

# Mathematics Level 5

## End-of-year review

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## End-of-year review

End-of-year review R5 · All six strands · End-of-Level-5 check

### Mathematics Level 5 (Year 5) · Victorian Curriculum 2.0

**Codes assessed:** VC2M5N02 · VC2M5N06 · VC2M5N07 · VC2M5N10 · VC2M5N01 · VC2M5N03 · VC2M5N05 · VC2M5N04 · VC2M5N08 · VC2M5N09 · VC2M5A01 · VC2M5A02 · VC2M5M01 · VC2M5M02 · VC2M5M03 · VC2M5M04 · VC2M5SP01 · VC2M5SP02 · VC2M5SP03 · VC2M5ST01 · VC2M5ST02 · VC2M5ST03 · VC2M5P01 · VC2M5P02

Name: \_\_\_\_\_ Date: \_\_\_\_\_

|                      |                                                                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Total marks</b>   | 50                                                                                                                                                                                  |
| <b>Guidance time</b> | 55 minutes in total — about 1 minute per mark plus 5 minutes reading                                                                                                                |
| <b>Sittings</b>      | This paper may be run in one sitting or split across two sittings. A split that works well: sitting 1 = Sections A and B (24 marks), sitting 2 = Sections C, D, E and F (26 marks). |
| <b>Timing</b>        | This is a classroom check, not an exam. There is no strict time limit. Your teacher will let you finish.                                                                            |
| <b>Equipment</b>     | A ruler and a protractor. The protractor is needed for Question 16. The grids, graphs and shapes you need are printed on the paper.                                                 |
| <b>Calculators</b>   | No question on this paper needs a calculator. Where a question asks for a strategy, show your mental or written working.                                                            |

This paper checks what you learned across all of Level 5: Number, Algebra, Measurement, Space, Statistics and Probability. Attempt every question. Show your working where the question asks for it.

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### Section A — Number (20 marks)

#### Question 1 — Factors and multiples (2 marks)

- (a) Express 18 as a product of its factors in every way. (1 mark)
  - (b) The **lowest common multiple** of two numbers is the smallest multiple they share. List the first few multiples of 6 and the first few multiples of 8, then find the lowest common multiple of 6 and 8. (1 mark)
- 

#### Question 2 — Multiplying with a strategy of your choice (2 marks)

Use a mental or written strategy of your choice to work out  $26 \times 43$ . Show your working. (2 marks)

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#### Question 3 — Division and the remainder (2 marks)

79 students are going to camp. Each tent holds 6 students.

- (a) Work out  $79 \div 6$ . Give the answer as a whole number and a remainder. (1 mark)
  - (b) How many tents are needed so that all 79 students have a tent? Explain your answer. (1 mark)
- 

#### Question 4 — Follow an algorithm (2 marks)



Follow this algorithm. Start at 48.

Step 1: Write down your number.

Step 2: Is your number even? If yes, halve it. If no, add 1. Write down the new number.

Step 3: Repeat Step 2 until your number is 1. Stop.

(a) Write down every number the algorithm makes, in order. (1 mark)

(b) How many times was Step 2 repeated? (1 mark)

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**Question 5 — Decimal place value (2 marks)**

(a) In the decimal 4.275, what is the value of the digit 7? (1 mark)

(b) Put these decimals in order from smallest to largest: 1.708, 1.78, 1.078. (1 mark)

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**Question 6 — Ordering fractions (2 marks)**

(a) Put these fractions in order from smallest to largest:  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$ . (1 mark)

(b) Which is larger:  $1\frac{1}{4}$  or  $\frac{9}{8}$ ? Show how you know. (1 mark)

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**Question 7 — Adding and subtracting fractions (2 marks)**

Show your renaming.

(a)  $\frac{5}{6} - \frac{1}{3}$  (1 mark)

(b)  $1\frac{1}{4} + \frac{3}{8}$  (1 mark)

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**Question 8 — Percentages (2 marks)**

(a) Write 50% as a fraction and as a decimal. (1 mark)

(b) Which is larger: 0.6 or 55%? Explain how you know. (1 mark)

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**Question 9 — Estimating and checking (2 marks)**

(a) Round 487 and 312 to the nearest hundred, then estimate  $487 + 312$ . (1 mark)

(b) Priya works out  $487 + 312 = 7\,990$ . Use your estimate to decide whether 7 990 is a reasonable answer. Explain. (1 mark)

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**Question 10 — Modelling a money problem (2 marks)**

Class 5K is buying prizes for the school fete. A pack of stickers costs \$3, and the class needs 24 packs.

(a) Write a number sentence for the total cost. (1 mark)

(b) The class has \$100 to spend on prizes. Do they have enough money? Answer in a sentence about the money. (1 mark)

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## Section B — Algebra (4 marks)

### Question 11 — Inverse operations and fact families (2 marks)

- (a) One fact in a family is  $6 \times 7 = 42$ . Write the other three facts in the same family. (1 mark)
  - (b) Use the inverse operation to work out  $240 \div 20$ . Show your thinking. (1 mark)
- 

### Question 12 — Unknown values (2 marks)

- (a) Find the unknown.
  - (b)  $8 \times \square = 56$
  - (ii)  $\square \div 4 = 9$  (1 mark)
  - (b) True or false:  $15 \div 3 = 30 \div 6$ . Explain how you know. (1 mark)
- 

## Section C — Measurement (9 marks)

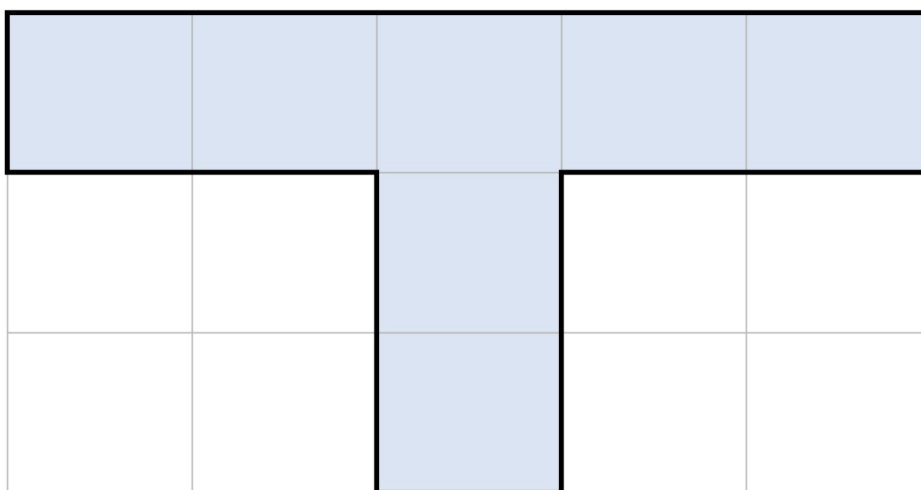
### Question 13 — Choosing metric units (2 marks)

