THE COMMISSION VOLUME 3

The Build. Volume 1 laid out the work, Volume 2 found what the first pass missed. Volume 3 is the part where everything has to work together at once.

Why there is a Volume 3

Not because more practice is always better. Because an audit of Volumes 1 and 2 found three specific things wrong with them.

What the audit found	What Volume 3 does
Four expectations were never covered at all	C1.2 translating a pattern into a table of values and a graph · C1.4 patterns showing number relationships · E2.5 **nets** · F1.3 factors that help or interfere with a financial goal. Two more were thin: B2.9 and F1.5.
Thinking questions were only 17% of the total	EQAO maps questions to three categories, and Thinking means "select and sequence a variety of tools". Volume 3 is **67% Thinking** — multi-step, two-strand problems where you have to decide what to do before you can do it.
Almost every question was single-select	98.6% of Volumes 1 and 2 was choose-one. The real assessment leans on **choose-all-that-apply** and **ordering**. Students were meeting those formats for the first time on the day.

This volume is harder, on purpose. If Volumes 1 and 2 went well, that is exactly why this one exists. A student who can do every single-step question and still stalls on the assessment is stalling on the multi-step ones — and those are what is in here.

Designer

Keep the formula sheet and glossary beside you. Both are free from eqao.com and students get them on the day. Volume 3 assumes you are using them.

FOR THE TEACHER · HOW VOLUME 3 DIFFERS

Four new kinds of question

The content is Grade 6 curriculum throughout. What changes is the *demand*.

Format	What it asks, and why it matters
Spot the mistake Sheets 9–14	A student's work is shown, with a plausible wrong answer. The question is *what went wrong*. This attacks distractor-choosing head on: the released data shows students at Level 2 pick answers that come from doing one correct step and stopping. Naming that error is a different skill from avoiding it, and it transfers.
Two-strand problems Sheets 15–19	Area → cost → discount. Tally → total → probability. Pattern rule → equation → solve. Each needs two or three steps across two strands, which is what the Thinking category actually measures.
Estimation and reasonableness Sheets 20–21	"Without working it out exactly…" and "a student wrote 2.1 km for a door — what should it be?" Checking whether an answer is *sensible* recovers more marks than recalculating does.
Working backwards Sheet 22	Given the area and the height, find the base. Given that 25% is 20, find the whole. Same formulas, run in reverse.

How to use it

Do not start here. Volume 3 assumes the single-step work is secure. A student who is still shaky on B2.5 or E2.4 should be in Volume 1 or 2, not here.

Spot-the-mistake sheets work best out loud, in pairs. The talking is the point. Two students arguing about where the error is will teach each other more than either would get from marking it alone.

Two-strand problems need the step box. Ask "how many steps?" before any working. The answer is almost never one.

What this volume will *not* do. It will not raise a level in three weeks and it is not a set of mock papers to grind. Papers 5 and 6 are at the back; two is deliberately not ten.

Original questions throughout. Blueprint proportions, categories and formats match the published EQAO Junior Division Framework; every question was written for this book.

VOLUME 3 · SHEET 3

Tables Of Values And Graphs

NEW Strand C · Algebra · C1.2

A pattern, a table and a graph are three views of the same thing. Never covered before this volume.

1 A pattern starts at **4** and the rule is **add 2**. Which pair belongs in its table of values? C1.2 · AP

- **A** (12, 26)
- **B** (12, 28)
- **C** (12, 24)
- **D** (26, 12)

2 A pattern starts at **7** and the rule is **add 2**. Which pair belongs in its table of values? C1.2 · AP

- **A** (7, 19)
- **B** (7, 21)
- **C** (7, 14)
- **D** (19, 7)

3 The points **(1, 7) · (2, 10) · (3, 13) · (4, 16)** are plotted on a graph. What does the graph look like? C1.2 · TH

- **A** a straight line going down to the right
- **B** points scattered with no pattern
- **C** a straight line going up to the right
- **D** a curve that gets steeper

4 A table of values pairs term number with term value:
(1, 13) · (2, 20) · (3, 27) · (4, 34)
What is the rule? C1.2 · AP

- **A** add 7 to the term number
- **B** multiply the term number by 7, then add 6
- **C** multiply by 6, then add 7
- **D** multiply the term number by 8

5 The points **(1, 15) · (2, 21) · (3, 27) · (4, 33)** are plotted on a graph. What does the graph look like? C1.2 · TH

- **A** a straight line going down to the right
- **B** points scattered with no pattern
- **C** a curve that gets steeper
- **D** a straight line going up to the right

6 A pattern starts at **14** and the rule is **add 7**. Which pair belongs in its table of values? C1.2 · AP

- **A** (9, 70)
- **B** (70, 9)
- **C** (9, 63)
- **D** (9, 77)

7 A pattern starts at **10** and the rule is **add 3**. Which pair belongs in its table of values? C1.2 · AP

- **A** (6, 28)
- **B** (25, 6)
- **C** (6, 18)
- **D** (6, 25)

8 A pattern starts at **8** and the rule is **add 4**. Which pair belongs in its table of values? C1.2 · AP

- **A** (44, 10)
- **B** (10, 40)
- **C** (10, 48)
- **D** (10, 44)

9 A table of values pairs term number with term value:
(1, 11) · (2, 15) · (3, 19) · (4, 23)
What is the rule? C1.2 · AP

- **A** multiply the term number by 4, then add 7
- **B** multiply the term number by 5
- **C** add 4 to the term number
- **D** multiply by 7, then add 4

10 A pattern starts at **10** and the rule is **add 2**. Which pair belongs in its table of values? C1.2 · AP

- ◯ **A** (30, 11)
- ◯ **B** (11, 22)
- ◯ **C** (11, 32)
- ◯ **D** (11, 30)

11 The points **(1, 10) · (2, 13) · (3, 16) · (4, 19)** are plotted on a graph. What does the graph look like? C1.2 · TH

- ◯ **A** a straight line going up to the right
- ◯ **B** points scattered with no pattern
- ◯ **C** a curve that gets steeper
- ◯ **D** a straight line going down to the right

12 A pattern starts at **13** and the rule is **add 7**. Which pair belongs in its table of values? C1.2 · AP

- ◯ **A** (8, 62)
- ◯ **B** (8, 56)
- ◯ **C** (62, 8)
- ◯ **D** (8, 69)

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 4

Number Relationships In Patterns

NEW Strand C · Algebra · C1.4

Patterns that show how whole numbers and decimals relate — tenfold, halving, equal decimal steps.

1 A pattern: **2.5, 3, 3.5, 4, …** What comes next? C1.4 · AP

- **A** 8
- **B** 5
- **C** 4.5
- **D** 754

2 A pattern: **7, 70, 700, 7000, …** What comes next? C1.4 · AP

- **A** 70000
- **B** 7010
- **C** 35000
- **D** 700000

3 A pattern: **12, 120, 1200, 12000, …** What comes next? C1.4 · AP

- **A** 120000
- **B** 1.2e+06
- **C** 60000
- **D** 12010

4 A pattern: **2.5, 25, 250, 2500, …** What comes next? C1.4 · AP

- **A** 250000
- **B** 25000
- **C** 12500
- **D** 2510

5 A pattern: **0.5, 0.75, 1, 1.25, …** What comes next? C1.4 · AP

- **A** 2.5
- **B** 2.25
- **C** 1.75
- **D** 1.5

6 A pattern: **80, 40, 20, 10, …** What comes next? C1.4 · AP

- **A** 8
- **B** 2.5
- **C** 5
- **D** 20

7 A pattern: **320, 160, 80, 40, …** What comes next? C1.4 · AP

- **A** 80
- **B** 38
- **C** 10
- **D** 20

8 A pattern: **7, 70, 700, 7000, …** What comes next? C1.4 · AP

- **A** 7010
- **B** 700000
- **C** 70000
- **D** 35000

9 A pattern: **0.5, 0.75, 1, 1.25, …** What comes next? C1.4 · AP

- **A** 1.5
- **B** 2.25
- **C** 1.75
- **D** 2.5

10 A pattern: **2.5, 3, 3.5, 4, …** What comes next? C1.4 · AP

- **A** 8
- **B** 704
- **C** 5
- **D** 4.5

11 A pattern: **160, 80, 40, 20, …** What comes next? C1.4 · AP

- **A** 10
- **B** 40
- **C** 18
- **D** 5

12 A pattern: **0.6, 6, 60, 600, …** What comes next? C1.4 · AP

- **A** 3000
- **B** 610
- **C** 60000
- **D** 6000

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VOLUME 3 · SHEET 5

Nets

NEW Strand E · Spatial Sense · E2.5

One shape in the net for every face on the solid. Count them and match.

1 How many shapes are in the net of a **triangular pyramid**? E2.5 · KU

- **A** 4
- **B** 5
- **C** 7
- **D** 6

2 How many shapes are in the net of a **pentagonal prism**? E2.5 · KU

- **A** 4
- **B** 6
- **C** 7
- **D** 5

3 How many shapes are in the net of a **triangular prism**? E2.5 · KU

- **A** 5
- **B** 4
- **C** 7
- **D** 6

4 Which 3-D object folds up from a net made of **two pentagons and five rectangles**? E2.5 · AP

- **A** cube
- **B** pentagonal prism
- **C** triangular prism
- **D** rectangular prism

5 Which 3-D object folds up from a net made of **six squares**? E2.5 · AP

- **A** triangular prism
- **B** square pyramid
- **C** rectangular prism
- **D** cube

6 Which 3-D object folds up from a net made of **two triangles and three rectangles**? E2.5 · AP

- **A** square pyramid
- **B** triangular prism
- **C** rectangular prism
- **D** cube

7 How many shapes are in the net of a **rectangular prism**? E2.5 · KU

- **A** 6
- **B** 7
- **C** 5
- **D** 4

8 Which 3-D object folds up from a net made of **six squares**? E2.5 · AP

- **A** cube
- **B** rectangular prism
- **C** triangular prism
- **D** square pyramid

9 Which 3-D object folds up from a net made of **two pentagons and five rectangles**? E2.5 · AP

- **A** cube
- **B** rectangular prism
- **C** triangular prism
- **D** pentagonal prism

10 Which 3-D object folds up from a net made of **two pentagons and five rectangles**? E2.5 · AP

- **A** triangular prism
- **B** cube
- **C** pentagonal prism
- **D** rectangular prism

11 How many shapes are in the net of a **triangular pyramid**? E2.5 · KU

- **A** 7
- **B** 4
- **C** 6
- **D** 5

12 Which 3-D object folds up from a net made of **two pentagons and five rectangles**? E2.5 · AP

- **A** triangular prism
- **B** cube
- **C** rectangular prism
- **D** pentagonal prism

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VOLUME 3 · SHEET 6

What Helps, What Interferes

NEW Strand F · Financial Literacy · F1.3

Naming the obstacle is the first step to planning round it.

1 Does **tracking every expense for a month first** help or interfere with reaching a financial goal? F1.3 · KU

- **A** it does both equally
- **B** it interferes
- **C** it makes no difference
- **D** it helps

2 Does **setting up an automatic transfer on payday** help or interfere with reaching a financial goal? F1.3 · KU

- **A** it interferes
- **B** it does both equally
- **C** it helps
- **D** it makes no difference

3 Does **having no deadline for the goal** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it helps
- **B** it makes no difference
- **C** it guarantees failure
- **D** it interferes

4 Does **tracking every expense for a month first** help or interfere with reaching a financial goal? F1.3 · KU

- **A** it helps
- **B** it does both equally
- **C** it interferes
- **D** it makes no difference

5 Does **keeping savings in the same account you spend from** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it helps
- **B** it interferes
- **C** it guarantees failure
- **D** it makes no difference

6 Does **setting up an automatic transfer on payday** help or interfere with reaching a financial goal? F1.3 · KU

- **A** it makes no difference
- **B** it interferes
- **C** it does both equally
- **D** it helps

7 Does **asking for the money as a gift instead of something else** help or interfere with reaching a financial goal? F1.3 · KU

- **A** it does both equally
- **B** it helps
- **C** it makes no difference
- **D** it interferes

8 Does **writing the goal down with a date and an amount** help or interfere with reaching a financial goal? F1.3 · KU

- **A** it does both equally
- **B** it interferes
- **C** it makes no difference
- **D** it helps

9 Does **keeping savings in the same account you spend from** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it interferes
- **B** it helps
- **C** it makes no difference
- **D** it guarantees failure

10 Does **having no deadline for the goal** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it makes no difference
- **B** it interferes
- **C** it helps
- **D** it guarantees failure

11 Does **keeping savings in the same account you spend from** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it helps
- **B** it makes no difference
- **C** it interferes
- **D** it guarantees failure

12 Does **keeping the savings in a separate account** help or interfere with reaching a financial goal? F1.3 · KU

- ◯ **A** it makes no difference
- ◯ **B** it does both equally
- ◯ **C** it interferes
- ◯ **D** it helps

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VOLUME 3 · SHEET 7

Fractions Of A Quantity

TOP-UP Strand B · Number · B2.9

Divide by the denominator, then multiply by the numerator.

1 **4/5** of the **25** saplings ordered are maple. How many are maple? B2.9 · AP

- A 20
- B 5
- C 31
- D 269

2 **1/2** of the **32** saplings ordered are maple. How many are maple? B2.9 · AP

- A 30
- B 64
- C 28
- D 16

3 **1/2** of the **50** saplings ordered are maple. How many are maple? B2.9 · AP

- A 48
- B 331
- C 25
- D 100

4 **5/6** of the **48** saplings ordered are maple. How many are maple? B2.9 · AP

- A 8
- B 42
- C 57
- D 40

5 **2/4** of the **32** saplings ordered are maple. How many are maple? B2.9 · AP

- A 16
- B 28
- C 8
- D 64

6 **1/3** of the **36** saplings ordered are maple. How many are maple? B2.9 · AP

- A 33
- B 108
- C 12
- D 943

7 **2/3** of the **45** saplings ordered are maple. How many are maple? B2.9 · AP

- A 67
- B 15
- C 30
- D 42

8 **4/6** of the **21** saplings ordered are maple. How many are maple? B2.9 · AP

- A 14
- B 31
- C 15
- D 3

9 **2/5** of the **45** saplings ordered are maple. How many are maple? B2.9 · AP

- A 40
- B 9
- C 112
- D 18

10 **4/6** of the **51** saplings ordered are maple. How many are maple? B2.9 · AP

- A 34
- B 8
- C 76
- D 45

11 **1/2** of the **20** saplings ordered are maple. How many are maple? B2.9 · AP

- A 18
- B 10
- C 40
- D 176

12 **2/3** of the **21** saplings ordered are maple. How many are maple? B2.9 · AP

- A 7
- B 18
- C 14
- D 31

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VOLUME 3 · SHEET 8

Trading, Lending, Borrowing, Donating

TOP-UP Strand F · Financial Literacy · F1.5

Four ways things move between people. They differ in who owes whom afterwards.

