3 marks] Estimate total for 30 shifts and compare with the target.

c [2 marks] Give two reasons the estimate is not a guarantee.

Mock paper 2 solutions: pages 119-121. Do not check until both sections are complete.

ANGLES AND TRANSPORT COSTS • 9 MARKS

Mock paper 2 • B4

INFORMATION

Part(a): a triangle has angles 46°,67°, x. A straight-line angle beside x is y. Separately, a venue return trip is 74 miles. Use 1 mile≈1.6 km. A hired vehicle costs £38 plus £0.45 per km for the return distance already stated. Five people share equally.

a [3 marks] Find x and y and state the angle rules.

b [4 marks] Find return kilometres and total hire charge.

c [2 marks] Find each share, nearest penny, and explain why the distance must not be doubled again.

Mock paper 2 solutions: pages 119-121. Do not check until both sections are complete.

DECIMALS AND A TWO-WAY TABLE • 9 MARKS

Mock paper 2 • B5

INFORMATION

Part(a): calculate 3.6 × 0.25 and 7.2/0.12; write 0.4 as a simplest fraction. Separately, a survey has 60 learners: online morning 12, online evening 18, in-person morning 20, in-person evening 10.

a [3 marks] Give the three numerical answers in part(a).

b [4 marks] Construct a two-way table with totals and find P(online and morning).

c [2 marks] Find P(evening given online) as a percentage, and explain the denominator.

Mock paper 2 solutions: pages 119-121. Do not check until both sections are complete.

TOPIC ANSWERS • 20 MARKS

01. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

8,062,000 (1)
digit 6 is worth 60,000 (1)

Question 2 • 2 marks

-15,-8,-3,0,4 (1)
-3 is the greatest negative value because it lies nearest zero on the negative side (1)

Question 3 • 2 marks

3.007,3.070,3.700 (1)
A trailing zero adds zero at the new place value (1)

Question 4 • 4 marks

-12 + 9 = -3°C (1)
-3 - 5 = -8°C (1)
Total change -8 - (-12) = +4°C (1)
clearly state a rise of 4°C (1)

Question 5 • 4 marks

-146 + 225 = £79 (1)
38 + 67 = £105 (1)
final -£26 (1)
need £76 to reach +£50 (1)

Question 6 • 6 marks

Hour readings -5,-3,-1,1,3,5°C (2: 1 for first three, 1 for last three). Hours 2,3,4,5 permitted (2: 1 for lower boundary and start, 1 for correct end). Hour 1 is too cold and hour 6 too warm (1)
Inclusive means the endpoints themselves satisfy the condition (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

02. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

84,604 (1)
84,604 - 26,708 = 57,896 or equivalent inverse check (1)

Question 2 • 2 marks

73 × (50 - 2) = 3,650 - 146 (1)
= 3,504 (1)

Question 3 • 2 marks

651 (1)
651 × 24 = 15,624 (1)

Question 4 • 4 marks

37 × 28 = 1,036 leaflets (2: method and result). 37 × £4.80 = £177.60 (2: method and result).

Question 5 • 4 marks

318 ÷ 46 = 6 remainder 42, so 7 coaches (2: division and upward decision). Cost £1,225 (1)
empty seats 322 - 318 = 4 (1)

Question 6 • 6 marks

742 ÷ 32 = 23 remainder 6 (1)
need 24 crates (1)
Preparation 24 × 8.75 = £210 (1)
total £246 (1)
Spare capacity 768 - 742 = 26 (1)
Check 23 × 32 = 736, six too few (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

03. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

6 × 8 - 9 (1)
= 39 (1)

Question 2 • 2 marks

(17 + 11)/4 = 7 (1)
Brackets ensure the sum is divided by four (1)

Question 3 • 2 marks

2 × $(-3)^2$ + 5; $(-3)^2$ = 9 (1)
result 23 (1)

Question 4 • 4 marks

14 + 3.6 × 7.5 = £41 (2)
Reverse: (50 - 14)/3.6 = 10 hours (2)

Question 5 • 4 marks

V = 8 × 5 × 12 / 2 (1)
= 240 cm^3 (1)
Three volumes 3 × 240 (1)
= 720 cm^3 (1)

Question 6 • 6 marks

35 + 4.8 × 32 + 0.6 × 18 (1)
= £199.40 (1)
Delivery plus fixed fee = £45.80 (1)
Remaining £154.20 (1)
154.20/4.8 = 32.125 (1)
so at most 32 guests; 33 would cost £204.20 (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

04. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

7/16 = 0.4375 (1)
= 43.75% (1)

Question 2 • 2 marks

84/100 = 21/25 (1)
84% (1)

Question 3 • 2 marks

0.024 (1)
24/1000 = 3/125 (1)

Question 4 • 4 marks

Common percentages: 62.5,63,61,60 (2)
Ascending 3/5,61%,5/8,0.63 (2; one for first two and one for last two).

Question 5 • 4 marks

0.875 = 87.5% and 7/8 = 87.5% (2)
0.89 = 89%, the largest (1)
The first two shares are equal (1)

Question 6 • 6 marks

0.72 = 72/100 = 18/25 (2)
all three descriptions agree (1)
Water 0.72 × 1250 = 900 litres (2: method/result). Empty proportion 1 - 0.72 = 0.28 = 28% (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

05. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

10% £62 and 3% £18.60 (1 for a valid method); total £80.60 (1)

Question 2 • 2 marks

39/65 × 100 (1)
= 60% (1)

Question 3 • 2 marks

Convert to 2,500 ml (1)
625/2500 × 100 = 25% (1)

Question 4 • 4 marks

0.375 × 240 = 90 online (2)
240 - 90 = 150 in person (2)

Question 5 • 4 marks

168/224 × 100 = 75% (2)
224 - 168 = 56 incomplete (2)

Question 6 • 6 marks

0.65 × 360 = 234 replies (2)
234/9 × 4 = 104 weekend requests (2)
104/360 × 100 ≈ 28.9% (1)
Bases are all 360 for reply rate and final percentage; 234 replies for the fractional preference (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

06. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

375 × 1.12 (1)
= £420 (1)

Question 2 • 2 marks

640 × 0.825 (1)
= 528 kg (1)

Question 3 • 2 marks

(70 - 56)/56 × 100 (1)
= 25% (1)

Question 4 • 4 marks

91/0.70 = £130 (2)
Saving £130 - £91 = £39 (2)

Question 5 • 4 marks

850 × 1.08 × 0.95 = £872.10 (2)
Increase £22.10; 22.10/850 × 100 = 2.6% increase (2)

Question 6 • 6 marks

Previous = 138/1.15 = £120 (2)
Alternative £120 + £9 = £129 (1)
Alternative cheaper by £9 (2: conclusion and difference). Check £120 × 1.15 = £138 (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

07. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

9/12 + 7/12 = 16/12 (1)
= 1 1/3 (1)

Question 2 • 2 marks

38/12 - 21/12 = 17/12 (1)
= 1 5/12 (1)

Question 3 • 2 marks

Use /36: 30/36,28/36,33/36 (1)
order 7/9,5/6,11/12 (1)

Question 4 • 4 marks

198/24 - 68/24 - 33/24 (2)
= 97/24 = 4 1/24 m (2)

Question 5 • 4 marks

44/12 - 17/12 - 3/12 = 24/12 = 2 hours (3 for conversion and subtraction). This is 2 h 0 min (1)

Question 6 • 6 marks

Used 6 × 7/8 = 42/8 = 5 1/4 m (2)
Left 6 1/2 - 5 1/4 = 1 1/4 m (2)
Need 1 1/3; short by 1/12 m, so cannot make it (2)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

08. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

42/70 = 3/5 (2: fraction and simplification).