- (a) Choose the best unit for each measurement from: mm, cm, m, km, g, kg, mL, L.
  - (b) the length of a classroom
  - (ii) the mass of a banana
  - (iii) the capacity of a bath
  - (iv) the distance from Melbourne to Ballarat (1 mark)
  - (b) Mai measures her long jump as 147 cm. Write this length using two units, metres and centimetres. (1 mark)
- 

### Question 14 — Perimeter and area (2 marks)

The T-shape below is drawn on a grid of  $1 \text{ cm}^2$  squares.

Each small square is  $1 \text{ cm}^2$ .



*A T-shape on a grid of  $1 \text{ cm}^2$  squares. Each small square is  $1 \text{ cm}^2$ .*

- (a) Find the perimeter of the T-shape. (1 mark)
  - (b) Find the area of the T-shape. (1 mark)
- 

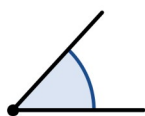
**Question 15 — 12-hour and 24-hour time (2 marks)**

- (a) Convert to 24-hour time.
  - (b) 7:20 am
  - (ii) 3:45 pm (1 mark)
  - (b) Convert to 12-hour time, with am or pm.
  - (c) 00:15
  - (ii) 21:05 (1 mark)
- 

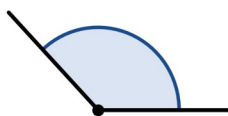
**Question 16 — Angles in degrees (3 marks)**

Angles a, b, c and d are printed below. You need your protractor and your ruler.

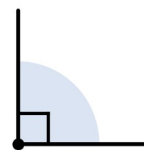
Measure each angle with your protractor



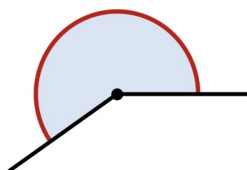
a



b



c



d

Four angles drawn at their exact sizes, labelled a, b, c and d. Angle a is 47 degrees, angle b is 133 degrees, angle c is a right angle of 90 degrees marked with a small square, and angle d is a reflex angle of 215 degrees with the big turn shaded.

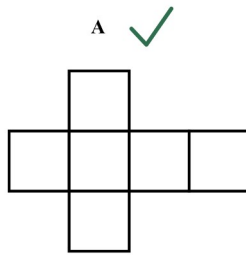
- (a) Estimate angle a first, then measure it with your protractor. (1 mark)
  - (b) Angle d is a reflex angle. Measure it, and show how you used the full turn. (1 mark)
  - (c) Construct an angle of  $70^\circ$ . Give the angle its name. (1 mark)
- 

## Section D — Space (6 marks)

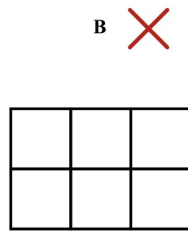
### Question 17 — Nets (2 marks)

Four flat shapes, A, B, C and D, are drawn below.

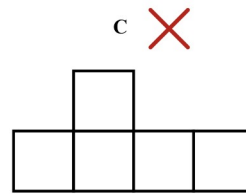
Which of these fold into a cube? Predict, then test.



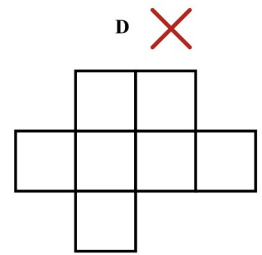
6 faces, nothing overlaps  
folds into a cube



6 faces, but two would overlap  
does NOT fold into a cube



only 5 faces — a cube needs 6  
does NOT fold into a cube



7 faces — one too many  
does NOT fold into a cube

Count the faces first, then check that no two faces land in the same place.

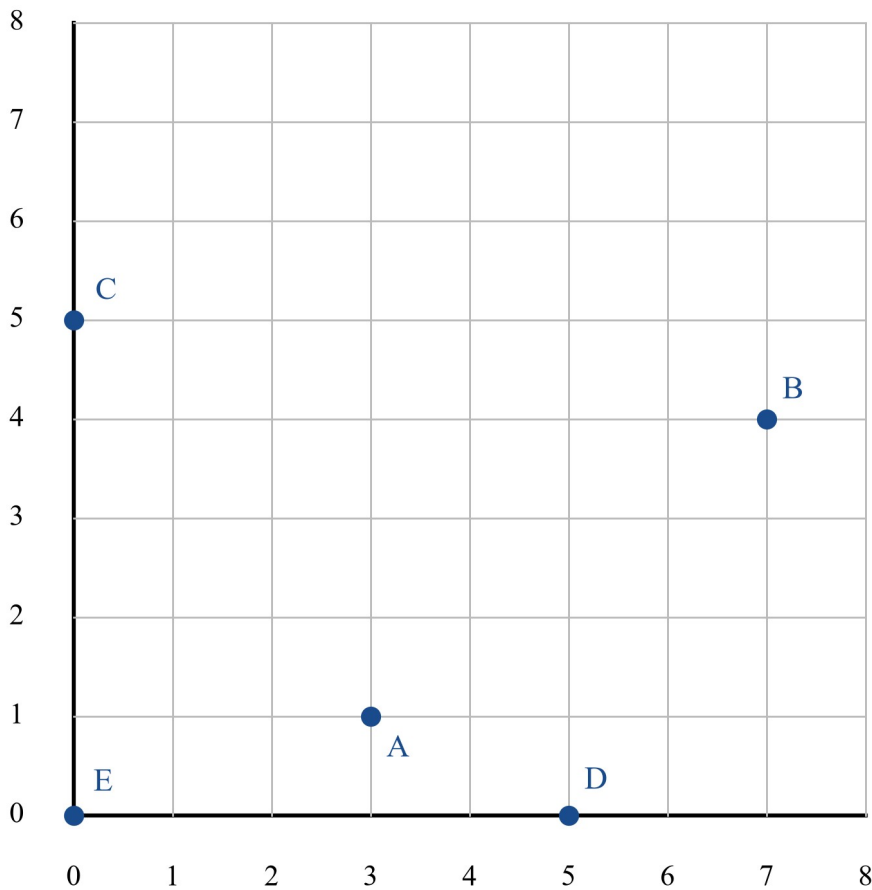
Four flat shapes made of squares, labelled A, B, C and D. A is six squares in a cross and folds into a cube. B is six squares in a two-by-three block, C is only five squares and D is seven squares; B, C and D do not fold into a cube.