1 **You give a friend your spare bike and they give you their skateboard.** What is this? F1.5 · KU

- A borrowing
- B trading
- C donating
- D lending

2 **You take $20 from a friend and agree to pay it back.** What is this? F1.5 · KU

- A borrowing
- B lending
- C donating
- D trading

3 **You swap two of your cards for one of theirs.** What is this? F1.5 · KU

- A lending
- B borrowing
- C trading
- D donating

4 **You take $20 from a friend and agree to pay it back.** What is this? F1.5 · KU

- A borrowing
- B lending
- C trading
- D donating

5 **You give $20 to a food bank.** What is this? F1.5 · KU

- A donating
- B lending
- C borrowing
- D trading

6 **You give a friend your spare bike and they give you their skateboard.** What is this? F1.5 · KU

- A trading
- B donating
- C lending
- D borrowing

7 **You take $20 from a friend and agree to pay it back.** What is this? F1.5 · KU

- A donating
- B trading
- C lending
- D borrowing

8 **You give a friend your spare bike and they give you their skateboard.** What is this? F1.5 · KU

- A trading
- B lending
- C borrowing
- D donating

9 **You give a friend $20 and they agree to pay it back next month.** What is this? F1.5 · KU

- A lending
- B borrowing
- C donating
- D trading

10 **You swap two of your cards for one of theirs.** What is this? F1.5 · KU

- A borrowing
- B donating
- C lending
- D trading

11 **You take $20 from a friend and agree to pay it back.** What is this? F1.5 · KU

- A borrowing
- B lending
- C trading
- D donating

12 **You take $20 from a friend and agree to pay it back.** What is this? F1.5 · KU

- A trading
- B donating
- C borrowing
- D lending

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VOLUME 3 · SHEET 9

Spot The Mistake — Fractions

ERROR Strand B · Number · B2.5

Someone added the denominators. Say exactly what they did wrong.

1 A student worked out **4/5 + 2/3 = 6/8**.
What did they do wrong? B2.5 · TH

- **A** They added the numerators instead of multiplying them
- **B** They used the wrong common denominator
- **C** They forgot to simplify the answer
- **D** They added the denominators instead of finding a common denominator

2 A student worked out **2/3 + 4/5 = 6/8**.
What did they do wrong? B2.5 · TH

- **A** They added the numerators instead of multiplying them
- **B** They used the wrong common denominator
- **C** They added the denominators instead of finding a common denominator
- **D** They forgot to simplify the answer

3 A student worked out **5/6 + 1/4 = 6/10**.
What did they do wrong? B2.5 · TH

- **A** They added the numerators instead of multiplying them
- **B** They used the wrong common denominator
- **C** They forgot to simplify the answer
- **D** They added the denominators instead of finding a common denominator

4 A student worked out **2/3 + 2/4 = 4/7**.
What did they do wrong? B2.5 · TH

- **A** They added the numerators instead of multiplying them
- **B** They used the wrong common denominator
- **C** They added the denominators instead of finding a common denominator
- **D** They forgot to simplify the answer

5 A student worked out **1/4 + 1/2 = 2/6**.
What did they do wrong? B2.5 · TH

- **A** They added the denominators instead of finding a common denominator
- **B** They added the numerators instead of multiplying them
- **C** They forgot to simplify the answer
- **D** They used the wrong common denominator

6 A student worked out **3/6 + 2/4 = 5/10**.
What did they do wrong? B2.5 · TH

- **A** They added the numerators instead of multiplying them
- **B** They forgot to simplify the answer
- **C** They used the wrong common denominator
- **D** They added the denominators instead of finding a common denominator

7 A student worked out **1/4 + 6/8 = 7/12**.
What did they do wrong? B2.5 · TH

- ◯ **A** They added the denominators instead of finding a common denominator
- ◯ **B** They used the wrong common denominator
- ◯ **C** They forgot to simplify the answer
- ◯ **D** They added the numerators instead of multiplying them

8 A student worked out **3/4 + 1/2 = 4/6**.
What did they do wrong? B2.5 · TH

- ◯ **A** They added the denominators instead of finding a common denominator
- ◯ **B** They added the numerators instead of multiplying them
- ◯ **C** They forgot to simplify the answer
- ◯ **D** They used the wrong common denominator

9 A student worked out **2/8 + 1/6 = 3/14**.
What did they do wrong? B2.5 · TH

- ◯ **A** They added the numerators instead of multiplying them
- ◯ **B** They used the wrong common denominator
- ◯ **C** They forgot to simplify the answer
- ◯ **D** They added the denominators instead of finding a common denominator

10 A student worked out **1/2 + 1/3 = 2/5**.
What did they do wrong? B2.5 · TH

- ◯ **A** They added the denominators instead of finding a common denominator
- ◯ **B** They added the numerators instead of multiplying them
- ◯ **C** They forgot to simplify the answer
- ◯ **D** They used the wrong common denominator

11 A student worked out **1/3 + 1/2 = 2/5**.
What did they do wrong? B2.5 · TH

- ◯ **A** They forgot to simplify the answer
- ◯ **B** They used the wrong common denominator
- ◯ **C** They added the denominators instead of finding a common denominator
- ◯ **D** They added the numerators instead of multiplying them

12 A student worked out **2/4 + 2/3 = 4/7**.
What did they do wrong? B2.5 · TH

- ◯ **A** They forgot to simplify the answer
- ◯ **B** They added the numerators instead of multiplying them
- ◯ **C** They used the wrong common denominator
- ◯ **D** They added the denominators instead of finding a common denominator

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VOLUME 3 · SHEET 10

Spot The Mistake — Area

ERROR Strand E · Spatial Sense · E2.4

The slant side, or the missing ÷ 2. Both are classics.

1 A parallelogram has base **12 cm**, slanted side **10 cm** and perpendicular height **8 cm**. A student wrote **Area = 12 × 10 = 120 cm²**.
What went wrong? E2.4 · TH

- **A** They used the wrong units
- **B** They forgot to divide by 2
- **C** They used the slanted side instead of the perpendicular height
- **D** They multiplied instead of adding

2 A triangle has base **16 cm** and height **10 cm**. A student wrote **Area = 16 × 10 = 160 cm²**.
What went wrong? E2.4 · TH

- **A** They used the wrong height
- **B** They forgot to divide by 2
- **C** They used square units by mistake
- **D** They should have added the base and height

3 A parallelogram has base **10 cm**, slanted side **8 cm** and perpendicular height **6 cm**. A student wrote **Area = 10 × 8 = 80 cm²**.
What went wrong? E2.4 · TH

- **A** They used the slanted side instead of the perpendicular height
- **B** They forgot to divide by 2
- **C** They multiplied instead of adding
- **D** They used the wrong units

4 A parallelogram has base **10 cm**, slanted side **8 cm** and perpendicular height **6 cm**. A student wrote **Area = 10 × 8 = 80 cm²**.
What went wrong? E2.4 · TH

- **A** They forgot to divide by 2
- **B** They used the slanted side instead of the perpendicular height
- **C** They used the wrong units
- **D** They multiplied instead of adding

5 A parallelogram has base **16 cm**, slanted side **13 cm** and perpendicular height **10 cm**. A student wrote **Area = 16 × 13 = 208 cm²**.
What went wrong? E2.4 · TH

- **A** They used the wrong units
- **B** They multiplied instead of adding
- **C** They used the slanted side instead of the perpendicular height
- **D** They forgot to divide by 2

6 A parallelogram has base **10 cm**, slanted side **8 cm** and perpendicular height **6 cm**. A student wrote **Area = 10 × 8 = 80 cm²**.
What went wrong? E2.4 · TH

- **A** They forgot to divide by 2
- **B** They multiplied instead of adding
- **C** They used the slanted side instead of the perpendicular height
- **D** They used the wrong units

7 A triangle has base **16 cm** and height **10 cm**. A student wrote **Area = 16 × 10 = 160 cm²**.
What went wrong? E2.4 · TH

- ◯ **A** They forgot to divide by 2
- ◯ **B** They used the wrong height
- ◯ **C** They used square units by mistake
- ◯ **D** They should have added the base and height

8 A parallelogram has base **16 cm**, slanted side **13 cm** and perpendicular height **10 cm**. A student wrote **Area = 16 × 13 = 208 cm²**.
What went wrong? E2.4 · TH

- ◯ **A** They used the wrong units
- ◯ **B** They multiplied instead of adding
- ◯ **C** They used the slanted side instead of the perpendicular height
- ◯ **D** They forgot to divide by 2

9 A parallelogram has base **10 cm**, slanted side **8 cm** and perpendicular height **6 cm**. A student wrote **Area = 10 × 8 = 80 cm²**.
What went wrong? E2.4 · TH

- ◯ **A** They multiplied instead of adding
- ◯ **B** They used the slanted side instead of the perpendicular height
- ◯ **C** They used the wrong units
- ◯ **D** They forgot to divide by 2

10 A parallelogram has base **10 cm**, slanted side **8 cm** and perpendicular height **6 cm**. A student wrote **Area = 10 × 8 = 80 cm²**.
What went wrong? E2.4 · TH

- ◯ **A** They forgot to divide by 2
- ◯ **B** They multiplied instead of adding
- ◯ **C** They used the wrong units
- ◯ **D** They used the slanted side instead of the perpendicular height

11 A parallelogram has base **10 cm**, slanted side **8 cm** and perpendicular height **6 cm**. A student wrote **Area = 10 × 8 = 80 cm²**.
What went wrong? E2.4 · TH

- ◯ **A** They used the wrong units
- ◯ **B** They multiplied instead of adding
- ◯ **C** They used the slanted side instead of the perpendicular height
- ◯ **D** They forgot to divide by 2

12 A triangle has base **12 cm** and height **8 cm**. A student wrote **Area = 12 × 8 = 96 cm²**.
What went wrong? E2.4 · TH

- ◯ **A** They used the wrong height
- ◯ **B** They used square units by mistake
- ◯ **C** They forgot to divide by 2
- ◯ **D** They should have added the base and height

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 11

Spot The Mistake — Order Of Operations

ERROR Strand B · Number · B2.1

Multiplication before addition. Every time.

1 A student worked out **3 + 3 × 2** and got **12**.
What did they do wrong? B2.1 · TH

- ○ **A** They used the wrong numbers
- ○ **B** They multiplied before adding
- ○ **C** They added before multiplying
- ○ **D** They forgot the brackets in the question

2 A student worked out **8 + 4 × 7** and got **84**.
What did they do wrong? B2.1 · TH

- ○ **A** They used the wrong numbers
- ○ **B** They multiplied before adding
- ○ **C** They forgot the brackets in the question
- ○ **D** They added before multiplying

3 A student worked out **4 + 8 × 7** and got **84**.
What did they do wrong? B2.1 · TH

- ○ **A** They multiplied before adding
- ○ **B** They used the wrong numbers
- ○ **C** They added before multiplying
- ○ **D** They forgot the brackets in the question

4 A student worked out **8 + 2 × 4** and got **40**.
What did they do wrong? B2.1 · TH

- ○ **A** They used the wrong numbers
- ○ **B** They added before multiplying
- ○ **C** They forgot the brackets in the question
- ○ **D** They multiplied before adding

5 A student worked out **7 + 4 × 7** and got **77**.
What did they do wrong? B2.1 · TH

- ○ **A** They added before multiplying
- ○ **B** They forgot the brackets in the question
- ○ **C** They used the wrong numbers
- ○ **D** They multiplied before adding

6 A student worked out **3 + 5 × 5** and got **40**.
What did they do wrong? B2.1 · TH

- ○ **A** They forgot the brackets in the question
- ○ **B** They added before multiplying
- ○ **C** They multiplied before adding
- ○ **D** They used the wrong numbers

7 A student worked out **6 + 7 × 5** and got **65**.
What did they do wrong? B2.1 · TH

- ○ **A** They added before multiplying
- ○ **B** They multiplied before adding
- ○ **C** They forgot the brackets in the question
- ○ **D** They used the wrong numbers

8 A student worked out **2 + 8 × 5** and got **50**.
What did they do wrong? B2.1 · TH

- ○ **A** They used the wrong numbers
- ○ **B** They added before multiplying
- ○ **C** They multiplied before adding
- ○ **D** They forgot the brackets in the question

9 A student worked out **7 + 9 × 4** and got **64**.
What did they do wrong? B2.1 · TH

- ○ **A** They forgot the brackets in the question
- ○ **B** They added before multiplying
- ○ **C** They used the wrong numbers
- ○ **D** They multiplied before adding

10 A student worked out **6 + 4 × 9** and got **90**.
What did they do wrong? B2.1 · TH

- ○ **A** They added before multiplying
- ○ **B** They multiplied before adding
- ○ **C** They forgot the brackets in the question
- ○ **D** They used the wrong numbers

11 A student worked out **8 + 3 × 4** and got **44**.
What did they do wrong? B2.1 · TH

- ○ **A** They added before multiplying
- ○ **B** They forgot the brackets in the question
- ○ **C** They multiplied before adding
- ○ **D** They used the wrong numbers

12 A student worked out **5 + 6 × 2** and got **22**.
What did they do wrong? B2.1 · TH

- ○ **A** They added before multiplying
- ○ **B** They used the wrong numbers
- ○ **C** They forgot the brackets in the question
- ○ **D** They multiplied before adding

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 12

Spot The Mistake — Patterns

ERROR Strand C · Algebra · C1.3

The rule applied once instead of every time. The commonest pattern error there is.