Question 2 • 2 marks

3 h = 180 min (1)
80/180 = 4/9 (1)

Question 3 • 2 marks

783/9 × 5 (1)
= £435 (1)

Question 4 • 4 marks

One twelfth 84/7 = 12 kg (1)
full 144 kg (1)
Missing 144 - 84 = 60 kg (2)

Question 5 • 4 marks

Art 18, music 15 (2)
Neither 45 - 33 = 12 (1)
fraction 12/45 = 4/15 (1)

Question 6 • 6 marks

Equipment 1680 × 3/8 = £630 (2)
remainder £1,050 (1)
Transport 1050 × 2/7 = £300 (1)
Final £750 (1)
The stated whole for transport is the remainder, not the initial fund (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

09. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

6.004,6.040,6.140,6.400 (2: fully correct; 1 if only one pair misplaced).

Question 2 • 2 marks

18.7 (1)
18.68 (1)

Question 3 • 2 marks

0.0087 (1)
Start at the first non-zero digit, 8 (1)

Question 4 • 4 marks

30.00 kg (2: correct carry and two dp); 30 kg (1)
Rounding the hundredths upward carries through both nines (1)

Question 5 • 4 marks

23.1/1.8 = 12.833... (1)
13 boxes (1)
coverage 23.4 m^2 (1)
surplus 0.3 m^2 (1)

Question 6 • 6 marks

1.246 m is exactly the lower inclusive limit, so passes (2)
It reports as 1.25 m (1)
Example: 1.250 m passes and 1.245 m fails; both round to 1.25 m (2)
A rounded report conceals information needed to compare with the exact limits (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

10. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

9.086 + 3.750 (1)
= 12.836 (1)

Question 2 • 2 marks

8.272 (1)
8.272 + 6.728 = 15 (1)

Question 3 • 2 marks

0.78 (1)
multiplying by positive 0.24, less than one, makes a positive value smaller (1)

Question 4 • 4 marks

864/16 (1)
= 54 (1)
Check 54 × 0.16 = 8.64 (2)

Question 5 • 4 marks

28 × 0.185 = 5.18 litres (2)
remaining 0.82 litres (2)

Question 6 • 6 marks

145 × 0.032 + 0.18 = 4.82 kg (2)
so enough (1)
Available after setup 4.82 kg; 4.82/0.032 = 150.625 (1)
so maximum 150 (1)
Unused 5 - (150 × 0.032 + 0.18) = 0.02 kg (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

11. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

600:1500 = 2:5 (2: common units and simplification).

Question 2 • 2 marks

9 parts; £105 per part (1)
shares £210, £315, £420 (1)

Question 3 • 2 marks

840/12 × 17 = 1,190 g (2)

Question 4 • 4 marks

One part 18/5 = 3.6 litres (1)
water 7.2 litres (1)
total 25.2 litres (2)

Question 5 • 4 marks

9 × 16 = 144 machine-hours (1)
144/12 = 12 hours (2)
Same productivity, fixed batch, no interference or delays (1)

Question 6 • 6 marks

8 parts; each 8 litres (1)
Need juice 24 litres and water 40 litres (2)
Juice shortage 4 litres, water surplus 10 litres (1)
Juice limits the batch: 20/3 × 8 = 53 1/3 litres (2; water needed 33 1/3 litres is available).

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

12. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

$3^2 = 9$ (1)
$12 + 36 = 48$ (1)

Question 2 • 2 marks

$48/8 = 6$, then $\times 3 = 18$ (1)
Multiplication and division have equal priority, left to right (1)

Question 3 • 2 marks

$25 - 25 + 6$ (1)
$= 6$ (1)

Question 4 • 4 marks

$n = 1,2,3$ gives 5,11,17 (2)
15 th is $6 \times 15 - 1 = 89$ (2)

Question 5 • 4 marks

$4 \times 18 + 3 = 75$ (2)
$(100 - 3)/4 = 24.25$, so maximum stage 24 (2)

Question 6 • 6 marks

$n+2 = 4$, square 16 (2)
$3 \times 16 / 2 = 24$ (1)
$E = 26$ (1)
Subtraction occurs after powers, multiplication and division (1)
Clear intermediate expression, e.g. $50 - 3 \times 16/2$, demonstrates the correct structure (1)
The stated incorrect result is not required to be reproduced.

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

13. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

1200×1.03^2 (1)
= £1,273.08 (1)

Question 2 • 2 marks

Final £318 (1)
tax £53 (1)

Question 3 • 2 marks

Costs £1,460 (1)
surplus £320 (1)

Question 4 • 4 marks

560×0.82 = £459.20 (2)
× 1.20 = £551.04 (2)

Question 5 • 4 marks

$285 \times 52 / 12$ = £1,235 (2)
Surplus £135 (2)

Question 6 • 6 marks

3000×1.02^3 = £3,183.624 → £3,183.62 (2)
Bill $2640 \times 0.88 + 90$ = £2,413.20 (2)
Affordable; balance £770.42 using monetary rounding (2)
All rates are invented exercise inputs, not current advice; no mark withheld for omitting that editorial statement.

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

14. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

4,080 m (1)
1.75 litres (1)

Question 2 • 2 marks

22 × 2.54 = 55.88 cm (2)

Question 3 • 2 marks

92.4/2.2 = 42 kg (2)

Question 4 • 4 marks

About 78.75 litres; accept an appropriate graph reading about 78-80 litres (2)
Factor check 17.5 × 4.5 = 78.75 (2)

Question 5 • 4 marks

1 m^3 = 1,000,000 cm^3 (1)
27,000 cm^3 (1)
Divide by 1,000 to obtain 27 litres (2)

Question 6 • 6 marks

Can capacity 4 × 4.5 = 18 litres (1)
150/18 = 8.333..., buy 9 (2)
Cost £194.40 (1)
capacity 162 litres, surplus 12 (1)
150 litres cannot be divided directly by 4 gallons without converting units (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

15. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

3.7 hours (1)
1 h 39 min (1)

Question 2 • 2 marks

Time 2.75 h (1)
speed 187/2.75 = 68 km/h (1)

Question 3 • 2 marks

936/360 = 2.6 g/cm³ (2: method/unit and value).