- Which one folds into a cube? (1 mark)
- Explain why C cannot fold into a cube. (1 mark)

### Question 18 — Coordinates and movement (2 marks)

The coordinate grid below shows five points.





A coordinate grid from 0 to 8 with five blue points: A at (3, 1), B at (7, 4), C at (0, 5), D at (5, 0) and E at (0, 0).

- Write the coordinates of point B and point E. (1 mark)
- You start at (1, 1). You move 3 squares to the right, then 2 squares up. What are the coordinates of your new position? (1 mark)

### Question 19 — Transformations (2 marks)

- Name the transformation.
  - A shape slides to a new position. It does not turn and it does not flip.
- A shape is flipped over a mirror line. (1 mark)
  - A shape is rotated about a point. What changes, and what stays the same? (1 mark)

## Section E — Statistics (7 marks)

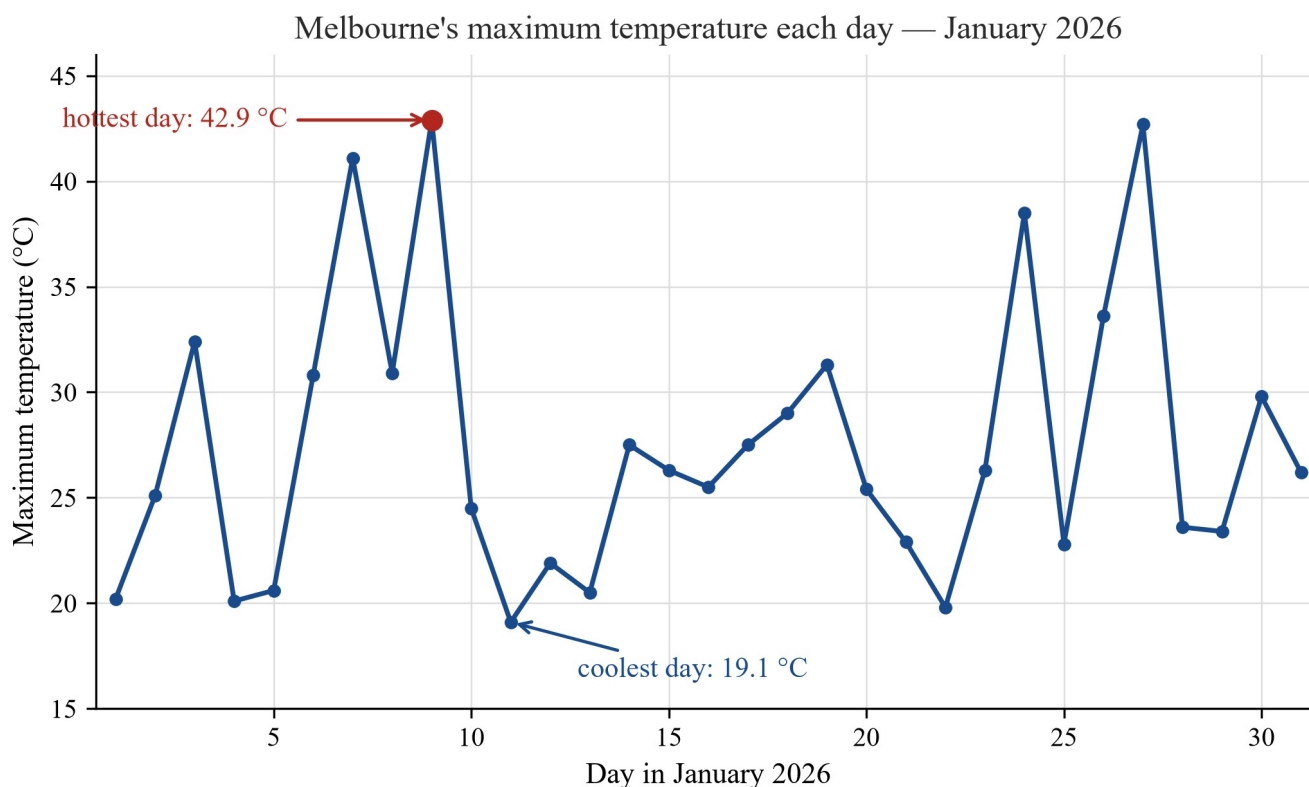
### Question 20 — Types of data and the mode (2 marks)

Class 5W asks every student three things: their favourite sport; a film rating from 1 to 5 stars; and the number of people who live in their home.

- Classify each of the three data sets as nominal categorical, ordinal categorical, or discrete numerical. (1 mark)
- Seven students name their favourite fruit: apple, banana, apple, orange, banana, apple, banana. The **mode** is the value that appears most often. Find the mode. (1 mark)

### Question 21 — Reading a line graph (3 marks)

The line graph shows the daily maximum temperatures in Melbourne for January 2026.



A line graph of Melbourne's maximum temperature each day in January 2026, with the hottest day marked at 42.9 degrees Celsius on 9 January and the coolest day marked at 19.1 degrees Celsius on 11 January.

Source: Bureau of Meteorology, Daily Weather Observations for Melbourne (Olympic Park), Victoria, retrieved 20 August 2026.

- What was the maximum temperature on 9 January? (1 mark)
- Describe what happened to the maximum temperature from 9 January to 11 January. Use the dates and the numbers in your sentence. (1 mark)
- What was the coolest maximum temperature in this month, and on what date did it happen? (1 mark)

## Question 22 — Planning a survey (2 marks)

Class 5W wants to find out how students travel to school. They draft two questions.

Question A: "Walking is the best way to get to school, don't you think?"