1 A pattern starts at **12** with the rule **add 7**. Asked for the **5th** term, a student wrote **19**. What did they do wrong? C1.3 · TH

- **A** They subtracted instead of adding
- **B** They applied the rule 5 times instead of 4
- **C** They used the wrong starting number
- **D** They applied the rule once instead of 4 times

2 A pattern starts at **11** with the rule **add 6**. Asked for the **5th** term, a student wrote **17**. What did they do wrong? C1.3 · TH

- **A** They used the wrong starting number
- **B** They subtracted instead of adding
- **C** They applied the rule 5 times instead of 4
- **D** They applied the rule once instead of 4 times

3 A pattern starts at **4** with the rule **add 7**. Asked for the **5th** term, a student wrote **11**. What did they do wrong? C1.3 · TH

- **A** They subtracted instead of adding
- **B** They applied the rule once instead of 4 times
- **C** They applied the rule 5 times instead of 4
- **D** They used the wrong starting number

4 A pattern starts at **10** with the rule **add 4**. Asked for the **5th** term, a student wrote **14**. What did they do wrong? C1.3 · TH

- **A** They applied the rule 5 times instead of 4
- **B** They subtracted instead of adding
- **C** They applied the rule once instead of 4 times
- **D** They used the wrong starting number

5 A pattern starts at **3** with the rule **add 6**. Asked for the **5th** term, a student wrote **9**. What did they do wrong? C1.3 · TH

- **A** They applied the rule 5 times instead of 4
- **B** They applied the rule once instead of 4 times
- **C** They subtracted instead of adding
- **D** They used the wrong starting number

6 A pattern starts at **4** with the rule **add 7**. Asked for the **5th** term, a student wrote **11**. What did they do wrong? C1.3 · TH

- **A** They applied the rule 5 times instead of 4
- **B** They applied the rule once instead of 4 times
- **C** They subtracted instead of adding
- **D** They used the wrong starting number

7 A pattern starts at **10** with the rule **add 4**. Asked for the **5th** term, a student wrote **14**. What did they do wrong? C1.3 · TH

- ○ **A** They used the wrong starting number
- ○ **B** They applied the rule once instead of 4 times
- ○ **C** They subtracted instead of adding
- ○ **D** They applied the rule 5 times instead of 4

8 A pattern starts at **11** with the rule **add 5**. Asked for the **5th** term, a student wrote **16**. What did they do wrong? C1.3 · TH

- ○ **A** They applied the rule once instead of 4 times
- ○ **B** They used the wrong starting number
- ○ **C** They applied the rule 5 times instead of 4
- ○ **D** They subtracted instead of adding

9 A pattern starts at **6** with the rule **add 6**. Asked for the **5th** term, a student wrote **12**. What did they do wrong? C1.3 · TH

- ○ **A** They applied the rule 5 times instead of 4
- ○ **B** They applied the rule once instead of 4 times
- ○ **C** They used the wrong starting number
- ○ **D** They subtracted instead of adding

10 A pattern starts at **8** with the rule **add 4**. Asked for the **5th** term, a student wrote **12**. What did they do wrong? C1.3 · TH

- ○ **A** They used the wrong starting number
- ○ **B** They applied the rule once instead of 4 times
- ○ **C** They subtracted instead of adding
- ○ **D** They applied the rule 5 times instead of 4

11 A pattern starts at **4** with the rule **add 6**. Asked for the **5th** term, a student wrote **10**. What did they do wrong? C1.3 · TH

- ○ **A** They subtracted instead of adding
- ○ **B** They applied the rule 5 times instead of 4
- ○ **C** They applied the rule once instead of 4 times
- ○ **D** They used the wrong starting number

12 A pattern starts at **11** with the rule **add 7**. Asked for the **5th** term, a student wrote **18**. What did they do wrong? C1.3 · TH

- ○ **A** They used the wrong starting number
- ○ **B** They applied the rule once instead of 4 times
- ○ **C** They subtracted instead of adding
- ○ **D** They applied the rule 5 times instead of 4

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 13

Spot The Mistake — Percentages

ERROR Strand F · Financial Literacy · F1.1

They gave the discount instead of the price. Read what was actually asked.

1 A jacket costs **$80** with **10% off**. A student answered **$8**.
What did they do wrong? F1.1 · TH

- **A** They added the discount instead of subtracting
- **B** They worked out 10% wrongly
- **C** They used the wrong percentage
- **D** They gave the discount instead of the sale price

2 A jacket costs **$40** with **10% off**. A student answered **$4**.
What did they do wrong? F1.1 · TH

- **A** They worked out 10% wrongly
- **B** They added the discount instead of subtracting
- **C** They used the wrong percentage
- **D** They gave the discount instead of the sale price

3 A jacket costs **$200** with **10% off**. A student answered **$20**.
What did they do wrong? F1.1 · TH

- **A** They used the wrong percentage
- **B** They gave the discount instead of the sale price
- **C** They added the discount instead of subtracting
- **D** They worked out 10% wrongly

4 A jacket costs **$120** with **50% off**. A student answered **$60**.
What did they do wrong? F1.1 · TH

- **A** They added the discount instead of subtracting
- **B** They gave the discount instead of the sale price
- **C** They worked out 50% wrongly
- **D** They used the wrong percentage

5 A jacket costs **$60** with **20% off**. A student answered **$12**.
What did they do wrong? F1.1 · TH

- **A** They added the discount instead of subtracting
- **B** They gave the discount instead of the sale price
- **C** They used the wrong percentage
- **D** They worked out 20% wrongly

6 A jacket costs **$200** with **50% off**. A student answered **$100**.
What did they do wrong? F1.1 · TH

- **A** They used the wrong percentage
- **B** They worked out 50% wrongly
- **C** They gave the discount instead of the sale price
- **D** They added the discount instead of subtracting

7 A jacket costs **$200** with **50% off**. A student answered **$100**. What did they do wrong? F1.1 · TH

- ○ **A** They worked out 50% wrongly
- ○ **B** They gave the discount instead of the sale price
- ○ **C** They added the discount instead of subtracting
- ○ **D** They used the wrong percentage

8 A jacket costs **$200** with **50% off**. A student answered **$100**. What did they do wrong? F1.1 · TH

- ○ **A** They worked out 50% wrongly
- ○ **B** They used the wrong percentage
- ○ **C** They added the discount instead of subtracting
- ○ **D** They gave the discount instead of the sale price

9 A jacket costs **$120** with **20% off**. A student answered **$24**. What did they do wrong? F1.1 · TH

- ○ **A** They added the discount instead of subtracting
- ○ **B** They gave the discount instead of the sale price
- ○ **C** They worked out 20% wrongly
- ○ **D** They used the wrong percentage

10 A jacket costs **$80** with **10% off**. A student answered **$8**. What did they do wrong? F1.1 · TH

- ○ **A** They gave the discount instead of the sale price
- ○ **B** They added the discount instead of subtracting
- ○ **C** They used the wrong percentage
- ○ **D** They worked out 10% wrongly

11 A jacket costs **$200** with **50% off**. A student answered **$100**. What did they do wrong? F1.1 · TH

- ○ **A** They added the discount instead of subtracting
- ○ **B** They gave the discount instead of the sale price
- ○ **C** They worked out 50% wrongly
- ○ **D** They used the wrong percentage

12 A jacket costs **$120** with **25% off**. A student answered **$30**. What did they do wrong? F1.1 · TH

- ○ **A** They worked out 25% wrongly
- ○ **B** They gave the discount instead of the sale price
- ○ **C** They added the discount instead of subtracting
- ○ **D** They used the wrong percentage

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VOLUME 3 · SHEET 14

Spot The Mistake — Median

ERROR Strand D · Data · D1.5

They took the middle of an unsorted list. A median means nothing until you order the data.

1 Asked for the **median** of **43, 49, 56, 31, 25**, a student answered **56**.
What did they do wrong? D1.5 · TH

- ○ **A** They found the range instead
- ○ **B** They found the mean instead
- ○ **C** They took the middle of the list without putting the numbers in order first
- ○ **D** They found the mode instead

2 Asked for the **median** of **50, 46, 58, 13, 34**, a student answered **58**.
What did they do wrong? D1.5 · TH

- ○ **A** They took the middle of the list without putting the numbers in order first
- ○ **B** They found the range instead
- ○ **C** They found the mode instead
- ○ **D** They found the mean instead

3 Asked for the **median** of **52, 29, 46, 19, 40**, a student answered **46**.
What did they do wrong? D1.5 · TH

- ○ **A** They took the middle of the list without putting the numbers in order first
- ○ **B** They found the mode instead
- ○ **C** They found the range instead
- ○ **D** They found the mean instead

4 Asked for the **median** of **45, 53, 33, 11, 56**, a student answered **33**.
What did they do wrong? D1.5 · TH

- ○ **A** They took the middle of the list without putting the numbers in order first
- ○ **B** They found the range instead
- ○ **C** They found the mean instead
- ○ **D** They found the mode instead

5 Asked for the **median** of **44, 48, 24, 16, 55**, a student answered **24**.
What did they do wrong? D1.5 · TH

- ○ **A** They found the mean instead
- ○ **B** They found the mode instead
- ○ **C** They found the range instead
- ○ **D** They took the middle of the list without putting the numbers in order first

6 Asked for the **median** of **50, 43, 20, 58, 48**, a student answered **20**.
What did they do wrong? D1.5 · TH

- ○ **A** They found the mode instead
- ○ **B** They found the mean instead
- ○ **C** They took the middle of the list without putting the numbers in order first
- ○ **D** They found the range instead

7 Asked for the **median** of **34, 27, 32, 42, 38**, a student answered **32**.
What did they do wrong? D1.5 · TH

- ○ **A** They found the range instead
- ○ **B** They found the mean instead
- ○ **C** They took the middle of the list without putting the numbers in order first
- ○ **D** They found the mode instead

8 Asked for the **median** of **26, 14, 54, 41, 15**, a student answered **54**.
What did they do wrong? D1.5 · TH

- ○ **A** They found the mean instead
- ○ **B** They took the middle of the list without putting the numbers in order first
- ○ **C** They found the mode instead
- ○ **D** They found the range instead

9 Asked for the **median** of **14, 43, 11, 42, 13**, a student answered **11**.
What did they do wrong? D1.5 · TH

- ○ **A** They took the middle of the list without putting the numbers in order first
- ○ **B** They found the range instead
- ○ **C** They found the mean instead
- ○ **D** They found the mode instead

10 Asked for the **median** of **13, 41, 50, 38, 35**, a student answered **50**.
What did they do wrong? D1.5 · TH

- ○ **A** They took the middle of the list without putting the numbers in order first
- ○ **B** They found the mode instead
- ○ **C** They found the range instead
- ○ **D** They found the mean instead

11 Asked for the **median** of **18, 27, 15, 55, 12**, a student answered **15**.
What did they do wrong? D1.5 · TH

- ○ **A** They found the mean instead
- ○ **B** They found the range instead
- ○ **C** They took the middle of the list without putting the numbers in order first
- ○ **D** They found the mode instead

12 Asked for the **median** of **32, 31, 30, 19, 57**, a student answered **30**.
What did they do wrong? D1.5 · TH

- ○ **A** They found the mean instead
- ○ **B** They found the range instead
- ○ **C** They took the middle of the list without putting the numbers in order first
- ○ **D** They found the mode instead

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VOLUME 3 · SHEET 15

Area, Cost And Discount

THINKING Strand E · Spatial Sense · E2.4 · B2.12 · F1.1

Three steps across three strands. Stopping at the gross cost is the trap.

1 Decking panels cost **$3 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **25% off**. What is the final cost? E2.4 · TH

- A $108
- B $36
- C $144
- D $48

2 Decking panels cost **$3 per square metre**. A deck measures **9 m by 8 m**. The supplier gives **25% off**. What is the final cost? E2.4 · TH

- A $162
- B $216
- C $72
- D $54

3 Decking panels cost **$3 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **25% off**. What is the final cost? E2.4 · TH

- A $36
- B $48
- C $144
- D $108

4 Decking panels cost **$5 per square metre**. A deck measures **9 m by 8 m**. The supplier gives **25% off**. What is the final cost? E2.4 · TH

- A $90
- B $360
- C $270
- D $72

5 Decking panels cost **$6 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **25% off**. What is the final cost? E2.4 · TH

- A $216
- B $72
- C $48
- D $288

6 Decking panels cost **$5 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **20% off**. What is the final cost? E2.4 · TH

- A $192
- B $240
- C $48
- D 538

7 Decking panels cost **$6 per square metre**. A deck measures **12 m by 4 m**. The supplier gives **10% off**. What is the final cost? E2.4 · TH

- A $288
- B $260
- C $28
- D $48

8 Decking panels cost **$5 per square metre**. A deck measures **12 m by 4 m**. The supplier gives **20% off**. What is the final cost? E2.4 · TH

- A $240
- B 528
- C $48
- D $192

9 Decking panels cost **$3 per square metre**. A deck measures **10 m by 5 m**. The supplier gives **10% off**. What is the final cost? E2.4 · TH

- A $15
- B $50
- C $135
- D $150

10 Decking panels cost **$3 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **20% off**. What is the final cost? E2.4 · TH

- A $28
- B $116
- C $48
- D $144

11 Decking panels cost **$5 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **20% off**. What is the final cost? E2.4 · TH

- ◯ **A** $192
- ◯ **B** 132
- ◯ **C** $240
- ◯ **D** $48

12 Decking panels cost **$6 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **10% off**. What is the final cost? E2.4 · TH

- ◯ **A** $48
- ◯ **B** $288
- ◯ **C** $28
- ◯ **D** $260

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 16

From Tally To Probability

THINKING Strand D · Data · D1.5 · D2.1

Build the total from the data, then write the probability, then simplify it.

1 A tally of paint pots: 6 red · 6 blue · 2 green · 3 yellow.
One pot is taken at random. What is the probability it is **blue**, in simplest form? D2.1 · TH

- **A** 17/6
- **B** 6/4
- **C** 6/17
- **D** 6/11

2 A tally of paint pots: 7 red · 5 blue · 8 green · 7 yellow.
One pot is taken at random. What is the probability it is **blue**, in simplest form? D2.1 · TH

- **A** 5/27
- **B** 27/5
- **C** 5/4
- **D** 5/22

3 A tally of paint pots: 2 red · 2 blue · 8 green · 5 yellow.
One pot is taken at random. What is the probability it is **yellow**, in simplest form? D2.1 · TH

- **A** 5/12
- **B** 17/5
- **C** 5/4
- **D** 5/17

4 A tally of paint pots: 3 red · 6 blue · 4 green · 4 yellow.
One pot is taken at random. What is the probability it is **yellow**, in simplest form? D2.1 · TH

- **A** 4/4
- **B** 4/13
- **C** 17/4
- **D** 4/17

5 A tally of paint pots: 2 red · 6 blue · 2 green · 7 yellow.
One pot is taken at random. What is the probability it is **yellow**, in simplest form? D2.1 · TH

- **A** 17/7
- **B** 7/10
- **C** 7/17
- **D** 7/4

6 A tally of paint pots: 7 red · 6 blue · 8 green · 2 yellow.
One pot is taken at random. What is the probability it is **red**, in simplest form? D2.1 · TH

- **A** 7/16
- **B** 7/23
- **C** 23/7
- **D** 7/4

7 A tally of paint pots: 7 red · 3 blue · 8 green · 2 yellow.
One pot is taken at random. What is the probability it is **green**, in simplest form? D2.1 · TH

- **A** 20/8
- **B** 2/5
- **C** 8/4
- **D** 8/12

8 A tally of paint pots: 4 red · 8 blue · 5 green · 5 yellow.
One pot is taken at random. What is the probability it is **red**, in simplest form? D2.1 · TH

- **A** 22/4
- **B** 4/4
- **C** 4/18
- **D** 2/11

9 A tally of paint pots: 8 red · 3 blue · 6 green · 4 yellow.
One pot is taken at random. What is the probability it is **green**, in simplest form? D2.1 · TH

- **A** 2/7
- **B** 6/15
- **C** 21/6
- **D** 6/4

10 A tally of paint pots: 8 red · 7 blue · 8 green · 4 yellow.
One pot is taken at random. What is the probability it is **yellow**, in simplest form? D2.1 · TH

- **A** 27/4
- **B** 4/27
- **C** 4/4
- **D** 4/23

11 A tally of paint pots: 4 red · 4 blue · 2 green · 6 yellow.
One pot is taken at random. What is the probability it is **yellow**, in simplest form? D2.1 · TH

- ○ **A** 6/4
- ○ **B** 6/10
- ○ **C** 16/6
- ○ **D** 3/8

12 A tally of paint pots: 6 red · 6 blue · 7 green · 5 yellow.
One pot is taken at random. What is the probability it is **yellow**, in simplest form? D2.1 · TH

- ○ **A** 5/19
- ○ **B** 5/24
- ○ **C** 5/4
- ○ **D** 24/5

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 17

Pattern Rules As Equations

THINKING Strand C · Algebra · C1.3 · C2.3

A pattern rule and an equation are the same job in different clothes.