Question 4 • 4 marks

Elapsed 8.5 h; paid 7.75 h (2)
Wages 7.75 × 14.80 = £114.70 (2)

Question 5 • 4 marks

Distance 117 km (1)
time 1.95 h (1)
Average = 117/1.95 = 60 km/h (1)
use elapsed moving times and combined distance rather than an unweighted average (1)

Question 6 • 6 marks

First drive 2 h; second 1.5 h (2)
Total 3 h 55 min (1)
finish 13:05 (1)
Paid time 235/60 h (1)
pay £58.75 (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

16. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Area 29.4 m² (1)
perimeter 23.8 m (1)

Question 2 • 2 marks

15 × 8 / 2 = 60 cm² (2)

Question 3 • 2 marks

Circumference 14π = 44.0 cm (1)
area 49π = 153.9 cm² (1)

Question 4 • 4 marks

Area 63 - 12 = 51 m² (2)
Boundary remains 2(9+7) = 32 m (2; trace all six exposed edges).

Question 5 • 4 marks

r = 0.9 m. Area 0.5π × 0.9² ≈ 1.27 m² (2)
Boundary 0.9π + 1.8 ≈ 4.63 m (2)

Question 6 • 6 marks

Rectangle 10 m²; triangle 2.4 m² (2)
Total 12.4 × 1.075 = 13.33 m² (2)
13.33/1.8 = 7.405..., buy 8 packs (1)
cost £156 (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

17. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Volume 240 cm³ (1)
area 2(60+40+24) = 248 cm² (1)

Question 2 • 2 marks

225π ≈ 707 cm³ (2: substitution and result).

Question 3 • 2 marks

2π × 3 × 7 + 2π × 9 = 60π ≈ 188.5 cm² (2)

Question 4 • 4 marks

2π × 4 × 11 + π × 16 = 104π (2)
≈ 326.7 cm² (2)

Question 5 • 4 marks

Volume 0.24 m³ = 240 litres (2)
65% = 156 litres (1)
drain 13 minutes (1)

Question 6 • 6 marks

r = 0.35 m (1)
V = π × 0.35² × 1.4 ≈ 0.538783... m³ = 539 litres rounded (2)
90% unrounded capacity ≈ 484.905 litres (1)
Divide by 18 ≈26.939 minutes (1)
so 26 complete minutes (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

18. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

4.6 × 250 = 1150 cm = 11.5 m (2)

Question 2 • 2 marks

380/50 = 7.6 cm (2)

Question 3 • 2 marks

1:250 (2: unit conversion and ratio).

Question 4 • 4 marks

8 cm × 5.5 cm rectangle (2)
Door gap 1.2 cm (1)
Scale and dimension labels (1)
Drawing accuracy ±1 mm is the workbook criterion.

Question 5 • 4 marks

Actual 12 m by 5 m (2)
perimeter 34 m (1)
area 60 m² (1)

Question 6 • 6 marks

Wall 8 cm and window 3 cm on drawing (2)
Real spare width 2.5 m, each gap 1.25 m (2)
Drawing gaps 2.5 cm each, centred correctly (1)
Ruler drawing and clear labels (1)
accept ±1 mm on paper.

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

Visual checking guide: page 126.

TOPIC ANSWERS • 20 MARKS

19. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

P four left/three up, Q two right/one down (1 each).

Question 2 • 2 marks

Examples (3,0), (0,4) (1)
x-axis has y = 0 and y-axis has x = 0 (1)

Question 3 • 2 marks

Distance 12 units (1)
midpoint(-1,2) (1)

Question 4 • 4 marks

Fourth(-2,2) (1)
Width 6, height 5 (1)
area 30 square units (1)
perimeter 22 units (1)

Question 5 • 4 marks

Final(1,-2) (2)
Midpoint((-5+1)/2,(4-2)/2) = (-2,1) (2)

Question 6 • 6 marks

Grid width 7, height 6; actual 3.5 m by 3 m (2)
Perimeter 13 m (1)
area 10.5 m^2 (1)
centre(-0.5,1) (1)
Area uses $0.5^2 = 0.25$ m^2 per square unit (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

Visual checking guide: page 126.

TOPIC ANSWERS • 20 MARKS

20. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

6 faces,12 edges,8 vertices (2: all; 1 if two counts correct).

Question 2 • 2 marks

Two 12 × 7, two 12 × 3, two 7 × 3 rectangles (2)

Question 3 • 2 marks

10π cm by 8 cm, approximately 31.42 cm by 8 cm (2)

Question 4 • 4 marks

One valid example: four equal squares in a row, a square above and below the second (2)
Explain four side faces, top and base, no overlap (2)

Question 5 • 4 marks

Plan circle diameter 7 cm (2)
Front rectangle width 7 cm, height 12 cm (2)

Question 6 • 6 marks

Net has two 14 × 8, two 14 × 5, two 8 × 5 faces, placed validly (2)
Area 2(112+70+40) = 444 cm² (2)
444<800 is necessary but not sufficient (1)
sheet shape/dimensions and net layout also determine fit (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

Visual checking guide: page 127.

TOPIC ANSWERS • 20 MARKS

21. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Consistent 3-D cuboid sketch (1)
dimensions 6,4,3 and one dashed hidden edge correctly identified (1)

Question 2 • 2 marks

Table front 2,4,1; back 3,0,2 gives 12 cubes (1)
5 occupied cells (1)

Question 3 • 2 marks

Front maxima 3,4,2 (1)
right front-to-back 4,3 (1)

Question 4 • 4 marks

Plan has all three front cells and back-left/back-right (2)
Front heights 3,4,2 with clear front direction (2)

Question 5 • 4 marks

Right heights 4 then 3 in stated order (2)
Projection shows the maximum stack along each viewing line rather than the sum of separate stacks (2)

Question 6 • 6 marks

Back becomes 4,0,3; total 14 cubes (2)
Front 4,4,3 (1)
right 4,4 (1)
Plan unchanged because occupied cells are unchanged (2)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

Visual checking guide: page 127.