Question B: "How do you usually get to school? Walk, ride, car, bus or other?"

- Which question is better for a statistical investigation? (1 mark)
- Explain why the other question will not collect fair data. (1 mark)

## Section F — Probability (4 marks)

### Question 23 — Listing outcomes and fairness (2 marks)

- A bag holds 3 red counters and 1 blue counter. One counter is drawn without looking. List the possible outcomes. Are they equally likely? Explain. (1 mark)
- Two players share a fair die. Player 1 wins if the die shows 1, 2 or 3. Player 2 wins if the die shows 4, 5 or 6. Is this game fair? Explain. (1 mark)

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**Question 24 — Repeated trials and frequency (2 marks)**

Class 5R spun a three-colour spinner 20 times. The results were: red 12, blue 5, green 3.

- (a) Report the **frequency** of red — how often red happened — as “out of 20” and as a fraction. (1 mark)
  - (b) Which colour was most frequent? Based on these 20 trials, which colour seems most likely? (1 mark)
- 

**Total: 50 marks**

## Marking guide

*Teacher-facing. R5 is a classroom check, not an exam: untimed in principle, with a 55-minute total guidance time (about 1 minute per mark plus 5 minutes reading), and it may be split across two sittings — for example Sections A and B in one sitting and Sections C, D, E and F in the other. Equipment is permitted as stated on the paper (ruler; protractor for Question 16; the grids, graphs and shapes are printed). No question needs a calculator or a digital tool, and no “no calculator” rule is printed — Level 5 carries no calculator-free CD (TOC D10). Every item is short-answer or worked-response; there is no multiple choice. The paper is cumulative and assesses no new content: every CD below was already assessed in its chapter test, T1–T8 (TOC §7). All parts carry whole marks.*

### Mark map

| Section      | Strand      | Questions           | Marks     | Codes assessed                                                                                                       |
|--------------|-------------|---------------------|-----------|----------------------------------------------------------------------------------------------------------------------|
| A            | Number      | Q1–Q10              | 20        | VC2M5N02<br>VC2M5N06<br>VC2M5N07<br>VC2M5N10<br>VC2M5N01<br>VC2M5N03<br>VC2M5N05<br>VC2M5N04<br>VC2M5N08<br>VC2M5N09 |
| B            | Algebra     | Q11–Q12             | 4         | VC2M5A01<br>VC2M5A02                                                                                                 |
| C            | Measurement | Q13–Q16             | 9         | VC2M5M01<br>VC2M5M02<br>VC2M5M03<br>VC2M5M04                                                                         |
| D            | Space       | Q17–Q19             | 6         | VC2M5SP01<br>VC2M5SP02<br>VC2M5SP03                                                                                  |
| E            | Statistics  | Q20–Q22             | 7         | VC2M5ST01<br>VC2M5ST02<br>VC2M5ST03                                                                                  |
| F            | Probability | Q23–Q24             | 4         | VC2M5P01<br>VC2M5P02                                                                                                 |
| <b>Total</b> |             | <b>24 questions</b> | <b>50</b> | <b>all 24 CDs</b>                                                                                                    |

Each of the 24 CDs is worth at least 2 marks on its own question, so a section’s result reads as that strand’s result, and an under-taught CD shows up as a short question rather than hiding inside a long one.

### Allocating marks, question by question

| Q | CD       | Mark allocation                                                                                                                                                                                                                                                               |
|---|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | VC2M5N02 | (a) 1 for all three factor pairs of 18 ( $1 \times 18$ , $2 \times 9$ , $3 \times 6$ ); accept the pairs in any order, products written either way round. (b) 1 for both multiples lists (at least to 24) and an LCM of 24; accept an LCM of 24 reached from one shared list. |
| 2 | VC2M5N06 | 1 for an efficient mental or written strategy shown in the working (doubling, factorising and rearranging, place-value                                                                                                                                                        |

| Q  | CD       | Mark allocation                                                                                                                                                                                                                                                                                                                                                      |
|----|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |          | partitioning, or the standard algorithm); 1 for 1 118. A correct answer with no working earns 1 mark only. Award the strategy mark for any efficient strategy, not just the ones modelled in 1B.                                                                                                                                                                     |
| 3  | VC2M5N07 | (a) 1 for 13 remainder 1. (b) 1 for 14 tents with a reason that refers to the leftover student; 13 tents leaves one student without a tent, so the remainder is rounded up here.                                                                                                                                                                                     |
| 4  | VC2M5N10 | (a) 1 for the full ordered list 48, 24, 12, 6, 3, 4, 2, 1. (b) 1 for 7 repeats.                                                                                                                                                                                                                                                                                      |
| 5  | VC2M5N01 | (a) 1 for 7 hundredths (0.07). (b) 1 for 1.078, 1.708, 1.78.                                                                                                                                                                                                                                                                                                         |
| 6  | VC2M5N03 | (a) 1 for $\frac{5}{8}, \frac{3}{4}, \frac{7}{8}$ ; accept renamed eighths ( $\frac{5}{8}, \frac{6}{8}, \frac{7}{8}$ ) shown as the reason. (b) 1 for $1\frac{1}{4}$ larger, with the renaming shown — $1\frac{1}{4} = \frac{10}{4} = \frac{10}{8}$ and $\frac{10}{8} > \frac{9}{8}$ , or $1\frac{1}{4} = 1\frac{2}{8}$ compared with $\frac{9}{8} = 1\frac{1}{8}$ . |
| 7  | VC2M5N05 | (a) 1 for $\frac{1}{2}$ with the renaming $\frac{1}{3} = \frac{2}{6}$ shown; accept the unsimplified $\frac{3}{6}$ .<br>(b) 1 for $1\frac{5}{8}$ with the renaming $\frac{1}{4} = \frac{2}{8}$ shown.                                                                                                                                                                |
| 8  | VC2M5N04 | (a) 1 for $\frac{1}{2}$ (or $\frac{50}{100}$ ) and 0.5. (b) 1 for 0.6 larger with a comparison shown — $0.6 = 0.60 = 60\%$ and $60\% > 55\%$ , or $55\% = 0.55$ and $0.6 > 0.55$ .                                                                                                                                                                                   |
| 9  | VC2M5N08 | (a) 1 for $500 + 300$ and an estimate of about 800. (b) 1 for “not reasonable” with a comparison to the estimate — 7 990 is about ten times the estimate, so something slipped.                                                                                                                                                                                      |
| 10 | VC2M5N09 | (a) 1 for a correct number sentence, $24 \times 3 = \square$ (or $3 \times 24 = \square$ ). (b) 1 for a sentence that solves and interprets: $24 \times 3 = \$72$ , so yes, \$72 is less than                                                                                                                                                                        |