1 A pattern has the rule **value = 5 × term + 3**. Which **term number** has the value **53**? C2.3 · TH

- **A** 11
- **B** 990
- **C** 50
- **D** 10

2 A pattern has the rule **value = 4 × term + 1**. Which **term number** has the value **29**? C2.3 · TH

- **A** 7
- **B** 774
- **C** 8
- **D** 28

3 A pattern has the rule **value = 5 × term + 3**. Which **term number** has the value **43**? C2.3 · TH

- **A** 40
- **B** 8
- **C** 9
- **D** 76

4 A pattern has the rule **value = 3 × term + 2**. Which **term number** has the value **38**? C2.3 · TH

- **A** 12
- **B** 13
- **C** 36
- **D** 23

5 A pattern has the rule **value = 4 × term + 1**. Which **term number** has the value **45**? C2.3 · TH

- **A** 44
- **B** 11
- **C** 12
- **D** 262

6 A pattern has the rule **value = 5 × term + 3**. Which **term number** has the value **68**? C2.3 · TH

- **A** 65
- **B** 13
- **C** 14
- **D** 988

7 A pattern has the rule **value = 6 × term + 2**. Which **term number** has the value **80**? C2.3 · TH

- **A** 13
- **B** 78
- **C** 14
- **D** 860

8 A pattern has the rule **value = 4 × term + 1**. Which **term number** has the value **49**? C2.3 · TH

- **A** 12
- **B** 48
- **C** 450
- **D** 13

9 A pattern has the rule **value = 6 × term + 2**. Which **term number** has the value **86**? C2.3 · TH

- **A** 11
- **B** 15
- **C** 84
- **D** 14

10 A pattern has the rule **value = 5 × term + 3**. Which **term number** has the value **68**? C2.3 · TH

- **A** 13
- **B** 65
- **C** 771
- **D** 14

11 A pattern has the rule **value = 5 × term + 3**. Which **term number** has the value **63**? C2.3 · TH

- **A** 12
- **B** 60
- **C** 13
- **D** 266

12 A pattern has the rule **value = 4 × term + 1**. Which **term number** has the value **53**? C2.3 · TH

- **A** 14
- **B** 52
- **C** 878
- **D** 13

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 18

Rates And Unit Changes

THINKING Strand E · Spatial Sense · B2.12 · E2.1

Work out the amount, then convert. Answering in the wrong unit loses the mark.

1 A trench is dug at **40 m per minute** for **20 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.08 km
- **B** 0.8 km
- **C** 8 km
- **D** 800 km

2 A trench is dug at **40 m per minute** for **24 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 960 km
- **B** 0.096 km
- **C** 0.96 km
- **D** 9.6 km

3 A trench is dug at **20 m per minute** for **30 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.6 km
- **B** 0.06 km
- **C** 600 km
- **D** 6 km

4 A trench is dug at **50 m per minute** for **12 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 600 km
- **B** 6 km
- **C** 0.06 km
- **D** 0.6 km

5 A trench is dug at **50 m per minute** for **24 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 12 km
- **B** 1.2 km
- **C** 0.12 km
- **D** 1200 km

6 A trench is dug at **50 m per minute** for **20 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.1 km
- **B** 10 km
- **C** 1000 km
- **D** 1 km

7 A trench is dug at **20 m per minute** for **24 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.048 km
- **B** 0.48 km
- **C** 480 km
- **D** 4.8 km

8 A trench is dug at **40 m per minute** for **24 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.096 km
- **B** 960 km
- **C** 0.96 km
- **D** 9.6 km

9 A trench is dug at **25 m per minute** for **12 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.3 km
- **B** 300 km
- **C** 3 km
- **D** 0.03 km

10 A trench is dug at **20 m per minute** for **24 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.048 km
- **B** 4.8 km
- **C** 0.48 km
- **D** 480 km

11 A trench is dug at **25 m per minute** for **20 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.05 km
- **B** 500 km
- **C** 5 km
- **D** 0.5 km

12 A trench is dug at **15 m per minute** for **30 minutes**. How far is that in **kilometres**? E2.1 · TH

- **A** 0.045 km
- **B** 4.5 km
- **C** 450 km
- **D** 0.45 km

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 19

Surface Area And Budget

THINKING Strand E · Spatial Sense · E2.6 · B2.12

Six faces, then a cost. Volume would be the wrong measure entirely.

1 A planter is a rectangular prism **5 m × 5 m × 2 m**. Sealant covers **1 m² per $2**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $100
- **B** $90
- **C** 385
- **D** $180

2 A planter is a rectangular prism **5 m × 4 m × 3 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $94
- **B** $180
- **C** $282
- **D** $141

3 A planter is a rectangular prism **4 m × 3 m × 2 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $52
- **B** $78
- **C** $156
- **D** $72

4 A planter is a rectangular prism **6 m × 2 m × 3 m**. Sealant covers **1 m² per $2**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $144
- **B** 519
- **C** $72
- **D** 855

5 A planter is a rectangular prism **4 m × 3 m × 2 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $78
- **B** $52
- **C** $72
- **D** $156

6 A planter is a rectangular prism **4 m × 3 m × 2 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $72
- **B** $156
- **C** $52
- **D** $78

7 A planter is a rectangular prism **6 m × 2 m × 3 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $216
- **B** $108
- **C** $72
- **D** 716

8 A planter is a rectangular prism **6 m × 2 m × 3 m**. Sealant covers **1 m² per $2**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** 402
- **B** 968
- **C** $72
- **D** $144

9 A planter is a rectangular prism **5 m × 5 m × 2 m**. Sealant covers **1 m² per $5**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $90
- **B** $450
- **C** $250
- **D** $225

10 A planter is a rectangular prism **5 m × 4 m × 3 m**. Sealant covers **1 m² per $5**. What does it cost to seal **all six faces?** E2.6 · TH

- **A** $470
- **B** $300
- **C** $235
- **D** $94

11 A planter is a rectangular prism **6 m × 2 m × 3 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces**? E2.6 · TH

- ◯ **A** $108
- ◯ **B** 745
- ◯ **C** $216
- ◯ **D** $72

12 A planter is a rectangular prism **6 m × 2 m × 3 m**. Sealant covers **1 m² per $2**. What does it cost to seal **all six faces**? E2.6 · TH

- ◯ **A** 351
- ◯ **B** $144
- ◯ **C** $72
- ◯ **D** 269

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VOLUME 3 · SHEET 20

Estimation

THINKING Strand B · Number · B2.3

Round first. An estimate tells you whether your exact answer is sensible.

1 Estimate the total of **2.12 + 1.79 + 5.88 + 1.42.** B2.3 · TH

- ○ **A** about 5
- ○ **B** about 11
- ○ **C** about 22
- ○ **D** about 21

2 Estimate the total of **3.34 + 5.62 + 5.22 + 5.08.** B2.3 · TH

- ○ **A** about 38
- ○ **B** about 19
- ○ **C** about 9
- ○ **D** about 29

3 **Without working it out exactly**, which is closest to **36 × 22**? B2.3 · TH

- ○ **A** about 8000
- ○ **B** about 80
- ○ **C** about 800
- ○ **D** about 58

4 Estimate the total of **1.04 + 4.29 + 7.95 + 2.94.** B2.3 · TH

- ○ **A** about 8
- ○ **B** about 26
- ○ **C** about 32
- ○ **D** about 16

5 **Without working it out exactly**, roughly what is **77 ÷ 4**? B2.3 · TH

- ○ **A** about 76
- ○ **B** about 9
- ○ **C** about 73
- ○ **D** about 19

6 Estimate **21% of 400.** B2.3 · TH

- ○ **A** about 80
- ○ **B** about 40
- ○ **C** about 160
- ○ **D** about 21

7 **Without working it out exactly**, which is closest to **72 × 39**? B2.3 · TH

- ○ **A** about 28000
- ○ **B** about 280
- ○ **C** about 111
- ○ **D** about 2800

8 Estimate **49% of 800.** B2.3 · TH

- ○ **A** about 49
- ○ **B** about 200
- ○ **C** about 800
- ○ **D** about 400

9 **Without working it out exactly**, which is closest to **21 × 84**? B2.3 · TH

- ○ **A** about 160
- ○ **B** about 1600
- ○ **C** about 105
- ○ **D** about 16000

10 **Without working it out exactly**, which is closest to **79 × 38**? B2.3 · TH

- ○ **A** about 320
- ○ **B** about 3200
- ○ **C** about 32000
- ○ **D** about 117

11 **Without working it out exactly**, roughly what is **63 ÷ 5**? B2.3 · TH

- ○ **A** about 58
- ○ **B** about 6
- ○ **C** about 13
- ○ **D** about 65

12 Estimate the total of **7.85 + 6.79 + 7.77 + 4.90.** B2.3 · TH

- ○ **A** about 56
- ○ **B** about 14
- ○ **C** about 38
- ○ **D** about 28

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VOLUME 3 · SHEET 21

Is That Reasonable?

THINKING Strand B · Number · B2.1

A door is not 2.1 km. A probability is never 1.4. A mean sits between the smallest and largest.

1 A student wrote the probability of an event as **1.4**. What should it be? B2.1 · TH

- **A** 20
- **B** 2.1 m
- **C** 0.4 or any value from 0 to 1
- **D** 14

2 A student wrote the probability of an event as **1.4**. What should it be? B2.1 · TH

- **A** 14
- **B** 20
- **C** 0.4 or any value from 0 to 1
- **D** 2.1 m

3 A student wrote the probability of an event as **1.4**. What should it be? B2.1 · TH

- **A** 20
- **B** 14
- **C** 2.1 m
- **D** 0.4 or any value from 0 to 1

4 A student found the mean of 12, 14 and 16 and wrote **42**. What should it be? B2.1 · TH

- **A** 14
- **B** 2.1 m
- **C** 20 cm²
- **D** 20

5 A student worked out 25% of 80 and wrote **320**. What should it be? B2.1 · TH

- **A** 20 cm²
- **B** 20
- **C** 2.1 m
- **D** 14

6 A student found the area of a 5 cm by 4 cm rectangle and wrote **18 cm²**. What should it be? B2.1 · TH

- **A** 20 cm²
- **B** 2.1 m
- **C** 14
- **D** 20

7 A student measured a classroom door and wrote **2.1 km**. What should it be? B2.1 · TH

- **A** 14
- **B** 2.1 m
- **C** 20
- **D** 20 cm²

8 A student found the area of a 5 cm by 4 cm rectangle and wrote **18 cm²**. What should it be? B2.1 · TH

- **A** 20
- **B** 20 cm²
- **C** 2.1 m
- **D** 14

9 A student found the mean of 12, 14 and 16 and wrote **42**. What should it be? B2.1 · TH

- **A** 2.1 m
- **B** 20
- **C** 20 cm²
- **D** 14

10 A student wrote the probability of an event as **1.4**. What should it be? B2.1 · TH

- **A** 20
- **B** 2.1 m
- **C** 0.4 or any value from 0 to 1
- **D** 14

11 A student worked out 25% of 80 and wrote **320**. What should it be? B2.1 · TH

- ○ **A** 2.1 m
- ○ **B** 20 cm²
- ○ **C** 20
- ○ **D** 14

12 A student wrote the probability of an event as **1.4**. What should it be? B2.1 · TH

- ○ **A** 2.1 m
- ○ **B** 14
- ○ **C** 0.4 or any value from 0 to 1
- ○ **D** 20

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VOLUME 3 · SHEET 22

Working Backwards

THINKING Strand E · Spatial Sense · E2.4 · B2.12 · D1.5

Given the answer, find the input. Same formula, run in reverse.

1 **20%** of a number is **15**. What is the number? B2.12 · TH

- **A** 75
- **B** 37
- **C** 35
- **D** 3

2 The mean of **4** numbers is **16**. 3 of them are **9, 5, 5**. What is the missing number? D1.5 · TH

- **A** 64
- **B** 29
- **C** 16
- **D** 45

3 A machine cuts **12 tiles per minute** and has cut **84** tiles. How long has it been running? B2.12 · TH

- **A** 72 minutes
- **B** 1008 minutes
- **C** 12 minutes
- **D** 7 minutes

4 The mean of **5** numbers is **16**. Four of them are **4, 11, 20, 10**. What is the missing number? D1.5 · TH

- **A** 19
- **B** 16
- **C** 80
- **D** 35

5 **50%** of a number is **12**. What is the number? B2.12 · TH

- **A** 24
- **B** 12
- **C** 62
- **D** 6

6 A machine cuts **15 tiles per minute** and has cut **90** tiles. How long has it been running? B2.12 · TH

- **A** 75 minutes
- **B** 1350 minutes
- **C** 15 minutes
- **D** 6 minutes

7 A machine cuts **15 tiles per minute** and has cut **135** tiles. How long has it been running? B2.12 · TH

- **A** 120 minutes
- **B** 2025 minutes
- **C** 15 minutes
- **D** 9 minutes

8 A rectangle has an area of **48 cm²** and a height of **6 cm**. What is its base? E2.4 · TH

- **A** 4 cm
- **B** 8 cm
- **C** 42 cm
- **D** 288 cm

9 **25%** of a number is **40**. What is the number? B2.12 · TH

- **A** 65
- **B** 80
- **C** 10
- **D** 160

10 **25%** of a number is **40**. What is the number? B2.12 · TH

- **A** 80
- **B** 10
- **C** 160
- **D** 65

11 **20%** of a number is **30**. What is the number? B2.12 · TH

- **A** 150
- **B** 6
- **C** 75
- **D** 50

12 A rectangle has an area of **60 cm²** and a height of **5 cm**. What is its base? E2.4 · TH

- **A** 55 cm
- **B** 6 cm
- **C** 300 cm
- **D** 12 cm

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

VOLUME 3 · SHEET 23

Choose All That Apply

FORMAT Strand B · Number · C2.2 · E1.1 · B2.6

More than one answer is correct. Students routinely find one and stop.

1 Select **every** multiple of **9**. B2.2 · KU

Select **all** that apply.

- ☐ **A** 46
- ☐ **B** 19
- ☐ **C** 37
- ☐ **D** 63
- ☐ **E** 36

2 Select **every** statement that is true of a **rhombus**. E1.1 · AP

Select **all** that apply.