TOPIC ANSWERS • 20 MARKS

22. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

x = 43° (1)
straight-line angles total 180° (1)

Question 2 • 2 marks

180-39-74 = 67° (1)
triangle angle sum 180° (1)

Question 3 • 2 marks

(180-52)/2 = 64° each (2)

Question 4 • 4 marks

x = 360-90-143-58 = 69° (2)
Exterior 180-64 = 116° (2)

Question 5 • 4 marks

Corresponding 71° because lines are parallel (2)
Adjacent 109° because straight-line angles total 180° (2)

Question 6 • 6 marks

90+104+x+2 x = 360 (2)
3 x = 166; x = 55 1/3°,2 x = 110 2/3° (2)
Quadrilateral sum 360°, not triangle 180° (1)
Check 90+104+55 1/3+110 2/3 = 360 (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

23. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Ordered 0,0,2,4,6,6,9: median 4 (1)
modes 0,6 (1)

Question 2 • 2 marks

Ordered 4,6,7,9,11,13: median 8 (2)

Question 3 • 2 marks

10 results, positions 5 and 6 are 1 and 2; median 1.5 (1)
Mode 2 (1)

Question 4 • 4 marks

Newlist 3,3,4,6,9,30: median 5 (1)
mean 55/6≈9.17 (1)
Original mean 25/5 = 5 (1)
mean increases byabout 4.17 due to the high value (1)

Question 5 • 4 marks

Median(5+5)/2 = 5 (1)
Modes 0,5,9 (2)
Zero is a valid recorded observation (1)

Question 6 • 6 marks

New ordered 0,4,6,8,10,12 (1)
Median 7 (1)
mean 40/6 = 6 2/3 (2)
No repeated value, so no mode (1)
Recorded zero day must be included; removing it changes the observation set (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

24. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Midpoints 2,7,12 (2)

Question 2 • 2 marks

fx 10,56,84 (2: all; 1 for two correct).

Question 3 • 2 marks

Sumfx 150, total f 20 (1)
estimated mean 7.5 books (1)

Question 4 • 4 marks

Midpoints 1.5,5.5,9.5 (1)
fx 9,49.5,47.5 (1)
106/20 = 5.3 items (2)

Question 5 • 4 marks

Midpoints 3,8,13; products 12,96,52 (2)
mean 160/20 = 8 (1)
Modal class 6-10 (1)

Question 6 • 6 marks

Midpoints 1,4,7; fx 8,60,49 (2)
Estimated mean 117/30 = 3.9 (1)
Forecast 90 × 3.9 = 351 damaged items (1)
Exact within-group values are unknown (1)
future deliveries may differ/random variation means a forecast is not certain (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

25. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Mean 35/5 = 7 (1)
range 8 (1)

Question 2 • 2 marks

Amean 8, range 2; Bmean 8, range 7 (1)
Same mean, but A is more consistent (1)

Question 3 • 2 marks

18/40 × 360 = 162°,12/40 × 360 = 108°,10/40 × 360 = 90° (2; sum 360).

Question 4 • 4 marks

Data: rail 16, bus 10, walk 8, cycle 6. Correct bar heights (2)
labelled axes and title (1)
equal scale intervals and consistent bars/gaps (1)

Question 5 • 4 marks

Both means 80/5 = 16 min (2)
Ranges 8 and 12 min (1)
same average, but week 1 smaller spread/more consistent (1)

Question 6 • 6 marks

Decrease(12-10)/12 × 100≈16.7% (2)
New range 25 vs 6 shows greater observed spread, so not more consistent (1)
Different sample sizes/context and representativeness limit causal claims (1)
Lower mean is evidence for a typical improvement on that measure, but not every customer waits less (1)
Avoid a truncated bar-chart axis that exaggerates the change, or another justified misleading presentation (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

Visual checking guide: page 128.

TOPIC ANSWERS • 20 MARKS

26. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Table bus morning 14, evening 10; non-bus morning 9, evening 17; total 50. P(evening) = 27/50 (1)
P(bus and morning) = 14/50 = 7/25 (1)

Question 2 • 2 marks

P(morning given bus) = 14/24 = 7/12 (1)
24 is the restricted group ofbus users (1)

Question 3 • 2 marks

Bus 24+morning 23-overlap 14 = 33 (1)
probability 33/50 (1)

Question 4 • 4 marks

Favourable H 5, H 6 (1)
12 equally likely outcomes (1)
2/12 = 1/6 (2)

Question 5 • 4 marks

4/9 × 3/8 = 12/72 = 1/6 (2)
After first blue,3 blueof 8 counters remain (2)

Question 6 • 6 marks

One of each 5/9 × 4/8 + 4/9 × 5/8 = 40/72 = 5/9 (3)
Same 5/9 × 4/8 +4/9 × 3/8 = 32/72 = 4/9 (2)
Check 5/9+4/9 = 1 (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

Visual checking guide: page 129.

TOPIC ANSWERS • 20 MARKS

27. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

0.36 (1)
36% (1)

Question 2 • 2 marks

45/1000 = 9/200 (1)
4.5% (1)

Question 3 • 2 marks

0.82 (1)
82% (1)

Question 4 • 4 marks

84/120 = 7/10 = 70% (2)
Prediction 350 × 0.7 = 245 (2)

Question 5 • 4 marks

640 × 3/80 = 24 faults (2)
616 non-faulty (2)

Question 6 • 6 marks

Experimental 36/50 = 0.72 (1)
Fair independent next toss remains P(tails) = 0.5 (2)
Predicted heads 500 × 0.5 = 250 (1)
Earlier results do not force compensation (1)
random variation means a particular batch can differ (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

TOPIC ANSWERS • 20 MARKS

28. Worked solutions

Marks in brackets apply to the stated correct stage. Accept an equivalent valid method. For a 2-mark short response, a correct result with a clear required explanation can earn both marks.

Question 1 • 2 marks

Pairs(1,43),(2,49),(3,56),(4,63),(5,67),(6,75). Accurate plots (1 for at least 5); label hours and score (1)

Question 2 • 2 marks

Strong positive correlation (1)
more practice hours tend to accompany higher scores (1)

Question 3 • 2 marks

Reasonable line through the centre, not point-to-point (1)
estimate about 59-61 with guide lines (1)
allow sensible line variation.

Question 4 • 4 marks

Association does not prove causation (2)
scores do not increase by an exact fixed amount, and other factors vary (2)

Question 5 • 4 marks

x 4 is within observed 1-6 hours: interpolation (1)
x 12 outside: extrapolation (1)
x 4 more reliable because it is supported by nearby measurements (1)
trend may change far outside range (1)

Question 6 • 6 marks

48 is around 12 points below the predicted 60 (1)
below the main trend near 3-4 hours (1)
Prediction is not guaranteed (1)
Six paired observations are a small sample (1)
collect more comparable learners/conditions (1)
and investigate possible other factors or repeat measurements to improve reliability (1)

After marking

Part A: ____ /6 Part B: ____ /14 Total: ____ /20. Explain one error below. A correct retry needs both a suitable method and a result that answers the question.

Visual checking guide: page 128.