| Q  | CD        | Mark allocation                                                                                                                                                                                                                                                                                                             |
|----|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |           | \$100, with \$28 to spare. The number on its own earns 0 — the interpret step is the mark.                                                                                                                                                                                                                                  |
| 11 | VC2M5A01  | (a) 1 for all three facts: $7 \times 6 = 42$ , $42 \div 6 = 7$ , $42 \div 7 = 6$ . (b) 1 for 12 reached through the inverse — $20 \times \square = 240$ and $20 \times 12 = 240$ .                                                                                                                                          |
| 12 | VC2M5A02  | (a) 1 for both: $\square = 7$ and $\square = 36$ . (b) 1 for “true” with both sides evaluated — $15 \div 3 = 5$ and $30 \div 6 = 5$ , so both sides name the same number.                                                                                                                                                   |
| 13 | VC2M5M01  | (a) 1 for all four: m, g, L, km. (b) 1 for 1 m 47 cm.                                                                                                                                                                                                                                                                       |
| 14 | VC2M5M02  | (a) 1 for 16 cm by adding side lengths; accept a correct walk-around total with the sides listed. (b) 1 for 7 cm <sup>2</sup> by counting squares. No area formula is in play at this level — award for counting, not for $l \times w$ .                                                                                    |
| 15 | VC2M5M03  | (a) 1 for both: 07:20 and 15:45. (b) 1 for both: 12:15 am and 9:05 pm.                                                                                                                                                                                                                                                      |
| 16 | VC2M5M04  | (a) 1 for a measured angle of $47^\circ (\pm 2^\circ)$ with an estimate recorded. (b) 1 for $215^\circ (\pm 2^\circ)$ with the full turn used — $360^\circ - 145^\circ = 215^\circ$ , or measuring the small turn and subtracting from $360^\circ$ . (c) 1 for a constructed angle of $70^\circ (\pm 2^\circ)$ named acute. |
| 17 | VC2M5SP01 | (a) 1 for A. (b) 1 for a reason that holds — C has only 5 squares and a cube has 6 faces.                                                                                                                                                                                                                                   |
| 18 | VC2M5SP02 | (a) 1 for both: B (7, 4) and E (0, 0); the horizontal coordinate comes first. (b) 1 for (4, 3).                                                                                                                                                                                                                             |
| 19 | VC2M5SP03 | (a) 1 for both: translation and reflection; accept slide and flip as the names used in the chapter. (b) 1 for: position (and orientation) change; shape and size stay the same.                                                                                                                                             |
| 20 | VC2M5ST01 | (a) 1 for all three: favourite sport — nominal categorical; film rating — ordinal categorical; number of people in the home — discrete numerical. (b) 1 for apple <b>and</b> banana — each appears 3 times, so there are two modes; a single mode earns 0.                                                                  |
| 21 | VC2M5ST02 | (a) 1 for 42.9 °C. (b) 1 for a sentence                                                                                                                                                                                                                                                                                     |

| Q  | CD        | Mark allocation                                                                                                                                                                                                                                                                            |
|----|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |           | that names the drop with both numbers — it fell from 42.9 °C on 9 January to 19.1 °C on 11 January, a drop of 23.8 °C in two days; the numbers carry the mark. (c) 1 for 19.1 °C on 11 January.                                                                                            |
| 22 | VC2M5ST03 | (a) 1 for Question B. (b) 1 for a reason that names the fault — Question A pushes an opinion (“don’t you think?”) and is not objective; Question B is objective and offers a balanced set of answer choices.                                                                               |
| 23 | VC2M5P01  | (a) 1 for the outcomes red or blue, with “not equally likely” and a reason — 3 red counters against 1 blue, so red is more likely. (b) 1 for “fair” with a reason — each player wins on 3 of the 6 equally likely outcomes, so both have the same chance.                                  |
| 24 | VC2M5P02  | (a) 1 for “12 out of 20” and the fraction $\frac{12}{20}$ ; accept the simplified $\frac{3}{5}$ .<br>No decimal or percentage forms earn the mark — Level 5 reports frequencies as counts, “out of” and fractions only. (b) 1 for red most frequent and red most likely from these trials. |

## Diagnostic mapping to the Level 5 achievement standard

The paper is sectioned by strand so each section’s mark can be read against the Level 5 achievement standard. The extracts below are carried on the assessed CDs in `maths_5.json` and are quoted verbatim.

| Strand | Questions | Achievement-standard extract<br>(verbatim, <code>maths_5.json</code> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number | Q1–Q10    | <p>“They express natural numbers as products of factors and identify multiples and divisors.” · “Students use their proficiency with multiplication facts and efficient mental and written calculation strategies to multiply large numbers by one- and two-digit numbers and divide by one-digit numbers.” ·</p> <p>“They design and use algorithms to identify and explain patterns in the factors and multiples of numbers.” ·</p> <p>“Students use place value to write and order decimals including decimals greater than one.” ·</p> <p>“Students order and represent, add</p> |

| Strand      | Questions | Achievement-standard extract<br>(verbatim, maths_5.json)                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |           | and subtract fractions with the same or related denominators.” · “They represent common percentages and connect them to their fraction and decimal equivalents.” · “They check the reasonableness of their calculations using estimation.” · “Students use mathematical modelling to solve financial and other practical problems, formulating and solving problems, choosing arithmetic operations and interpreting results in terms of the situation.” |
| Algebra     | Q11–Q12   | “They apply properties of numbers and operations to find unknown values in numerical equations involving multiplication and division.”                                                                                                                                                                                                                                                                                                                   |
| Measurement | Q13–Q16   | “Students choose and use appropriate metric units to measure the attributes of length, mass and capacity, and to solve problems involving perimeter and area.” · “Students convert between 12- and 24-hour time.” · “They estimate, construct and measure angles in degrees.”                                                                                                                                                                            |
| Space       | Q17–Q19   | “Students connect objects to their two-dimensional nets.” · “Students use grid coordinates to locate and move positions.” · “They perform and describe the results of transformations and identify any symmetries.”                                                                                                                                                                                                                                      |
| Statistics  | Q20–Q22   | “Students plan and conduct statistical investigations that collect nominal and ordinal categorical and discrete numerical data with and without digital tools.” · “They interpret and compare data represented in line graphs.”                                                                                                                                                                                                                          |
| Probability | Q23–Q24   | “Students conduct repeated chance experiments, list the possible outcomes, estimate likelihoods and make comparisons between those with and without equally likely outcomes.”                                                                                                                                                                                                                                                                            |

The conduct and communicate verbs of VC2M5ST03 and VC2M5N09 are evidenced by tasks I1 and I2 (TOC §7); Q10 and Q22 here carry only the written halves — formulating a number sentence and choosing a survey question — exactly as their chapter tests do.