- ☐ **A** the diagonals meet at right angles
- ☐ **B** the diagonals are equal in length
- ☐ **C** all four sides are equal
- ☐ **D** all four angles are right angles
- ☐ **E** it has four lines of symmetry

3 Select **every** prime number. B2.6 · KU

Select **all** that apply.

- ☐ **A** 19
- ☐ **B** 17
- ☐ **C** 39
- ☐ **D** 57
- ☐ **E** 21

4 Select **every** prime number. B2.6 · KU

Select **all** that apply.

- ☐ **A** 31
- ☐ **B** 21
- ☐ **C** 51
- ☐ **D** 49
- ☐ **E** 43

5 Select **every** expression equal to **24**. C2.2 · AP

Select **all** that apply.

- ☐ **A** 24 − 3
- ☐ **B** 12 + 12
- ☐ **C** 24 + 2
- ☐ **D** 48 ÷ 2

6 Select **every** multiple of **6**. B2.2 · KU

Select **all** that apply.

- ☐ **A** 25
- ☐ **B** 42
- ☐ **C** 18
- ☐ **D** 31
- ☐ **E** 13

7 Select **every** multiple of **6**. B2.2 · KU

Select **all** that apply.

- ☐ **A** 13
- ☐ **B** 18
- ☐ **C** 25
- ☐ **D** 48
- ☐ **E** 19

8 Select **every** statement that is true of a **rhombus.** E1.1 · AP

Select **all** that apply.

- ☐ **A** it has four lines of symmetry
- ☐ **B** the diagonals meet at right angles
- ☐ **C** the diagonals are equal in length
- ☐ **D** all four sides are equal
- ☐ **E** all four angles are right angles

9 Select **every** prime number. B2.6 · KU

Select **all** that apply.

- ☐ **A** 51
- ☐ **B** 91
- ☐ **C** 49
- ☐ **D** 17
- ☐ **E** 31

10 Select **every** prime number. B2.6 · KU

Select **all** that apply.

- ☐ **A** 13
- ☐ **B** 37
- ☐ **C** 51
- ☐ **D** 39
- ☐ **E** 33

11 Select **every** multiple of **9.** B2.2 · KU

Select **all** that apply.

- ☐ **A** 37
- ☐ **B** 36
- ☐ **C** 28
- ☐ **D** 46
- ☐ **E** 18

12 Select **every** multiple of **3.** B2.2 · KU

Select **all** that apply.

- ☐ **A** 24
- ☐ **B** 15
- ☐ **C** 16
- ☐ **D** 10
- ☐ **E** 7

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VOLUME 3 · SHEET 24

Putting Things In Order

FORMAT Strand B · Number · B1.3 · E2.4

On screen you would drag these. Work out every value before you order them.

1 Put these in order from **smallest area to largest**. Which order is right? E2.4 · TH

- ○ **A** a rhombus with diagonals 8 cm and 6 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a triangle with base 10 cm and height 4 cm
- ○ **B** a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a rhombus with diagonals 8 cm and 6 cm → a triangle with base 10 cm and height 4 cm
- ○ **C** 742
- ○ **D** a triangle with base 10 cm and height 4 cm → a rhombus with diagonals 8 cm and 6 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm

2 Which list is in order from **least to greatest**? B1.3 · AP

- ○ **A** 2, 3/4, −1, −2
- ○ **B** −2, −1, 3/4, 2
- ○ **C** 3/4, −1, −2, 2
- ○ **D** 631

3 Put these in order from **smallest area to largest**. Which order is right? E2.4 · TH

- ○ **A** a 4 cm by 4 cm square → a rhombus with diagonals 8 cm and 6 cm → a 6 cm by 5 cm rectangle
- ○ **B** a 4 cm by 4 cm square → a 6 cm by 5 cm rectangle → a rhombus with diagonals 8 cm and 6 cm
- ○ **C** a 6 cm by 5 cm rectangle → a rhombus with diagonals 8 cm and 6 cm → a 4 cm by 4 cm square
- ○ **D** 509

4 Which list is in order from **least to greatest**? B1.3 · AP

- ○ **A** 1/5, 0.5, −2, 2
- ○ **B** −2, 1/5, 0.5, 2
- ○ **C** 0.5, 1/5, 2, −2
- ○ **D** 2, 0.5, 1/5, −2

5 Put these in order from **smallest area to largest**. Which order is right? E2.4 · TH

- ○ **A** a 6 cm by 5 cm rectangle → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a triangle with base 10 cm and height 4 cm
- ○ **B** 52
- ○ **C** 622
- ○ **D** a triangle with base 10 cm and height 4 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a 6 cm by 5 cm rectangle

6 Which list of fractions is in order from **smallest to largest**? B1.3 · AP

- ○ **A** 1/2, 2/3, 3/4, 7/10
- ○ **B** 577
- ○ **C** 3/4, 7/10, 2/3, 1/2
- ○ **D** 1/2, 2/3, 7/10, 3/4

7 Put these in order from **smallest area to largest**. Which order is right? E2.4 · TH

- ○ **A** a 6 cm by 5 cm rectangle → a rhombus with diagonals 8 cm and 6 cm → a 4 cm by 4 cm square
- ○ **B** 53
- ○ **C** a 4 cm by 4 cm square → a rhombus with diagonals 8 cm and 6 cm → a 6 cm by 5 cm rectangle
- ○ **D** a 4 cm by 4 cm square → a 6 cm by 5 cm rectangle → a rhombus with diagonals 8 cm and 6 cm

8 Put these in order from **smallest area to largest.** Which order is right? E2.4 · TH

- ○ **A** 979
- ○ **B** a 6 cm by 5 cm rectangle → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a triangle with base 10 cm and height 4 cm
- ○ **C** 450
- ○ **D** a triangle with base 10 cm and height 4 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a 6 cm by 5 cm rectangle

9 Which list of fractions is in order from **smallest to largest**? B1.3 · AP

- ○ **A** 642
- ○ **B** 3/4, 7/10, 2/5, 1/4
- ○ **C** 1/4, 2/5, 3/4, 7/10
- ○ **D** 1/4, 2/5, 7/10, 3/4

10 Put these in order from **smallest area to largest.** Which order is right? E2.4 · TH

- ○ **A** 103
- ○ **B** 625
- ○ **C** a triangle with base 10 cm and height 4 cm → a rhombus with diagonals 8 cm and 6 cm → a 6 cm by 5 cm rectangle
- ○ **D** a 6 cm by 5 cm rectangle → a rhombus with diagonals 8 cm and 6 cm → a triangle with base 10 cm and height 4 cm

11 Which list is in order from **least to greatest**? B1.3 · AP

- ○ **A** 3/4, 1/5, −0.25, −1
- ○ **B** −1, −0.25, 1/5, 3/4
- ○ **C** 1/5, 3/4, −0.25, −1
- ○ **D** 1/5, −0.25, 3/4, −1

12 Which list is in order from **least to greatest**? B1.3 · AP

- ○ **A** 0.5, 1/5, 3/4, −0.25
- ○ **B** −0.25, 1/5, 0.5, 3/4
- ○ **C** 1/5, −0.25, 0.5, 3/4
- ○ **D** 3/4, 0.5, 1/5, −0.25

Every answer in the key carries the reason and the expectation code. On the Thinking sheets, read the reason even when you got it right — the method is the point.

TWELVE WEEKS · WEEK 1 · SHEET 25

Week 1

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 **51.668 kg** of fixings is shared equally between **10** crates. How much per crate? B2.11 · AP

- **A** 51.668 kg
- **B** 5.1668 kg
- **C** 41.668 kg
- **D** 516.68 kg

2 Write **60** as a product of its **prime factors.** B2.6 · AP

- **A** 1×60
- **B** $2^2 \times 3 \times 5$
- **C** $2 \times 3 \times 5$
- **D** $2^2 \times 3$

3 **5/6** of the **30** saplings ordered are maple. How many are maple? B2.9 · AP

- **A** 25
- **B** 24
- **C** 5
- **D** 36

4 Solve the inequality **3x + 9 < 21**. What is the **greatest whole number** value of x? C2.4 · AP

- **A** 3
- **B** 12
- **C** 36
- **D** 5

5 Two programs both add **5** to a total **6** times.
Program A writes `add 5 to total` out 6 separate times.
Program B writes `repeat 6 times: add 5 to total`.
Which is more **efficient**, and why? C3.2 · TH

- **A** They are equally efficient because the answer is the same
- **B** Program B — it uses a loop, so fewer lines do the same work
- **C** Program A — more lines means more gets done
- **D** Program A — loops always run more slowly

6 A rival proposal shows a graph where **the bars are drawn as 3-D blocks of different depths**. Why is this misleading? D1.6 · TH

- **A** It exaggerates small differences — the bars look many times taller than each other.
- **B** Unequal intervals distort the shape of the data.
- **C** Choosing which data to leave out can reverse the apparent trend.
- **D** Extra dimensions make some bars look bigger than their value.

7 A stem-and-leaf plot shows:
4 | 0 1 4 6 7
What is the **median**? D1.3 · AP

- **A** 40
- **B** 860
- **C** 44
- **D** 47

8 A planter is a rectangular prism **3 cm × 10 cm × 9 cm**. What is its **surface area**? E2.6 · AP

- **A** 270 cm^3
- **B** 294 cm^2
- **C** 147 cm^2
- **D** 44 cm^2

9 A **kite** has diagonals of **18 cm** and **12 cm**. What is its area? E2.4 · AP

- **A** 30 cm^2
- **B** 60 cm^2
- **C** 108 cm^2
- **D** 216 cm^2

10 Does **asking for the money as a gift instead of something else** help or interfere with reaching a financial goal?

F1.3 · KU

- ◯ **A** it helps
- ◯ **B** it interferes
- ◯ **C** it makes no difference
- ◯ **D** it does both equally

Mark against the expectation code, not out of ten. A code missed twice across two weeks is a teaching target; one miss is noise.

Week 2

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 A rectangle has an area of **60 cm²** and a height of **5 cm**. What is its base? E2.4 · TH

- **A** 300 cm
- **B** 12 cm
- **C** 6 cm
- **D** 55 cm

2 On a vertical number line, the basement floor is at **-3** and the roof deck is at **11**. How many units apart are they? B1.2 · AP

- **A** 14
- **B** 16
- **C** 8
- **D** -8

3 Round **28.501** to the nearest **whole number**. B1.5 · KU

- **A** 29
- **B** 989
- **C** 28.51
- **D** 28.5

4 Three patterns:
P starts at 3, rule **add 5**
Q starts at 83, rule **subtract 10**
R starts at 33, rule **multiply by 2**
Which number appears in **all three** patterns? C1.3 · TH

- **A** 33
- **B** 38
- **C** 73
- **D** 66

5 Solve for x: **7x + 14 = 112** C2.3 · AP

- **A** 98
- **B** 14
- **C** 105
- **D** 28

6 Which graph best represents **visitor numbers grouped into the intervals 0-9, 10-19, 20-29 and 30-39 years of age**? D1.3 · KU

- **A** circle graph
- **B** histogram
- **C** bar graph
- **D** broken-line graph

7 A spinner has **20** equal sections. **14** of them are green. What is the probability of landing on green, as a **percent**? D2.1 · AP

- **A** 35%
- **B** 6%
- **C** 70%
- **D** 14%

8 Decking panels cost **$5 per square metre**. A deck measures **8 m by 6 m**. The supplier gives **20% off**. What is the final cost? E2.4 · TH

- **A** 194
- **B** $192
- **C** $48
- **D** $240

9 Select **every** statement that is true of a **rhombus.** E1.1 · AP

Select **all** that apply.

- ☐ **A** all four angles are right angles
- ☐ **B** the diagonals meet at right angles
- ☐ **C** all four sides are equal
- ☐ **D** the diagonals are equal in length
- ☐ **E** it has four lines of symmetry

10 Does **a price rise on the thing you are saving for** help or interfere with reaching a financial goal? F1.3 · AP

- ◯ **A** it makes no difference
- ◯ **B** it guarantees failure
- ◯ **C** it interferes
- ◯ **D** it helps

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Week 3

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 Two lengths of cedar measure **95.25 m** and **3.14 m**. What is the total length? B2.4 · AP

- **A** 98.49
- **B** 98.39
- **C** 983.90
- **D** 92.11

2 **10** litres of sealant is poured into cans holding **0.5 L** each. How many cans? B2.8 · AP

- **A** 2
- **B** 5
- **C** 9.5
- **D** 20

3 **15%** of the **50** survey replies asked for a green roof. How many replies? B2.12 · AP

- **A** 35
- **B** 15
- **C** 7.5
- **D** 0.75

4 A pattern: **0.5, 0.75, 1, 1.25,** … What comes next? C1.4 · AP

- **A** 1.5
- **B** 1.75
- **C** 2.5
- **D** 2.25

5 A pattern begins **2, 4, 6, 8,** … Which describes it? C1.1 · KU

- **A** shrinking — it goes down each time
- **B** non-linear growing — the jump gets bigger each time
- **C** linear growing — it goes up by the same amount each time
- **D** repeating — the same block comes round again

6 A tally of paint pots: 8 red · 4 blue · 5 green · 8 yellow.
One pot is taken at random. What is the probability it is **red**, in simplest form? D2.1 · TH

- **A** 8/17
- **B** 8/25
- **C** 8/4
- **D** 25/8

7 Heights in centimetres: **22, 25, 26, 32, 45, 54, 55**
What is the **mean**? D1.5 · TH

- **A** 32
- **B** 33
- **C** 37
- **D** 55

8 Two angles are **supplementary**. One is **45°**. What is the other? E2.3 · KU

- **A** 315°
- **B** 988
- **C** 45°
- **D** 135°

9 A planter is a rectangular prism **5 cm × 7 cm × 10 cm**. What is its **surface area**? E2.6 · AP

- **A** 310 cm^2
- **B** 44 cm^2
- **C** 155 cm^2
- **D** 350 cm^3

10 Does **keeping savings in the same account you spend from** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it interferes
- **B** it guarantees failure
- **C** it helps
- **D** it makes no difference

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TWELVE WEEKS · WEEK 4 · SHEET 28

Week 4

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 **5/6** of the **36** saplings ordered are maple. How many are maple? B2.9 · AP

- **A** 964
- **B** 6
- **C** 30
- **D** 43

2 Estimate the total of **8.14 + 4.14 + 7.74 + 6.88**. B2.3 · TH

- **A** about 54
- **B** about 27
- **C** about 37
- **D** about 13

3 Put these in order from **smallest area to largest**. Which order is right? E2.4 · TH

- **A** 72
- **B** a 4 cm by 4 cm square → a triangle with base 10 cm and height 4 cm → a rhombus with diagonals 8 cm and 6 cm
- **C** a rhombus with diagonals 8 cm and 6 cm → a triangle with base 10 cm and height 4 cm → a 4 cm by 4 cm square
- **D** a 4 cm by 4 cm square → a rhombus with diagonals 8 cm and 6 cm → a triangle with base 10 cm and height 4 cm