CHALLENGES 1 AND 2

Mixed challenges: solutions

1. Fundraising decisions

a. 96 × 7.50 = £720 (1)
£720 is 60% (1)
so total 720/0.60 = £1,200 (1)

b. Costs 285+146.80+192.40 = £624.20 (1)
Profit £575.80 (1)
Target met (1)
surplus £25.80 (1)

c. Sponsor.10 × 575.80 = £57.58 (1)
revised donation 575.80+57.58 (1)
= £633.38 (1)

2. Travel, time and cost

a. 27/18 = 1.5 hours = 90 min (1)
total 105 min (1)
leave 08:30 (1)

b. Mileage 54 × 0.28 = £15.12 (1)
total £57.12 (1)
divide 6 (1)
£9.52 each (1)

c. Available arrival 09:55 (1)
subtract 45 min gives 09:10 (1)
40 min later than cycling 08:30 (1)

Check the decision

For each challenge, identify which intermediate result was used in a later step. Make sure the final sentence answers the original decision. Alternative correct solution routes can earn the same total marks.

CHALLENGES 3 AND 4

Mixed challenges: solutions

3. A sign with a curved top

a. Rectangle 3.6 m² (1)
radius 1.2 m (1)
semicircle.5π × 1.2² = 0.72πm² (1)
total 5.861946...→5.86 m², with appropriate sketch (1)

b. Paint 2 × (3.6+0.72π)/4 = 2.930973...litres (2)
divide.75 gives 3.9079..., so 4 tins (1)

c. Cost 4 × 11.80 = £47.20 (2)
Paint covers surface area; perimeter measures only a boundary length (1)

4. Production data and planning

a. Midpoints 4.5,14.5,24.5,34.5 (1)
Products 18,116,147,69 (1)
total 350 (1)
350/20 = 17.5 (1)

b. 40 × 17.5 = 700 items (2)
estimated mean.5 item above 17 (1)

c. Exact smallest/largest observations are unknown (1)
so no exact range comparison can be made (1)
Future workforce/rate/random variation or midpoint approximation limits prediction (1)

Check the decision

For each challenge, identify which intermediate result was used in a later step. Make sure the final sentence answers the original decision. Alternative correct solution routes can earn the same total marks.

CHALLENGES 5 AND 6

Mixed challenges: solutions

5. Drawing and buying shelving

a. Wall 360/30 = 12 cm wide (1)
240/30 = 8 cm high (1)
shelf 100/30 = 3 1/3 cm (1)

b. Spare 3.6-3 × 1 = 0.6 m (1)
four gaps.15 m = 15 cm (1)
drawing gap.5 cm (1)
consistent sketch including four gaps (1)

c. Shelves 3 × 18.40 = £55.20 (1)
discounted £49.68 (1)
plus £7.80 = £57.48 (1)

6. Survey and a prize draw

a. Correct cells and labelled totals morning 40, evening 40, cyclists 32, non-cyclists 48, total 80 (2)
Conditional 18/32 = 9/16 (2)

b. 6/10 × 4/9 +4/10 × 6/9 (2)
= 48/90 = 8/15 (1)

c. Same 6/10 × 5/9+4/10 × 3/9 = 42/90 = 7/15 (1)
Sum 1 (1)
These are separate selection mechanisms with no joint event specified (1)

Check the decision

For each challenge, identify which intermediate result was used in a later step. Make sure the final sentence answers the original decision. Alternative correct solution routes can earn the same total marks.

SECTION A • 15 MARKS

Mock paper 1: solutions

A1 • 3 marks

7.200-3.865 (1)
= 3.335 (1)
Check 3.335+3.865 = 7.2 (1)

A2 • 3 marks

21/12+10/12 (1)
= 31/12 (1)
= 2 7/12 (1)

A3 • 3 marks

4 × 3²-7 (1)
square 9 (1)
result 29 (1)

A4 • 3 marks

12 packs (1)
£84 (1)
216-205 = 11 spare (1)

A5 • 3 marks

Elapsed 150 min (1)
instruction 130 min = 2 1/6 hours (1)
fee £26 (1)

Marking principles

These are author-created marking notes. Award a stage mark when the written evidence or an unambiguous correct outcome establishes that stage. Do not award the same mark twice. Where an earlier number is wrong but a later method is suitable, record the demonstrated method in the error log; use the stated accurate values for the workbook numerical total. Official boards may apply different follow-through rules.

Section A score: ____ /15. Keep section and whole-paper scores separate when reviewing strengths. There is no workbook pass grade.

SECTION B • CALCULATOR

Mock paper 1: solutions

B1: Order a floor covering

a. Area 28.8 m² (1)
waste 3.6 m² (1)
coverage 32.4 m² (1)

b. 18 packs (1)
pack cost £403.20 (1)
delivered £422.20 (1)

c. Pack deal cheaper (1)
by £7.80 (1)
Check 18 × 1.8 = 32.4 m², while 17 gives 30.6 m² (1)

B2: Savings and a purchase

a. 2400 × 1.025² (1)
first year £2460 (1)
final £2521.50 (1)
equivalent direct evaluation earns all 3.

b. 2250 × 0.84 = £1890 (2)
× 1.20 = £2268 (1)

c. Enough (1)
remaining £253.50 (1)
Compound interest includes interest on the previous interest, unlike simple interest on the original only (1)

B3: Average speed and paid time

a. 156/65 = 2.4 h (1)
72/48 = 1.5 h (1)
total 4.3 h = 4 h 18 min (1)

b. Finish 13:03 (1)
pay 4.3 × 14.40 (1)
= £61.92 (1)

c. Distance 228 km (1)
228/4.3≈53.0 km/h (1)
Moving-only average 228/3.9≈58.5 km/h; the stop adds time without distance, so lowers the overall average (1)

SECTION B • CALCULATOR

Mock paper 1: solutions

B4: Data and service comparison

a. Mean 25/5 = 5 (1)
median 4 (1)
range 6 (1)

b. Amean 11, range 4; Bmean 11, range 10 (1 each).

c. Same mean 11 minutes (1)
A more consistent because range 4 rather than 10 (1)

B5: Probability and a cylinder

a. 7.5% (1)
3/40 (1)
complement.925 (1)

b. $V = \pi \times 0.25^2 \times 0.8$ (1)
$= 0.1570796...m^3$ (1)
= 157 litres rounded (1)
Water 109.9557...→110 litres (1)

c. Unrounded 109.9557.../8≈13.744 min (1)
13 complete minutes (1)

RECORD AND REPAIR

Section A: ____ /15
Section B: ____ /45
Total: ____ /60
Topic to revisit: ____
Error pattern and correction: _____

SECTION A • 15 MARKS

Mock paper 2: solutions

A1 • 3 marks

68 × (40+7) = 2720+476 (1)
= 3196 (1)
Estimate 70 × 50 = 3500 or reasonable equivalent (1)

A2 • 3 marks

20% = £64 (1)
2.5% = £8 (1)
total £72 (1)

A3 • 3 marks

-1.2,-0.7,-0.07,0.007 (1)
greatest negative-0.07, closest to zero (1)
0.007>0 (1)

A4 • 3 marks

70 g per portion (1)
1050 g needed (1)
not enough, short 50 g (1)

A5 • 3 marks

14 km cost £30.20 (1)
(32-5)/1.8 = 15 (1)
maximum 15 km (1)

Marking principles

These are author-created marking notes. Award a stage mark when the written evidence or an unambiguous correct outcome establishes that stage. Do not award the same mark twice. Where an earlier number is wrong but a later method is suitable, record the demonstrated method in the error log; use the stated accurate values for the workbook numerical total. Official boards may apply different follow-through rules.