## Score

| Section                         | Marks      |
|---------------------------------|------------|
| Section A — Number              | /20        |
| Section B — Algebra             | /4         |
| Section C — Measurement         | /9         |
| Section D — Space               | /6         |
| Section E — Statistics          | /7         |
| Section F — Probability         | /4         |
| <b>End-of-year review total</b> | <b>/50</b> |

A section mark that falls well below the chapter-test mark for the same strand points to retention, not to missing coverage — every CD here was taught and assessed earlier in the year. R5 is the Year 5 exit check and the readiness check for Level 6 (\_build6\).

## Solutions

*Teacher-facing. R5 is a classroom check, not an exam: untimed in principle, with a 55-minute total guidance time, and it may be split across two sittings. Equipment is permitted as stated on the paper, and no question needs a calculator. The mark allocation for every part is in the Marking guide above.*

### Answer key

| Q  | Part | Answer                                                                     | Marks |
|----|------|----------------------------------------------------------------------------|-------|
| 1  | (a)  | $1 \times 18, 2 \times 9, 3 \times 6$                                      | 1     |
| 1  | (b)  | Multiples of 6: 6, 12, 18, 24, ...; multiples of 8: 8, 16, 24, ...; LCM 24 | 1     |
| 2  | —    | 1 118, efficient strategy shown                                            | 2     |
| 3  | (a)  | 13 remainder 1                                                             | 1     |
| 3  | (b)  | 14 tents — the leftover student still needs a tent                         | 1     |
| 4  | (a)  | 48, 24, 12, 6, 3, 4, 2, 1                                                  | 1     |
| 4  | (b)  | 7 repeats                                                                  | 1     |
| 5  | (a)  | 7 hundredths (0.07)                                                        | 1     |
| 5  | (b)  | 1.078, 1.708, 1.78                                                         | 1     |
| 6  | (a)  | $\frac{5}{8}, \frac{3}{4}, \frac{7}{8}$                                    | 1     |
| 6  | (b)  | $1\frac{1}{4}$ (it is $\frac{10}{8}$ , and $\frac{10}{8} > \frac{9}{8}$ )  | 1     |
| 7  | (a)  | $\frac{1}{2}$ (or $\frac{3}{6}$ )                                          | 1     |
| 7  | (b)  | $1\frac{5}{8}$                                                             | 1     |
| 8  | (a)  | $\frac{1}{2}$ and 0.5                                                      | 1     |
| 8  | (b)  | 0.6 (0.6 = 60%, and 60% > 55%)                                             | 1     |
| 9  | (a)  | $500 + 300$ ; about 800                                                    | 1     |
| 9  | (b)  | No — 7 990 is about ten times the estimate                                 | 1     |
| 10 | (a)  | $24 \times 3 = \square$                                                    | 1     |
| 10 | (b)  | Yes — \$72 is less than \$100, with \$28 to spare                          | 1     |
| 11 | (a)  | $7 \times 6 = 42, 42 \div 6 = 7, 42 \div 7 = 6$                            | 1     |
| 11 | (b)  | 12, via $20 \times \square = 240$                                          | 1     |
| 12 | (a)  | $\square = 7; \square = 36$                                                | 1     |
| 12 | (b)  | True — both sides equal 5                                                  | 1     |
| 13 | (a)  | m; g; L; km                                                                | 1     |
| 13 | (b)  | 1 m 47 cm                                                                  | 1     |
| 14 | (a)  | 16 cm                                                                      | 1     |
| 14 | (b)  | 7 cm <sup>2</sup>                                                          | 1     |

| Q  | Part | Answer                                                                                                 | Marks |
|----|------|--------------------------------------------------------------------------------------------------------|-------|
| 15 | (a)  | 07:20; 15:45                                                                                           | 1     |
| 15 | (b)  | 12:15 am; 9:05 pm                                                                                      | 1     |
| 16 | (a)  | Estimate about $45^\circ$ ;<br>measure $47^\circ$                                                      | 1     |
| 16 | (b)  | $215^\circ$ , using $360^\circ - 145^\circ$                                                            | 1     |
| 16 | (c)  | Constructed $70^\circ$ angle;<br>acute                                                                 | 1     |
| 17 | (a)  | A                                                                                                      | 1     |
| 17 | (b)  | C has 5 squares; a cube<br>has 6 faces                                                                 | 1     |
| 18 | (a)  | B (7, 4); E (0, 0)                                                                                     | 1     |
| 18 | (b)  | (4, 3)                                                                                                 | 1     |
| 19 | (a)  | Translation; reflection                                                                                | 1     |
| 19 | (b)  | Position and orientation<br>change; shape and size<br>stay the same                                    | 1     |
| 20 | (a)  | Nominal categorical;<br>ordinal categorical;<br>discrete numerical                                     | 1     |
| 20 | (b)  | Apple and banana — two<br>modes                                                                        | 1     |
| 21 | (a)  | $42.9^\circ\text{C}$                                                                                   | 1     |
| 21 | (b)  | Fell from $42.9^\circ\text{C}$ to $19.1^\circ\text{C}$ — a drop of $23.8^\circ\text{C}$ in<br>two days | 1     |
| 21 | (c)  | $19.1^\circ\text{C}$ on 11 January                                                                     | 1     |
| 22 | (a)  | Question B                                                                                             | 1     |
| 22 | (b)  | A pushes an opinion and is<br>not objective                                                            | 1     |
| 23 | (a)  | Red or blue; not equally<br>likely — 3 reds, 1 blue                                                    | 1     |
| 23 | (b)  | Fair — each player wins<br>on 3 of the 6 equally likely<br>outcomes                                    | 1     |
| 24 | (a)  | 12 out of 20; $\frac{12}{20}$ (or $\frac{3}{5}$ )                                                      | 1     |
| 24 | (b)  | Red most frequent; red<br>seems most likely                                                            | 1     |

## Worked solutions

**Q1.** (a) Find the factor pairs of 18 in order:  $1 \times 18 = 18$ ,  $2 \times 9 = 18$ ,  $3 \times 6 = 18$ . The next factor to try is 4, and 4 does not split 18 exactly, and 6 has already appeared — so the list is complete.  $\therefore 1 \times 18, 2 \times 9, 3 \times 6$ .