4 This code should display **"Correct"** when a whole number is divisible by **4**.

```
input number
if number ______
  then display "Correct"
end
```

Which condition completes it? C3.1 · AP

- **A** has its last two digits divisible by 4
- **B** has a last digit of 0 or 5
- **C** is divisible by both 2 and 5
- **D** has an even last digit

5

```
set total to 5
repeat 5 times
  add 2 to total
end repeat
```

The **5** is changed to **6**. What is the new total? C3.2 · AP

- **A** 15
- **B** 12
- **C** 17
- **D** 19

6 After **40** spins the experimental probability is **5/40**, but the theoretical probability is **1/6**. Why are they different? D2.2 · TH

- **A** The spinner must be unfair
- **B** Experimental probability is always larger
- **C** The theoretical probability was worked out wrongly
- **D** Random variation — a finite number of trials rarely matches the theory exactly

7 Is **the mass of a bag of gravel** discrete or continuous data? D1.1 · KU

- **A** continuous
- **B** qualitative
- **C** neither
- **D** discrete

8 A shape undergoes **a reflection in the y-axis then a rotation of 180° about the origin**. What is the result? E1.4 · TH

- ◯ **A** the shape has been enlarged
- ◯ **B** the same result as a single reflection in the x-axis
- ◯ **C** the shape is back exactly where it started
- ◯ **D** the shape is on the other side, 3 units from where it started

9 Decking panels cost **$5 per square metre**. A deck measures **9 m by 8 m**. The supplier gives **20% off**. What is the final cost? E2.4 · TH

- ◯ **A** $288
- ◯ **B** 401
- ◯ **C** $72
- ◯ **D** $360

10 Does **buying small things often without recording them** help or interfere with reaching a financial goal? F1.3 · AP

- ◯ **A** it helps
- ◯ **B** it interferes
- ◯ **C** it guarantees failure
- ◯ **D** it makes no difference

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TWELVE WEEKS · WEEK 5 · SHEET 29

Week 5

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 Round **89.262** to the nearest **hundredth.** B1.5 · KU

- ○ **A** 90
- ○ **B** 89.27
- ○ **C** 89.26
- ○ **D** 89.2

2 Select the **TWO** prime numbers. B2.6 · KU

Select **all** that apply.

- ☐ **A** 57
- ☐ **B** 31
- ☐ **C** 35
- ☐ **D** 49
- ☐ **E** 17

3 Work out **2/3 + 3/5.** B2.5 · AP

- ○ **A** 2/5
- ○ **B** 11/17
- ○ **C** 1/15
- ○ **D** 19/15

4 Simplify **4x + 4x.** C2.1 · KU

- ○ **A** $8x^2$
- ○ **B** 16x
- ○ **C** 8x
- ○ **D** 4x4

5 In which equation does **p** have the **greatest** value?

A 3p = 123
B 58 + p = 91
C 5p = 195
D 71 + p = 118 C2.3 · TH

- ○ **A** 3p = 123
- ○ **B** 58 + p = 91
- ○ **C** 5p = 195
- ○ **D** 71 + p = 118

6 A class surveys the school by **asking only students who already play an instrument whether music should be compulsory.** What is that? D1.2 · AP

- ○ **A** a biased sample
- ○ **B** 806
- ○ **C** a random sample of library users
- ○ **D** the whole population, not a sample

7 Asked for the **median** of **11, 29, 55, 45, 43**, a student answered **55.**
What did they do wrong? D1.5 · TH

- ○ **A** They found the mean instead
- ○ **B** They found the range instead
- ○ **C** They took the middle of the list without putting the numbers in order first
- ○ **D** They found the mode instead

8 A rotation of **90° counterclockwise** about a point has the same result as which rotation? E1.4 · AP

- ○ **A** 90° clockwise
- ○ **B** 422
- ○ **C** 270° clockwise
- ○ **D** 270° counterclockwise

9 Two lines cross. One angle is **39°**. What is the angle **opposite** it? E2.3 · KU

- ○ **A** 51°
- ○ **B** 141°
- ○ **C** 39°
- ○ **D** 321°

10 Does **keeping the savings in a separate account** help or interfere with reaching a financial goal? F1.3 · KU

- ○ **A** it interferes
- ○ **B** it makes no difference
- ○ **C** it helps
- ○ **D** it does both equally

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TWELVE WEEKS · WEEK 6 · SHEET 30

Week 6

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 Sand and cement are mixed in the ratio **3 : 4**. If **21 kg** of sand is used, how much cement? B2.12 · AP

- **A** 49 kg
- **B** 28 kg
- **C** 21 kg
- **D** 4 kg

2 Is **51** a prime number or a composite number? B2.6 · KU

- **A** both
- **B** composite
- **C** prime
- **D** neither

3 A student worked out **1/5 + 3/6 = 4/11**.
What did they do wrong? B2.5 · TH

- **A** They used the wrong common denominator
- **B** They added the numerators instead of multiplying them
- **C** They forgot to simplify the answer
- **D** They added the denominators instead of finding a common denominator

4 A pattern starts at **12** with the rule **add 4**. Asked for the **5th** term, a student wrote **16**.
What did they do wrong? C1.3 · TH

- **A** They subtracted instead of adding
- **B** They applied the rule 5 times instead of 4
- **C** They applied the rule once instead of 4 times
- **D** They used the wrong starting number

5 Four term values of a growing pattern are shown.
Term number: 3 · 5 · 7 · ?
Term value: 10 · 16 · 22 · 40
What is the **term number** when the term value is 40? C1.3 · AP

- **A** 40
- **B** 13
- **C** 27
- **D** 15

6 A stem-and-leaf plot shows:
5 | 1 2 4 6
What is the **median**? D1.3 · AP

- **A** 56
- **B** 51
- **C** 53
- **D** 50

7 What is an **infographic** meant to do with a data set? D1.4 · KU

- **A** make the data look more impressive than it is
- **B** tell a story about the data using graphs, numbers and other relevant information together
- **C** show every single data value in a long table
- **D** replace the need for any titles, labels or sources

8 What is the **order of rotational symmetry** of a **rhombus**? E1.1 · KU

- **A** 2
- **B** 5
- **C** 6
- **D** 4

9 A shape undergoes **a rotation of 180° then another rotation of 180°**. What is the result? E1.4 · TH

- ◯ **A** the shape is on the other side, 3 units from where it started
- ◯ **B** the shape has been enlarged
- ◯ **C** the shape is back exactly where it started
- ◯ **D** the same result as a single reflection in the x-axis

10 Does **keeping the savings in a separate account** help or interfere with reaching a financial goal? F1.3 · KU

- ◯ **A** it interferes
- ◯ **B** it makes no difference
- ◯ **C** it does both equally
- ◯ **D** it helps

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TWELVE WEEKS · WEEK 7 · SHEET 31

Week 7

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.

1 Put these in order from **smallest area to largest**. Which order is right? E2.4 · TH

- **A** a 6 cm by 5 cm rectangle → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a triangle with base 10 cm and height 4 cm
- **B** a triangle with base 10 cm and height 4 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a 6 cm by 5 cm rectangle
- **C** 19
- **D** 761

2 Order these from **least to greatest: −3 · −1 · 3/4 · 0.2** B1.3 · AP

- **A** 0.2, 3/4, −1, −3
- **B** 988
- **C** 3/4, 0.2, −1, −3
- **D** −3, −1, 0.2, 3/4

3 Select the option that is **NOT** equal to **6 tenths.** B1.6 · AP

- **A** 0.6
- **B** 6/10
- **C** 0.06
- **D** 6.0

4
```
set total to 9
repeat 3 times
  increase total by 5
end repeat
```
What is **total** at the end? C3.2 · AP

- **A** 15
- **B** 24
- **C** 14
- **D** 32

5 A table of values pairs term number with term value:
(1, 11) · (2, 15) · (3, 19) · (4, 23)
What is the rule? C1.2 · AP

- **A** add 4 to the term number
- **B** multiply by 7, then add 4
- **C** multiply the term number by 5
- **D** multiply the term number by 4, then add 7

6 A spinner has **10** equal sections. **6** of them are green. What is the probability of landing on green, as a **percent**? D2.1 · AP

- **A** 6%
- **B** 60%
- **C** 4%
- **D** 30%

7 Which display **stacks an X above each value on a number line, so the shape of the data shows**? D1.3 · KU

- **A** tally table
- **B** line plot
- **C** histogram
- **D** frequency table

8 Which statement describes the **diagonals** of a **isosceles trapezoid**? E1.1 · KU

- **A** perpendicular and bisect each other, not equal
- **B** equal, perpendicular, bisect each other
- **C** equal, do not bisect
- **D** equal and bisect each other, not perpendicular

9 A rotation of **270° clockwise** about a point has the same result as which rotation? E1.4 · AP

- ◯ **A** 90° clockwise
- ◯ **B** 270° counterclockwise
- ◯ **C** 90° counterclockwise
- ◯ **D** 162

10 Does **keeping savings in the same account you spend from** help or interfere with reaching a financial goal? F1.3 · AP

- ◯ **A** it interferes
- ◯ **B** it guarantees failure
- ◯ **C** it makes no difference
- ◯ **D** it helps

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Week 8

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 Work out **3/4 − 3/4**. B2.5 · AP

- ○ **A** 3/4
- ○ **B** 0
- ○ **C** 9/16
- ○ **D** 3/2

2 **20** planters are ordered. **1/5** of them are cedar. How many are cedar? B2.9 · AP

- ○ **A** 4
- ○ **B** 20.0
- ○ **C** 15
- ○ **D** 100

3 The studio orders **5** boxes of **38** brackets, then returns **23** brackets. How many are kept? B2.1 · TH

- ○ **A** 75
- ○ **B** 213
- ○ **C** 190
- ○ **D** 167

4 Evaluate **5x + 8** when **x = 5.9**. C2.2 · AP

- ○ **A** 18.9
- ○ **B** 37.5
- ○ **C** 21.5
- ○ **D** 69.5

5 Solve the inequality **6x + 4 < 52**. What is the **greatest whole number** value of x? C2.4 · AP

- ○ **A** 288
- ○ **B** 48
- ○ **C** 7
- ○ **D** 9

6 Heights in centimetres: **10, 17, 22, 24, 28, 57, 59**
What is the **mean**? D1.5 · TH

- ○ **A** 31
- ○ **B** 24
- ○ **C** 49
- ○ **D** 59

7 Two independent events: a fair spinner with **3** equal sections, and a fair 3-sided die. What is the theoretical probability of getting a **specific** result on both? D2.2 · TH

- ○ **A** 3/3
- ○ **B** 1/9
- ○ **C** 2/9
- ○ **D** 1/6

8 A parallelogram has a base of **9 cm**, a slanted side of **7 cm**, and a perpendicular height of **5 cm**. What is its area? E2.4 · AP

- ○ **A** 22 cm²
- ○ **B** 32 cm²
- ○ **C** 63 cm²
- ○ **D** 45 cm²

9 What is the **order of rotational symmetry** of a **isosceles trapezoid**? E1.1 · KU

- ○ **A** 5
- ○ **B** 1
- ○ **C** 2
- ○ **D** 4

10 Does **setting up an automatic transfer on payday** help or interfere with reaching a financial goal? F1.3 · KU

- ○ **A** it interferes
- ○ **B** it helps
- ○ **C** it makes no difference
- ○ **D** it does both equally

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Week 9

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 A student worked out **7/8 + 1/3 = 8/11**.
What did they do wrong? B2.5 · TH

- ◯ **A** They added the numerators instead of multiplying them
- ◯ **B** They used the wrong common denominator
- ◯ **C** They added the denominators instead of finding a common denominator
- ◯ **D** They forgot to simplify the answer

2 A student wrote the probability of an event as **1.4**. What should it be? B2.1 · TH

- ◯ **A** 0.4 or any value from 0 to 1
- ◯ **B** 14
- ◯ **C** 20
- ◯ **D** 2.1 m

3 The Commission budget is written as **709,971**. Which is the value of the digit in the **ten thousands** place? B1.1 · KU

- ◯ **A** 0
- ◯ **B** 9,000
- ◯ **C** 984
- ◯ **D** 700,000

4 A pattern has the rule **value = 6 × term + 2**. Which **term number** has the value **62**? C2.3 · TH

- ◯ **A** 10
- ◯ **B** 11
- ◯ **C** 60
- ◯ **D** 974

5 Three patterns:
P starts at 2, rule **add 5**
Q starts at 42, rule **subtract 10**
R starts at 11, rule **multiply by 2**
Which number appears in **all three** patterns? C1.3 · TH

- ◯ **A** 32
- ◯ **B** 22
- ◯ **C** 44
- ◯ **D** 27

6 Is **the temperature through the day** discrete or continuous data? D1.1 · KU

- ◯ **A** neither
- ◯ **B** qualitative
- ◯ **C** discrete
- ◯ **D** continuous

7 A rival proposal shows a graph where **the vertical axis starts at 80 instead of 0**. Why is this misleading? D1.6 · TH

- ◯ **A** Choosing which data to leave out can reverse the apparent trend.
- ◯ **B** It exaggerates small differences — the bars look many times taller than each other.
- ◯ **C** Unequal intervals distort the shape of the data.
- ◯ **D** Extra dimensions make some bars look bigger than their value.