Section A score: ____ /15. Keep section and whole-paper scores separate when reviewing strengths. There is no workbook pass grade.

SECTION B • CALCULATOR

Mock paper 2: solutions

B1: A circular display and budget

a. r 1.8 m (1)
area $3.24\pi \approx 10.17876$ m² (1)
adjusted $3.4992\pi \approx 10.99306$ m² (1)

b. Decoration $3.4992\pi \times 8.5 \approx £93.44$ (2)
Circumference 3.6πm and edging × 2.20≈£24.88 (2)

c. Total £118.32, so enough (1)
£1.68 remaining using separately rounded charges (1)

B2: Scale and placement

a. Wall 8 cm × 4.5 cm (2)
poster 3 cm (1)

b. Real spare 4.8-1.8 = 3 m (1)
sidegap 1.5 m (1)
drawing side gap 2.5 cm (1)

c. Wall 8 × 4.5 cm (1)
centred 3 cm poster width (1)
scale and dimension labels (1)
Workbook tolerance±1 mm.

B3: A grouped-data staffing model

a. Midpoints 2,7,12 (1)
fx 6,63,96 (1)
sum 165, total 20 (1)
mean 8.25 (1)

b. 30 × 8.25 = 247.5 tasks (1)
below 250 (1)
estimated shortfall 2.5 tasks (1)
Fractional model output is a mean-based forecast, not a literal half-completed task.

c. Exact values within groups unknown (1)
future workers, conditions or random variation may differ (1)

SECTION B • CALCULATOR

Mock paper 2: solutions

B4: Angles and transport costs

a. x 67° (1)
y 113° (1)
triangle 180° and straight line 180° as reasons (1)

b. 74 × 1.6 = 118.4 km (2)
38+0.45 × 118.4 = £91.28 (2)

c. 91.28/5 = £18.256→£18.26 (1)
74 miles already describes the return trip (1)
Rounded shares sum slightly above total; this is a rounding effect.

B5: Decimals and a two-way table

a. 0.9 (1)
60 (1)
2/5 (1)

b. Correct labelled cells (1)
row totals 30,30 (1)
column totals 32,28, total 60 (1)
12/60 = 1/5 (1)

c. 18/30 = 60% (1)
denominator 30 because only online learners are eligible (1)

RECORD AND REPAIR

Section A: ____ /15
Section B: ____ /45
Total: ____ /60
Topic to revisit: ____
Error pattern and correction: _____

RECORD FIRST ATTEMPT AND RETRY

Topic score tracker

Topic	First /20	Retry /20	Error / next step
01 Numbers, place value and negat			
02 Whole-number calculation and c			
03 Expressions and formulae			
04 Fractions, decimals and percen			
05 Percentages of amounts			
06 Percentage change and original			
07 Adding, subtracting and orderi			
08 Fractions of quantities			
09 Decimals and sensible accuracy			
10 Calculating with decimals			
11 Ratio and proportion			
12 Order of operations and powers			
13 Money, tax, budgets and compou			
14 Units, conversion factors and			
15 Speed, density, pay and time			
16 Perimeter, area and composite			
17 Volume and surface area			
18 Scale drawings and actual dime			
19 Coordinates in four quadrants			
20 Solids, nets and views			
21 Drawing solids, plans and elev			
22 Angles and geometric reasoning			
23 Median, mode and organised dat			
24 Estimated mean from grouped da			
25 Comparing data and evaluating			
26 Combined events and two-way ta			
27 Probability forms and expected			
28 Scatter diagrams and correlati			

A higher retry score is useful only if the method is understood. Try explaining a similar problem with a changed condition before marking the skill secure.

USE RESULTS TO CHOOSE YOUR NEXT ACTION

Error log and mock review

Code	Error cause	Useful repair
R	Reading or selecting data	Underline the required output,conditions and units.
M	Method choice	Return to the matching lesson and explain why a method fits.
C	Calculation	Redo one step using a different method or inverse check.
U	Units	Write units at every stage and match them before combining.
A	Accuracy / rounding	Retain precision;separate rounding from whole-purchase decisions.
E	Explanation	Quote a figure and state how it supports the decision.

Question	Code	Correction / evidence	Retry date

Mock summary

Paper	A /15	B /45	Total /60	Two targets
1				
2				

Do not turn these scores into a claimed official pass percentage. Compare error causes, whether the approach was independent and whether your explanations were complete. Then use a current official sample from your board.

SHARED CONTENT • INDEPENDENT PRACTICE

Curriculum and official assessment sources

This companion follows the same curriculum basis and board-verification scope as the lesson notebook. Sources were reviewed on 13 November 2026 during development of the pair. This is a shared-content alignment, not certification of every current board handbook. Confirm live arrangements with your centre.

S1 • DfE: Maths Functional Skills subject content

Shared Level 2 content, including the 28 numbered points and inherited knowledge.

Open official source

S2 • Ofqual: mathematics conditions and requirements

Shared calculator/non-calculator and skill/problem-solving proportions.

Open official source

S3 • City & Guilds: Level2 Sample4 calculator paper

Public sample reviewed for breadth of assessment demand; no item copied.

Open official source

S4 • Open Awards: Level2 sample assessment and mark scheme

Public sample package reviewed; not a current live paper.

Open official source

Assessment blueprint for each original mock

Classification	Section A	Section B	Total
Non-calculator / calculator	15 NC	45 C	60
Underpinning skill marks	9 (A1-A3)	6 (B4a,B5a)	15
Problem-solving marks	6 (A4-A5)	39 (remaining B parts)	45

This blueprint is an author classification for practice. No independent validation or awarding-body approval is claimed. Topic sets and mixed challenges use learning-focused mark distributions rather than this mock blueprint.

PREPARE FOR YOUR OWN AWARDING ORGANISATION

Feedback sources and final checks

S5 • Pearson: scaffolded Level2 calculator long questions

Official teaching support reviewed for connected problem-solving steps.

Open official source

S6 • NCFE: December2019 chief examiner report

Historical feedback on method, units, reasoning and common misconceptions; not current timing or pass rules.

Open official source

S7 • Pearson: You Are The Assessor,Level2 Maths Question1

Assessor exemplars support visible working; no official mark scheme is reproduced.

Open official source

Access and scope

Public samples and official teaching resources informed the broad question demands. Some released past-paper downloads were not reliably readable and some newer assessments need authorised centre access. No restricted or live paper was used. These questions are independently authored, not a reconstruction of an official paper.