(b) Multiples of 6: 6, 12, 18, 24, 30, ... Multiples of 8: 8, 16, 24, 32, ... The first number in both lists is 24.  $\therefore$  The lowest common multiple of 6 and 8 is **24**.

**Q2.** Place-value partitioning splits 43 into 40 and 3:

| Working                 | Comment                                          |
|-------------------------|--------------------------------------------------|
| $26 \times 40 = 1\ 040$ | $26 \times 4 = 104$ , so $26 \times 40 = 1\ 040$ |
| $26 \times 3 = 78$      | the 3 part                                       |
| $1\ 040 + 78 = 1\ 118$  | add the parts                                    |

$\therefore 26 \times 43 = 1\ 118$ .

Doubling also works neatly:  $26 = 2 \times 13$ , so  $26 \times 43 = 13 \times 86 = 1\ 118$ ; and the standard algorithm earns full marks too. Award the strategy mark for any efficient method shown in the working.

**Q3.** (a)  $6 \times 13 = 78$ , and  $79 - 78 = 1$ .  $\therefore 79 \div 6 = 13$  **remainder 1** (1C: the remainder keeps the leftover amount as a whole number).

(b) 13 tents hold 78 students, and 1 student is left over — that student still needs a tent, so the remainder rounds **up** here.  $\therefore 14$  **tents** (1C: the context decides what the remainder means).

**Q4.** (a) Start at 48 and apply Step 2:

| Number | Decision    | New number |
|--------|-------------|------------|
| 48     | even, halve | 24         |
| 24     | even, halve | 12         |
| 12     | even, halve | 6          |
| 6      | even, halve | 3          |
| 3      | odd, add 1  | 4          |
| 4      | even, halve | 2          |
| 2      | even, halve | 1 — stop   |

$\therefore$  The algorithm makes **48, 24, 12, 6, 3, 4, 2, 1**.

(b) Count the decisions in the table: 7 rows.  $\therefore$  Step 2 was repeated **7 times**. The algorithm **branches** at the even/odd decision and **repeats** Step 2 until it reaches 1.

**Q5.** (a) In 4.275 the first place after the point is tenths, the second is hundredths, the third is thousandths. The 7 sits in the hundredths place.  $\therefore$  The value of the 7 is **7 hundredths**, or **0.07**.

(b) Line the decimals up by place: 1.708, 1.780, 1.078. Compare from the left: the ones are all 1; in the tenths,  $0 < 7$ , so 1.078 is smallest; then compare the hundredths of the other two,  $7 < 8$ .  $\therefore$  **1.078, 1.708, 1.78** — 1.78 means 1.780, which is more than 1.708, because 8 hundredths is more than 0 hundredths and 8 thousandths.

**Q6.** (a) Rename with the common denominator 8, since 4 and 8 are related:  $\frac{3}{4} = \frac{6}{8}$ . Now compare the top numbers:  $5$

$< 6 < 7$ .  $\therefore \frac{5}{8}, \frac{3}{4}, \frac{7}{8}$ .

(b) Rename both as eighths:  $1\frac{1}{4} = 1\frac{2}{8}$  and  $\frac{9}{8} = 1\frac{1}{8}$ . Since  $\frac{2}{8} > \frac{1}{8}$ ,  $\therefore 1\frac{1}{4}$  **is larger** than  $\frac{9}{8}$ .

**Q7.** (a) Rename  $\frac{1}{3}$  as sixths:  $\frac{1}{3} = \frac{2}{6}$ .

$\frac{5}{6} - \frac{1}{3} = \frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$ .  $\therefore \frac{1}{2}$  (accept  $\frac{3}{6}$ ).

(b) Rename the quarters as eighths:  $\frac{1}{4} = \frac{2}{8}$ , so  $1\frac{1}{4} = 1\frac{2}{8}$ .

$$1\frac{2}{8} + \frac{3}{8} = 1\frac{5}{8}. \therefore 1\frac{5}{8}.$$

**Q8.** (a) 50% means 50 out of 100, which is half of the whole.  $\therefore 50\% = \frac{1}{2}$  (or  $\frac{50}{100}$ ) = **0.5**.

(b) Write both the same way:  $0.6 = 0.60 = 60\%$ . Since  $60\% > 55\%$ ,  $\therefore$  **0.6 is larger**. (Or:  $55\% = 0.55$ , and  $0.6 > 0.55$ .)

**Q9.** (a) 487 rounds to 500 and 312 rounds to 300.  $500 + 300 = 800$ .  $\therefore 487 + 312$  is **about 800**.

(b) The estimate is about 800, and 7 990 is about ten times that — far too big to be a sum of two 3-digit numbers in the hundreds.  $\therefore$  **No, 7 990 is not reasonable**; Priya should check her working. (The exact answer is 799, right beside the estimate.)

**Q10.** (a) The total cost is 24 packs at \$3 each, so the parts are equal: multiply.  $\therefore 24 \times 3 = \square$  (formulate).

(b)  $24 \times 3 = 72$ , so the prizes cost \$72. \$72 is less than \$100:  $100 - 72 = 28$ .  $\therefore$  **Yes, the class has enough money — \$28 to spare** (interpret: the answer is said in terms of the money, not just “72”).

**Q11.** (a) Multiplication and division are inverse operations: the same three numbers make two multiplications and two divisions.  $\therefore 7 \times 6 = 42$ ,  $42 \div 6 = 7$ ,  $42 \div 7 = 6$ .