8 A planter is a rectangular prism **6 m × 2 m × 3 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces**? E2.6 · TH

- ◯ **A** $216
- ◯ **B** $72
- ◯ **C** 992
- ◯ **D** $108

9 Which statement describes the **diagonals** of a **square**? E1.1 · KU

- ◯ **A** equal and bisect each other, not perpendicular
- ◯ **B** bisect each other only
- ◯ **C** equal, perpendicular, bisect each other
- ◯ **D** perpendicular and bisect each other, not equal

10 Does **having no deadline for the goal** help or interfere with reaching a financial goal? F1.3 · AP

- ◯ **A** it makes no difference
- ◯ **B** it interferes
- ◯ **C** it helps
- ◯ **D** it guarantees failure

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TWELVE WEEKS · WEEK 10 · SHEET 34

Week 10

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 Select the option that is **NOT** equal to **4 tenths**. B1.6 · AP

- **A** 4/10
- **B** 0.4
- **C** 0.04
- **D** 4.0

2 A batch of **240** tiles arrives. **1%** of them are cracked. How many are cracked? B2.3 · AP

- **A** 2.4
- **B** 1
- **C** 24.0
- **D** 4.8

3 A run of decking is **630 cm** long. The plan calls for **8.6** times that length in total. How long is that? B2.7 · AP

- **A** 541.8 cm
- **B** 54180 cm
- **C** 638.6 cm
- **D** 5418 cm

4 Two programs both add **10** to a total **5** times.
Program A writes `add 10 to total` out 5 separate times.
Program B writes `repeat 5 times: add 10 to total`.
Which is more **efficient**, and why? C3.2 · TH

- **A** Program B — it uses a loop, so fewer lines do the same work
- **B** Program A — more lines means more gets done
- **C** Program A — loops always run more slowly
- **D** They are equally efficient because the answer is the same

5 A pattern: **7, 70, 700, 7000, …** What comes next? C1.4 · AP

- **A** 7010
- **B** 70000
- **C** 35000
- **D** 700000

6 Asked for the **median** of **32, 25, 42, 19, 59**, a student answered **42**.
What did they do wrong? D1.5 · TH

- **A** They took the middle of the list without putting the numbers in order first
- **B** They found the mean instead
- **C** They found the range instead
- **D** They found the mode instead

7 Which graph best represents **the mass of every sapling, grouped into the intervals 0–1 kg, 1–2 kg, 2–3 kg**? D1.3 · KU

- **A** histogram
- **B** bar graph
- **C** circle graph
- **D** broken-line graph

8 A trapezoid has parallel sides of **6 cm** and **12 cm** and a height of **10 cm**. What is its area? E2.4 · AP

- **A** 180 cm²
- **B** 30 cm²
- **C** 90 cm²
- **D** 72 cm²

9 A parallelogram has a base of **14 cm**, a slanted side of **11 cm**, and a perpendicular height of **9 cm**. What is its area? E2.4 · AP

- **A** 63 cm²
- **B** 154 cm²
- **C** 126 cm²
- **D** 50 cm²

10 Does **an unexpected repair bill** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it interferes
- **B** it guarantees failure
- **C** it makes no difference
- **D** it helps

Mark against the expectation code, not out of ten. A code missed twice across two weeks is a teaching target; one miss is noise.

TWELVE WEEKS · WEEK 11 · SHEET 35

Week 11

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 The studio orders **6** boxes of **39** brackets, then returns **11** brackets. How many are kept? B2.1 · TH

- **A** 168
- **B** 234
- **C** 245
- **D** 223

2 Write **313 109** in **expanded form.** B1.1 · KU

- **A** 9 × 1 + 1 × 100 + 3 × 1000 + 1 × 10 000 + 3 × 100 000
- **B** 3 × 100 000 + 1 × 10 000 + 3 × 1000 + 1 × 100
- **C** 3 × 100 000 × 1 × 10 000 × 3 × 1000 × 1 × 100 × 9 × 1
- **D** 3 × 100 000 + 1 × 10 000 + 3 × 1000 + 1 × 100 + 9 × 1

3 A student worked out **7 + 6 × 2** and got **26**.
What did they do wrong? B2.1 · TH

- **A** They multiplied before adding
- **B** They added before multiplying
- **C** They used the wrong numbers
- **D** They forgot the brackets in the question

4 Solve for x: **4x + 15 = 75** C2.3 · AP

- **A** 71
- **B** 15
- **C** 30
- **D** 60

5 This code should display **"Correct"** when a whole number is divisible by **9**.

```
input number
if number ______
  then display "Correct"
end
```

Which condition completes it? C3.1 · AP

- **A** is divisible by both 2 and 5
- **B** has a last digit of 0 or 5
- **C** has a digit sum divisible by 9
- **D** has an even last digit

6 What is an **infographic** meant to do with a data set? D1.4 · KU

- **A** replace the need for any titles, labels or sources
- **B** tell a story about the data using graphs, numbers and other relevant information together
- **C** make the data look more impressive than it is
- **D** show every single data value in a long table

7 A tally of paint pots: 6 red · 8 blue · 7 green · 2 yellow.
One pot is taken at random. What is the probability it is **yellow**, in simplest form? D2.1 · TH

- **A** 2/4
- **B** 2/23
- **C** 2/21
- **D** 23/2

8 A parallelogram has base **16 cm**, slanted side **13 cm** and perpendicular height **10 cm**. A student wrote **Area = 16 × 13 = 208 cm²**.
What went wrong? E2.4 · TH

- ◯ **A** They used the slanted side instead of the perpendicular height
- ◯ **B** They multiplied instead of adding
- ◯ **C** They used the wrong units
- ◯ **D** They forgot to divide by 2

9 A planter is a rectangular prism **6 m × 2 m × 3 m**. Sealant covers **1 m² per $5**. What does it cost to seal **all six faces**? E2.6 · TH

- ◯ **A** $180
- ◯ **B** $360
- ◯ **C** $72
- ◯ **D** 367

10 Does **a price rise on the thing you are saving for** help or interfere with reaching a financial goal? F1.3 · AP

- ◯ **A** it interferes
- ◯ **B** it guarantees failure
- ◯ **C** it helps
- ◯ **D** it makes no difference

Mark against the expectation code, not out of ten. A code missed twice across two weeks is a teaching target; one miss is noise.

Week 12

Ten questions in blueprint proportion, drawing on **all three volumes** — three Number, two Algebra, two Data, two Spatial Sense, one Financial Literacy.

> **Twenty minutes a week. Short enough to actually happen, mixed enough that you have to work out what kind of question it is before you start.**

1 The Commission budget is written as **331,209**. Which is the value of the digit in the **ten thousands** place? B1.1 · KU

- **A** 300,000
- **B** 30,000
- **C** 1,000
- **D** 3

2 Which number lies between **2.774** and **2.874**? B1.4 · KU

- **A** 2.674
- **B** 2.904
- **C** 2.754
- **D** 2.824

3 Which number is divisible by **2**? B2.2 · KU

- **A** 946
- **B** 949
- **C** 123
- **D** 947

4 A pattern begins **4, 8, 12, 16, …** Which describes it? C1.1 · KU

- **A** linear growing — it goes up by the same amount each time
- **B** shrinking — it goes down each time
- **C** repeating — the same block comes round again
- **D** non-linear growing — the jump gets bigger each time

5 Simplify **6x + 5x**. C2.1 · KU

- **A** $11x^2$
- **B** 30x
- **C** 11x
- **D** 6x5

6 Which display **lists each value or interval beside how many times it occurred**? D1.3 · KU

- **A** tally table
- **B** frequency table
- **C** histogram
- **D** line plot

7 A fair 4-section spinner has one red section. What is the **theoretical** probability of red? D2.2 · KU

- **A** 1/4
- **B** 19/100
- **C** 1/100
- **D** 4/1

8 The **acute** angle between Line A and Line B is **72°**. What is the angle measuring **counterclockwise** from Line A to Line B? E2.2 · AP

- **A** 252°
- **B** 108°
- **C** 18°
- **D** 288°

9 A trapezoid has parallel sides of **6 cm** and **12 cm** and a height of **4 cm**. What is its area? E2.4 · AP

- **A** 12 cm^2
- **B** 36 cm^2
- **C** 72 cm^2
- **D** 268

10 Does **keeping savings in the same account you spend from** help or interfere with reaching a financial goal? F1.3 · AP

- **A** it guarantees failure
- **B** it helps
- **C** it interferes
- **D** it makes no difference

Mark against the expectation code, not out of ten. A code missed twice across two weeks is a teaching target; one miss is noise.

FULL PAPER · SHEET 37

Mathematics — Full Paper 5

44 questions in 4 stages of 11, to the exact EQAO Junior Division blueprint — drawing on **all three volumes**.

Before you start

Formula sheet and glossary beside you. Calculator and rough paper allowed. No time limit — the real assessment allows additional time for every student.

These papers include the **multi-step Thinking questions** and the **choose-all-that-apply** format from Volume 3, so they are harder than Papers 1 to 4. That is the point.

Strand	Questions	Share
B · Number	14	32%
C · Algebra	9	20%
D · Data	8	18%
E · Spatial Sense	9	20%
F · Financial Literacy	4	9%
Total	**44**	**100%**

Name

.....

Mark by expectation code, not out of 44. List every code missed more than once. That list is the teaching plan — the score is not.

Papers 5 and 6 sample all three volumes. A code never practised will show up here.

PAPER 5 · STAGE 1 · SHEET 38

Paper 5 — Stage 1

Questions 1 to 11. One sitting per stage.

1 A pattern has the rule **value = 4 × term + 1**. Which **term number** has the value **57**? C2.3 · TH

- **A** 14
- **B** 15
- **C** 56
- **D** 533

2 This code should display **"Correct"** when a whole number is divisible by **9**.

```
input number
if number ______
  then display "Correct"
end
```

Which condition completes it? C3.1 · AP

- **A** is divisible by both 2 and 5
- **B** has a digit sum divisible by 9
- **C** has a last digit of 0 or 5
- **D** has an even last digit

3 Which display **stacks an X above each value on a number line, so the shape of the data shows**? D1.3 · KU

- **A** frequency table
- **B** tally table
- **C** line plot
- **D** histogram

4 A parallelogram has base **12 cm**, slanted side **10 cm** and perpendicular height **8 cm**. A student wrote **Area = 12 × 10 = 120 cm²**.

What went wrong? E2.4 · TH

- **A** They used the slanted side instead of the perpendicular height
- **B** They multiplied instead of adding
- **C** They forgot to divide by 2
- **D** They used the wrong units

5 A student worked out **1/3 + 4/8 = 5/11**.

What did they do wrong? B2.5 · TH

- **A** They forgot to simplify the answer
- **B** They added the numerators instead of multiplying them
- **C** They used the wrong common denominator
- **D** They added the denominators instead of finding a common denominator

6 Convert **1500 cm²** to **m²**. E2.1 · AP

- **A** 0.015 m²
- **B** 1.5e+07 m²
- **C** 0.15 m²
- **D** 1.5 m²

7 A bag holds **10** tiles and **5** are cracked. What is the probability of drawing a cracked tile, in **simplest form**? D2.1 · AP

- **A** 10/5
- **B** 1/2
- **C** 5/5
- **D** 5/15

8 A tool costs **$60** and is on sale at **25% off**. What is the sale price? F1.1 · AP

- **A** $35
- **B** $15
- **C** $45
- **D** $75

9 What is the **order of rotational symmetry** of a **square**? E1.1 · KU

- **A** 4
- **B** 2
- **C** 5
- **D** 6

10 Which word means **swapping one thing for another without money changing hands**? F1.5 · KU

- ○ **A** lending
- ○ **B** borrowing
- ○ **C** trading
- ○ **D** donating

11 Does **keeping the savings in a separate account** help or interfere with reaching a financial goal? F1.3 · KU

- ○ **A** it does both equally
- ○ **B** it interferes
- ○ **C** it makes no difference
- ○ **D** it helps

Check before you move on. On the real assessment you can change any answer until you submit the stage.

Paper 5 — Stage 2

Questions 12 to 22. One sitting per stage.

12 A pattern: **1.2, 1.5, 1.8, 2.1, …** What comes next? C1.4 · AP

- ○ **A** 4.2
- ○ **B** 2.4
- ○ **C** 3.1
- ○ **D** 2.7

13 **25%** of the **120** survey replies asked for a green roof. How many replies? B2.12 · AP

- ○ **A** 95
- ○ **B** 30
- ○ **C** 25
- ○ **D** 3.0

14 Estimate the total of **4.27 + 2.62 + 5.78 + 2.31**. B2.3 · TH

- ○ **A** about 30
- ○ **B** about 7
- ○ **C** about 25
- ○ **D** about 15

15 What is an **infographic** meant to do with a data set? D1.4 · KU

- ○ **A** show every single data value in a long table
- ○ **B** make the data look more impressive than it is
- ○ **C** tell a story about the data using graphs, numbers and other relevant information together
- ○ **D** replace the need for any titles, labels or sources

16 A parallelogram has base **12 cm**, slanted side **10 cm** and perpendicular height **8 cm**. A student wrote **Area = 12 × 10 = 120 cm²**.
What went wrong? E2.4 · TH

- ○ **A** They multiplied instead of adding
- ○ **B** They forgot to divide by 2
- ○ **C** They used the wrong units
- ○ **D** They used the slanted side instead of the perpendicular height

17 A tally of paint pots: 8 red · 6 blue · 7 green · 6 yellow.
One pot is taken at random. What is the probability it is **green**, in simplest form? D2.1 · TH

- ○ **A** 7/4
- ○ **B** 27/7
- ○ **C** 7/27
- ○ **D** 7/20

18 Which list of fractions is in order from **smallest to largest**? B1.3 · AP

- ○ **A** 545
- ○ **B** 1/3, 2/5, 1/2, 2/3
- ○ **C** 1/2, 1/3, 2/3, 2/5
- ○ **D** 2/3, 1/2, 2/5, 1/3

19 Select **every** prime number. B2.6 · KU

Select **all** that apply.

- ☐ **A** 57
- ☐ **B** 27
- ☐ **C** 17
- ☐ **D** 49
- ☐ **E** 37

20 **2/3** of the **33** saplings ordered are maple. How many are maple? B2.9 · AP

- ○ **A** 11
- ○ **B** 49
- ○ **C** 22
- ○ **D** 30

21 Three patterns:
P starts at 2, rule **add 6**
Q starts at 78, rule **subtract 10**
R starts at 19, rule **multiply by 2**
Which number appears in **all three** patterns? C1.3 · TH

- ○ **A** 76
- ○ **B** 68
- ○ **C** 38
- ○ **D** 44

22 Which graph best represents **the number of votes for each of five different designs**? D1.3 · KU

- ○ **A** broken-line graph
- ○ **B** circle graph
- ○ **C** bar graph
- ○ **D** histogram

Check before you move on. On the real assessment you can change any answer until you submit the stage.

Paper 5 — Stage 3

Questions 23 to 33. One sitting per stage.

23 **36** planters are ordered. **3/6** of them are cedar. How many are cedar? B2.9 · AP

- **A** 30
- **B** 72
- **C** 12.0
- **D** 18

24 A stem-and-leaf plot shows:
3 | 1 2 5 8
What is the **median**? D1.3 · AP

- **A** 31
- **B** 30
- **C** 33.5
- **D** 38

25 A pattern starts at **5** with the rule **add 4**. Asked for the **5th** term, a student wrote **9**.
What did they do wrong? C1.3 · TH

- **A** They used the wrong starting number
- **B** They applied the rule once instead of 4 times
- **C** They subtracted instead of adding
- **D** They applied the rule 5 times instead of 4

26 A batch of **500** tiles arrives. **50%** of them are cracked. How many are cracked? B2.3 · AP

- **A** 50
- **B** 500.0
- **C** 25
- **D** 250

27 Evaluate **8x + 5** when **x = 1.2**. C2.2 · AP

- **A** 14.6
- **B** 4.6
- **C** 49.6
- **D** 14.2

28 Convert **3200 m** to **km**. E2.1 · AP

- **A** 3.2 km
- **B** 0.32 km
- **C** 3.2e+06 km
- **D** 32 km

29 Heights in centimetres: **18, 35, 39, 42, 51, 53, 56**
What is the **mean**? D1.5 · TH

- **A** 42
- **B** 18
- **C** 56
- **D** 38

30 Is **91** a prime number or a composite number? B2.6 · KU

- **A** neither
- **B** prime
- **C** composite
- **D** both

31 Which shape has **exactly 2** lines of symmetry? E1.1 · KU

- **A** rhombus
- **B** kite
- **C** parallelogram
- **D** square

32 The studio orders **4** boxes of **15** brackets, then returns **20** brackets. How many are kept? B2.1 · TH

- **A** -20
- **B** 40
- **C** 80
- **D** 60

33 What is the **order of rotational symmetry** of a **square**? E1.1 · KU

- **A** 2
- **B** 4
- **C** 6
- **D** 5

Check before you move on. On the real assessment you can change any answer until you submit the stage.