Before taking a live exam

• Confirm the awarding organisation, qualification number, delivery mode and current timings.

• Practise the approved calculator and any onscreen drawing or graph tools.

• Show working, substitutions, units and a final contextual statement.

• Check scales, axis labels, rounding, capacity decisions and every requested part.

• Use the companion lesson notebook to repair understanding, then return to unfamiliar practice.

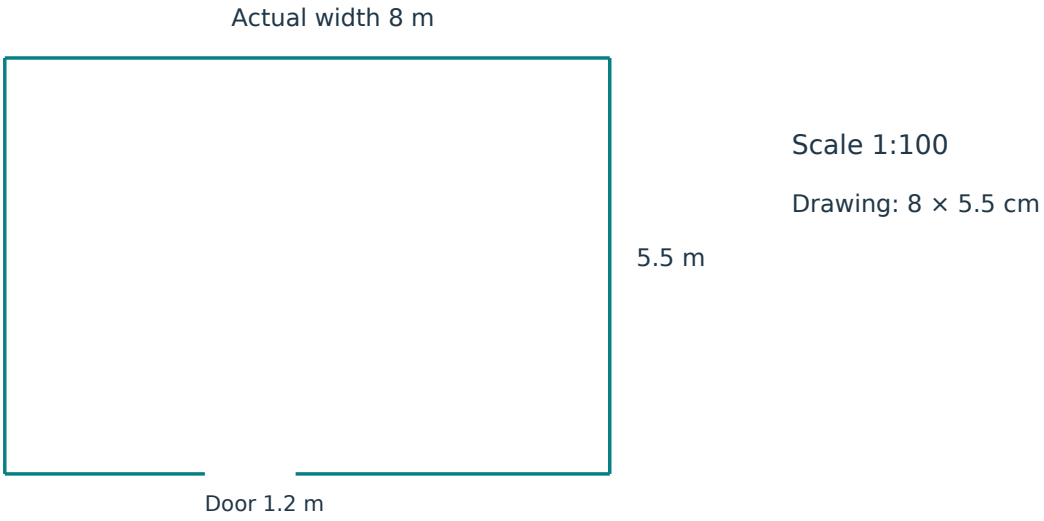
Editorial check before commercial release: confirm publisher/rights-holder details and arrange independent subject-specialist proofreading. Keep a dated amendment record. This notebook supports preparation; it cannot guarantee an exam pass.

TOPICS 18 AND 19 • USE THE DIMENSIONS, NOT A SCREEN RULER

Visual checks: scale and coordinates

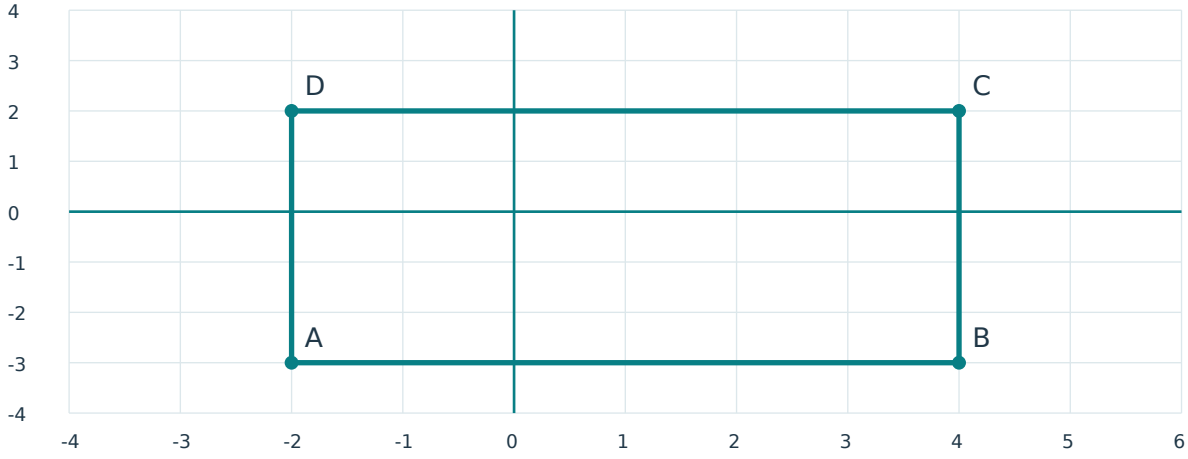
Topic 18, question 4: room plan

A correct 1:100 plan is 8 cm by 5.5 cm, with a 1.2 cm doorway. The drawing below uses these physical lengths at actual-size printing. The door can be placed elsewhere on a side if its gap is correct. Your own diagram needs the scale and actual dimensions labelled.



Topic 19, question 4: rectangle

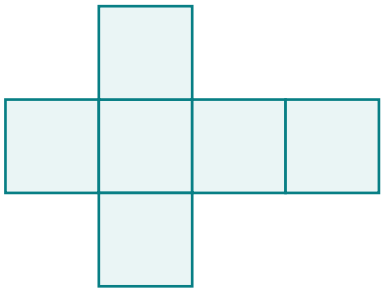
The missing vertex isD(-2,2). Side lengths are 6 and 5 grid units; area 30 square units and perimeter 22 units. Labels identify the same sequence of vertices as the question.



TOPICS 20 AND 21

Visual checks: nets and elevations

Topic 20, question 4: one valid cube net



One valid cube net

Six equal square faces

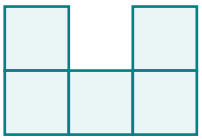
Fold along shared edges

Six equal squares fold into four side faces, a top and a base. Rotations and reflections of valid nets are also acceptable. A matching face count alone does not prove that any arrangement folds without overlap.

Topic 21, questions 4-5: original stack model

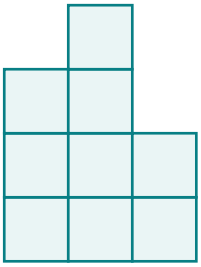
Front row 2,4,1; back row 3,0,2. The drawings below show occupied cells in the plan and unit-square outlines in the two elevations. Depth order in the right view is front then back.

Plan

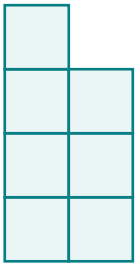


FRONT ↑

Front elevation



Right elevation



Front → back

Updated model in question 6: back row 4,0,3; total 14 cubes. Front elevation heights become 4,4,3. Right elevation becomes 4,4. The occupied footprint is unchanged, so its plan is unchanged.