(b) Division can be thought as a missing multiplication:  $240 \div 20$  asks  $20 \times \square = 240$ . Since  $2 \times 12 = 24$ ,  $20 \times 12 = 240$ .  $\therefore 240 \div 20 = 12$ .

**Q12.** (a) (i)  $8 \times 7 = 56$ , so  $\square = 7$ . (ii)  $\square \div 4 = 9$  means  $\square = 9 \times 4 = 36$ , so  $\square = 36$ .

(b) Work out both sides:  $15 \div 3 = 5$  and  $30 \div 6 = 5$ . Both sides name the same number, so  $\therefore$  **true** — the equals sign says the two sides are the same amount, not “the answer comes next”.

**Q13.** (a) Match the unit to the size: a classroom is several **m** long; a banana is about 150 **g**; a bath holds well over 100 **L**; the distance from Melbourne to Ballarat is over 100 **km**.  $\therefore$  m, g, L, km.

(b) 100 cm is 1 m, and 147 cm is 100 cm and 47 cm.  $\therefore$  **1 m 47 cm** — a jump recorded in two units is a more accurate measure than “about a metre and a half”.

**Q14.** (a) Walk around the boundary once and add every side:  $5 + 1 + 2 + 2 + 1 + 2 + 2 + 1 = 16$ .  $\therefore$  The perimeter is **16 cm**.

(b) Count the 1 cm<sup>2</sup> squares: 5 in the top row and 2 in the stem,  $5 + 2 = 7$ .  $\therefore$  The area is **7 cm<sup>2</sup>**.

**Q15.** (a) Morning times keep their hour and gain a leading zero: 7:20 am = **07:20**. Afternoon and evening times add 12 to the hour:  $3 + 12 = 15$ , so 3:45 pm = **15:45**.

(b) 00:15 sits just after midnight, where the day starts: **12:15 am**. 21:05 is 12 hours and 5 minutes past noon:  $21 - 12 = 9$ , so **9:05 pm**.

**Q16.** (a) Angle a looks about half a right angle, so estimate about 45°. Protractor centre on the vertex, baseline along one arm, read the scale that starts at 0 on that arm: **47°** — close to the estimate.  $\therefore a = 47^\circ$ , an acute angle.

(b) The small turn between d’s two arms measures 145°. A full turn is 360°, and  $360^\circ - 145^\circ = 215^\circ$ , so the reflex angle is the big turn around the other way.  $\therefore d = 215^\circ$ .

(c) Rule a base line; protractor centre on the vertex, baseline on the line; mark 70 on the scale that starts at 0; join vertex to mark. Check against the estimate: 70° is a bit smaller than a right angle.  $\therefore 70^\circ$  is an **acute** angle.

**Q17.** (a) A cube has 6 square faces, so its net is 6 squares that fold without overlaps. A is 6 squares in a cross, and it folds into a cube (B folds its squares on top of each other, and D has too many).  $\therefore$  **A**.

(b) C is made of only 5 squares, and a cube has 6 faces — one face would be missing.  $\therefore$  C cannot fold into a cube.

**Q18.** (a) From each point, go across to the horizontal axis and up to the vertical axis, and write the horizontal coordinate first.  $\therefore B = (7, 4)$  and  $E = (0, 0)$  —  $E$  is the origin.

(b) Starting at  $(1, 1)$ : 3 squares to the right adds 3 to the horizontal coordinate,  $1 + 3 = 4$ ; 2 squares up adds 2 to the vertical coordinate,  $1 + 2 = 3$ .  $\therefore$  The new position is  **$(4, 3)$** .

**Q19.** (a) A slide without turning or flipping is a **translation**; a flip over a mirror line is a **reflection**.

(b) A rotation moves the shape to a new position and turns it to a new orientation, but the image is the same shape and the same size as the original.  $\therefore$  **Position and orientation change; shape and size stay the same.**

**Q20.** (a) Favourite sport is a name with no order: **nominal categorical**. A 1-to-5-star rating is a category with an order, even though it looks like a number: **ordinal categorical**. The number of people in a home is a count: **discrete numerical**.

(b) Count each fruit: apple appears 3 times, banana appears 3 times, orange appears once. The highest frequency is 3, and two values share it.  $\therefore$  The mode is **apple and banana** — a data set can have two modes.

**Q21.** (a) Find 9 January on the horizontal axis, go up to the point, then across to the vertical axis.  $\therefore$  The maximum temperature on 9 January was  **$42.9^\circ\text{C}$** .

(b) Read the two points:  $42.9^\circ\text{C}$  on 9 January and  $19.1^\circ\text{C}$  on 11 January;  $42.9 - 19.1 = 23.8$ .  $\therefore$  “*The maximum temperature fell from  $42.9^\circ\text{C}$  on 9 January to  $19.1^\circ\text{C}$  on 11 January — a drop of  $23.8^\circ\text{C}$  in just two days.*”

(c) The lowest point on the line is marked.  $\therefore$  The coolest maximum temperature was  **$19.1^\circ\text{C}$  on 11 January**. (January is summer in Melbourne, and even the coolest day’s maximum stayed above  $19^\circ\text{C}$ .)

**Q22.** (a) Question B asks for a fact and offers a balanced set of answer choices.  $\therefore$  **Question B**.

(b) Question A tells you what to think before you answer — “don’t you think?” pushes people towards “yes”. A survey question must be objective and free of opinion, or the data it collects is not fair.  $\therefore$  Question A is leading, so it will not collect fair data.

**Q23.** (a) The counter drawn can only be red or blue: those are the two possible outcomes. There are 3 red counters and only 1 blue, so the outcomes are **not equally likely** — red is more likely.  $\therefore$  Outcomes: red or blue; not equally likely.

(b) A fair die has 6 equally likely outcomes. Player 1 wins on 3 of them (1, 2, 3) and player 2 wins on 3 of them (4, 5, 6) — the same number each.  $\therefore$  **Yes, the game is fair.**

**Q24.** (a) Red happened 12 times out of the 20 spins.  $\therefore$  The frequency of red is **12 out of 20**, or  $\frac{12}{20}$  (which simplifies to  $\frac{3}{5}$ ).

(b) Red has the highest frequency (12, against 5 and 3). In these trials, the outcome that happened most often is the one that seems most likely.  $\therefore$  **Red** was most frequent, and **red** seems most likely.