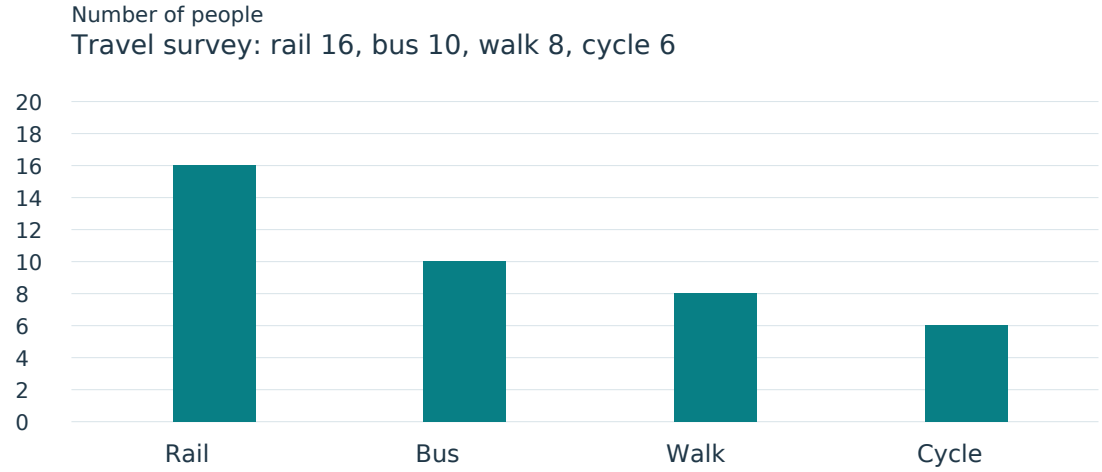
WHAT AN ELEVATION SHOWS

Use the greatest height along each line of sight. Cubes behind one another are not stacked on top of one another in an elevation.

TOPICS 25 AND 28

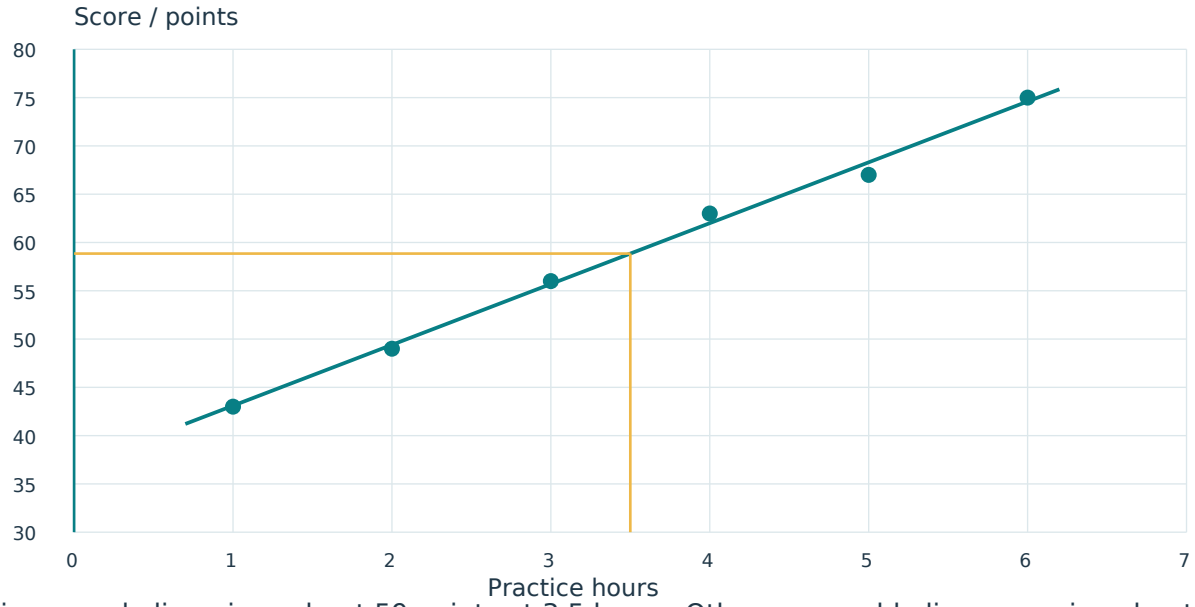
Visual checks: bars and scatter

Topic 25, question 4: travel bar chart



Check a frequency axis from zero, equal intervals, category labels and bars of heights 16,10,8,6. The bar width and colour need not match this example. Total 40 people.

Topic 28: scatter points and one reasonable line



This example line gives about 59 points at 3.5 hours. Other reasonable lines can give about 59-61. The points show strong positive correlation. Do not join every point, and do not assume the line must pass through the origin.

TOPIC 26 • SAMPLE SPACE AND TREE

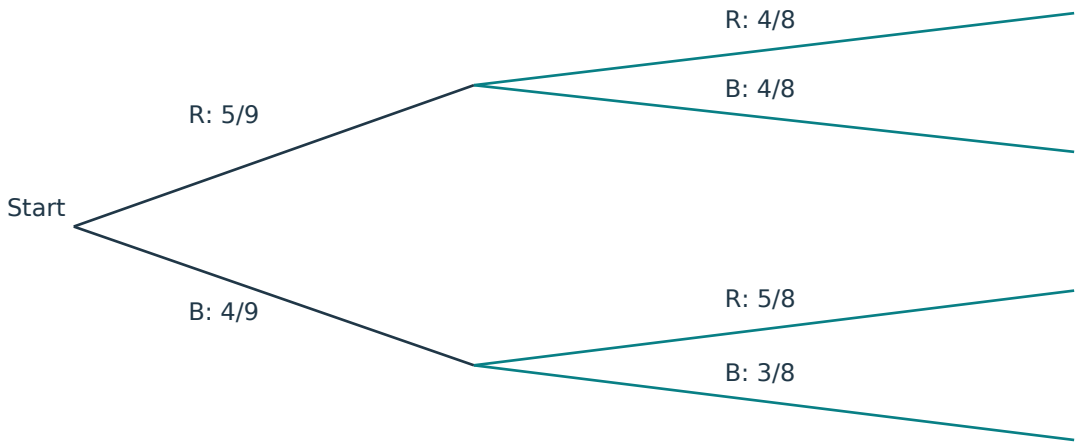
Visual checks: combined probability

Question 4: a coin and a die

Coin / die	1	2	3	4	5	6
Head	H1	H2	H3	H4	H5 ✓	H6 ✓
Tail	T1	T2	T3	T4	T5	T6

All 12 outcomes are equally likely under the stated fair, independent model. The event head and score at least 5 containsH 5 andH 6, so probability 2/12 = 1/6. The tick marks identify favourable cells; they are not additional outcomes.

Questions 5-6: five red and four blue, no replacement



Both blue:4/9 × 3/8 = 1/6. One of each:5/9 × 4/8 + 4/9 × 5/8 = 5/9. Same colour:5/9 × 4/8 + 4/9 × 3/8 = 4/9. The last two events exhaust all possibilities, so 5/9+4/9 = 1.

CHECK EVERY BRANCH

The probabilities leaving any branch point must sum to one. Without replacement, the denominator is 8 on the second draw because one counter has been removed.