Paper 5 — Stage 4

Questions 34 to 44. One sitting per stage.

34
```
set total to 2
repeat 5 times
  increase total by 10
end repeat
```
What is **total** at the end? C3.2 · AP

- **A** 50
- **B** 12
- **C** 52
- **D** 20

35 On a vertical number line, the basement floor is at **-3** and the roof deck is at **11**. How many units apart are they? B1.2 · AP

- **A** 8
- **B** -8
- **C** 16
- **D** 14

36 Which number lies between **5.573** and **5.673**? B1.4 · KU

- **A** 5.473
- **B** 5.703
- **C** 5.623
- **D** 5.553

37 Which number is divisible by **8**? B2.2 · KU

- **A** 244
- **B** 241
- **C** 240
- **D** 247

38 Asked for the **median** of **37, 43, 40, 23, 36**, a student answered **40**.
What did they do wrong? D1.5 · TH

- **A** They took the middle of the list without putting the numbers in order first
- **B** They found the range instead
- **C** They found the mean instead
- **D** They found the mode instead

39 Which shape has **exactly 4** lines of symmetry? E1.1 · KU

- **A** rectangle
- **B** isosceles trapezoid
- **C** square
- **D** rhombus

40 A run of decking is **726 cm** long. The plan calls for **7.2** times that length in total. How long is that? B2.7 · AP

- **A** 733.2 cm
- **B** 52272 cm
- **C** 5227.2 cm
- **D** 522.72 cm

41 Solve the inequality **2x + 8 < 20**. What is the **greatest whole number** value of x? C2.4 · AP

- **A** 5
- **B** 7
- **C** 12
- **D** 24

42 A planter is a rectangular prism **3 cm × 4 cm × 7 cm**. What is its **surface area**? E2.6 · AP

- **A** 28 cm^2
- **B** 122 cm^2
- **C** 84 cm^3
- **D** 61 cm^2

43 **You swap two of your cards for one of theirs.** What is this? F1.5 · KU

- **A** lending
- **B** borrowing
- **C** donating
- **D** trading

44 Simplify **3x + 7x**. C2.1 · KU

- **A** 10x
- **B** 3x7
- **C** 21x
- **D** $10x^2$

Check before you move on. On the real assessment you can change any answer until you submit the stage.

FULL PAPER · SHEET 42

Mathematics — Full Paper 6

44 questions in 4 stages of 11, to the exact EQAO Junior Division blueprint — drawing on **all three volumes**.

Before you start

Formula sheet and glossary beside you. Calculator and rough paper allowed. No time limit — the real assessment allows additional time for every student.

These papers include the **multi-step Thinking questions** and the **choose-all-that-apply** format from Volume 3, so they are harder than Papers 1 to 4. That is the point.

Strand	Questions	Share
B · Number	14	32%
C · Algebra	9	20%
D · Data	8	18%
E · Spatial Sense	9	20%
F · Financial Literacy	4	9%
Total	**44**	**100%**

Name

Mark by expectation code, not out of 44. List every code missed more than once. That list is the teaching plan — the score is not.

Papers 5 and 6 sample all three volumes. A code never practised will show up here.

Paper 6 — Stage 1

Questions 1 to 11. One sitting per stage.

1 **Without working it out exactly**, roughly what is **145 ÷ 4**? B2.3 · TH

- **A** about 141
- **B** about 18
- **C** about 36
- **D** about 144

2 Solve the inequality **3x + 4 < 19**. What is the **greatest whole number** value of x? C2.4 · AP

- **A** 45
- **B** 15
- **C** 4
- **D** 6

3 Which term means **charges a bank or service makes for using an account or a card**? F1.2 · KU

- **A** interest earned
- **B** income
- **C** fees
- **D** budget

4 A point moves from **(4, 8)** to **(4, 13)**. Describe the translation. E1.3 · AP

- **A** 740
- **B** 5 right
- **C** 5 dow
- **D** 5 up

5 Two lengths of cedar measure **59.96 m** and **4.91 m**. What is the difference? B2.4 · AP

- **A** 64.87
- **B** 550.50
- **C** 55.05
- **D** 55.15

6 What is an **infographic** meant to do with a data set? D1.4 · KU

- **A** replace the need for any titles, labels or sources
- **B** show every single data value in a long table
- **C** make the data look more impressive than it is
- **D** tell a story about the data using graphs, numbers and other relevant information together

7 Write **967 465** in **expanded form**. B1.1 · KU

- **A** 9 × 100 000 × 6 × 10 000 × 7 × 1000 × 4 × 100 × 6 × 10 × 5 × 1
- **B** 9 × 100 000 + 6 × 10 000 + 7 × 1000 + 4 × 100 + 6 × 10
- **C** 5 × 1 + 6 × 10 + 4 × 100 + 7 × 1000 + 6 × 10 000 + 9 × 100 000
- **D** 9 × 100 000 + 6 × 10 000 + 7 × 1000 + 4 × 100 + 6 × 10 + 5 × 1

8 Four term values of a growing pattern are shown.
Term number: 3 · 5 · 7 · ?
Term value: 14 · 22 · 30 · 62
What is the **term number** when the term value is 62? C1.3 · AP

- **A** 47
- **B** 17
- **C** 15
- **D** 62

9 Is **11** a prime number or a composite number? B2.6 · KU

- **A** neither
- **B** composite
- **C** prime
- **D** both

10 A point moves from **(-3, -1)** to **(-3, -2)**. Describe the translation. E1.3 · AP

- **A** 1 up
- **B** 1 down
- **C** 1 left
- **D** 1 right

11 A planter is a rectangular prism **5 m × 4 m × 3 m**. Sealant covers **1 m² per $2**. What does it cost to seal **all six faces**? E2.6 · TH

- **A** $120
- **B** $188
- **C** 900
- **D** $94

Check before you move on. On the real assessment you can change any answer until you submit the stage.

Paper 6 — Stage 2

Questions 12 to 22. One sitting per stage.

12 A pattern starts at **4** and the rule is **add 2**. Which pair belongs in its table of values? C1.2 · AP

- **A** (9, 22)
- **B** (9, 18)
- **C** (9, 20)
- **D** (20, 9)

13 You need to **borrow $2000** for 1 year. One lender charges **5%** simple interest, another charges **2%**. Which costs less, and by how much? F1.4 · TH

- **A** 2%, by $60
- **B** 5%, by $60
- **C** 2%, by $3
- **D** They cost the same

14 A shape undergoes **a translation 3 right then a reflection in the y-axis**. What is the result? E1.4 · TH

- **A** the same result as a single reflection in the x-axis
- **B** the shape is on the other side, 3 units from where it started
- **C** the shape is back exactly where it started
- **D** the shape has been enlarged

15 A student measured a classroom door and wrote **2.1 km**. What should it be? B2.1 · TH

- **A** 14
- **B** 20
- **C** 2.1 m
- **D** 20 cm²

16 A run of decking is **676 cm** long. The plan calls for **5.0** times that length in total. How long is that? B2.7 · AP

- **A** 33800 cm
- **B** 681 cm
- **C** 338 cm
- **D** 3380 cm

17 A 2-sided spinner is spun **20** times and lands on red **10** times. What is the **experimental** probability of red? D2.2 · AP

- **A** 10/20
- **B** 10/2
- **C** 20/10
- **D** 1/2

18 Which graph best represents **the number of votes for each of five different designs**? D1.3 · KU

- **A** broken-line graph
- **B** bar graph
- **C** histogram
- **D** circle graph

19 **47.427 kg** of fixings is shared equally between **2** crates. How much per crate? B2.11 · AP

- **A** 23.7135 kg
- **B** 94.854 kg
- **C** 45.427 kg
- **D** 237.135 kg

20 On a vertical number line, the basement floor is at **-3** and the roof deck is at **12**. How many units apart are they? B1.2 · AP

- **A** 15
- **B** -9
- **C** 9
- **D** 17

21 Two programs both add **10** to a total **4** times.
Program A writes `add 10 to total` out 4 separate times.
Program B writes `repeat 4 times: add 10 to total`.
Which is more **efficient**, and why? C3.2 · TH

- **A** Program A — more lines means more gets done
- **B** Program A — loops always run more slowly
- **C** Program B — it uses a loop, so fewer lines do the same work
- **D** They are equally efficient because the answer is the same

22 Heights in centimetres: **12, 13, 20, 31, 33, 38, 42**
What is the **mean**? D1.5 · TH

- ○ **A** 30
- ○ **B** 31
- ○ **C** 27
- ○ **D** 42

Check before you move on. On the real assessment you can change any answer until you submit the stage.

Paper 6 — Stage 3

Questions 23 to 33. One sitting per stage.

23 Which statement describes a **debit card**? F1.1 · KU

- ◯ **A** takes the money straight from your own bank account
- ◯ **B** moves money between accounts electronically, usually with a fee or a limit
- ◯ **C** often charges a high interest rate on any unpaid balance
- ◯ **D** cannot be traced or reversed if it is lost

24 A rectangle of decking measures **18 cm by 10 cm**. A rectangular notch measuring **3 cm by 7 cm** is cut out of one corner. What is the remaining area? E2.4 · TH

- ◯ **A** 180 cm²
- ◯ **B** 159 cm²
- ◯ **C** 170 cm²
- ◯ **D** 201 cm²

25 Which number is divisible by **6**? B2.2 · KU

- ◯ **A** 821
- ◯ **B** 816
- ◯ **C** 819
- ◯ **D** 817

26 A tally of paint pots: 6 red · 4 blue · 3 green · 8 yellow.
One pot is taken at random. What is the probability it is **red**, in simplest form? D2.1 · TH

- ◯ **A** 6/15
- ◯ **B** 2/7
- ◯ **C** 21/6
- ◯ **D** 6/4

27 A student worked out **1/2 + 2/8 = 3/10**.
What did they do wrong? B2.5 · TH

- ◯ **A** They used the wrong common denominator
- ◯ **B** They added the numerators instead of multiplying them
- ◯ **C** They added the denominators instead of finding a common denominator
- ◯ **D** They forgot to simplify the answer

28 **An unexpected repair bill arriving** — what is this? F1.2 · KU

- ◯ **A** a step that helps reach a goal
- ◯ **B** a factor that interferes with a goal
- ◯ **C** a saving goal
- ◯ **D** an earning goal

29 Solve for x: **3x + 6 = 15** C2.3 · AP

- ◯ **A** 12
- ◯ **B** 9
- ◯ **C** 3
- ◯ **D** 5

30 Two independent events: a fair spinner with **2** equal sections, and a fair coin. What is the theoretical probability of getting a **specific** result on both? D2.2 · TH

- ◯ **A** 2/4
- ◯ **B** 913
- ◯ **C** 2/2
- ◯ **D** 1/4

31 A bag holds **20** tiles and **6** are cracked. What is the probability of drawing a cracked tile, in **simplest form**? D2.1 · AP

- ◯ **A** 6/26
- ◯ **B** 3/10
- ◯ **C** 6/14
- ◯ **D** 20/6

32 A shape undergoes **a reflection in the y-axis then a rotation of 180° about the origin**. What is the result? E1.4 · TH

- ○ **A** the same result as a single reflection in the x-axis
- ○ **B** the shape is back exactly where it started
- ○ **C** the shape is on the other side, 3 units from where it started
- ○ **D** the shape has been enlarged

33 Round **14.598** to the nearest **hundredth**. B1.5 · KU

- ○ **A** 15
- ○ **B** 14.61
- ○ **C** 14.60
- ○ **D** 14.5

Check before you move on. On the real assessment you can change any answer until you submit the stage.

Paper 6 — Stage 4

Questions 34 to 44. One sitting per stage.

34
```
set total to 3
repeat 5 times
  add 2 to total
end repeat
```
The **5** is changed to **6**. What is the new total? C3.2 · AP

- **A** 12
- **B** 17
- **C** 13
- **D** 15

35 A **kite** has diagonals of **18 cm** and **12 cm**. What is its area? E2.4 · AP

- **A** 108 cm²
- **B** 60 cm²
- **C** 216 cm²
- **D** 30 cm²

36 A rectangle of decking measures **20 cm by 14 cm**. A rectangular notch measuring **3 cm by 7 cm** is cut out of one corner. What is the remaining area? E2.4 · TH

- **A** 259 cm²
- **B** 270 cm²
- **C** 280 cm²
- **D** 301 cm²

37 Which display **records each observation with a stroke, grouped in fives**? D1.3 · KU

- **A** histogram
- **B** frequency table
- **C** line plot
- **D** tally table

38 Which list of fractions is in order from **smallest to largest**? B1.3 · AP

- **A** 129
- **B** 5/6, 3/4, 1/3, 1/4
- **C** 1/3, 1/4, 3/4, 5/6
- **D** 1/4, 1/3, 3/4, 5/6

39 Order these from **least to greatest**: **−3 · −1 · −1/2 · 2** B1.3 · AP

- **A** −3, −1, −1/2, 2
- **B** −1/2, −1, 2, −3
- **C** 2, −1, −1/2, −3
- **D** 2, −1/2, −1, −3

40 A pattern begins **8, 14, 20, 26, …** Which describes it? C1.1 · KU

- **A** non-linear growing — the jump gets bigger each time
- **B** repeating — the same block comes round again
- **C** shrinking — it goes down each time
- **D** linear growing — it goes up by the same amount each time

41 The studio orders **4** boxes of **28** brackets, then returns **27** brackets. How many are kept? B2.1 · TH

- **A** 112
- **B** 4
- **C** 139
- **D** 85

42 Three patterns:
P starts at 2, rule **add 5**
Q starts at 52, rule **subtract 10**
R starts at 2, rule **multiply by 2**
Which number appears in **all three** patterns? C1.3 · TH

- **A** 37
- **B** 4
- **C** 32
- **D** 42

43 In which equation does **p** have the **greatest** value?

A 45 + p = 89

B 44 + p = 90

C 4p = 136

D 76 − p = 41 C2.3 · TH

- ◯ **A** 45 + p = 89
- ◯ **B** 44 + p = 90
- ◯ **C** 76 − p = 41
- ◯ **D** 4p = 136

44 A planter is a rectangular prism **5 m × 4 m × 3 m**. Sealant covers **1 m² per $3**. What does it cost to seal **all six faces**? E2.6 · TH

- ◯ **A** $282
- ◯ **B** $94
- ◯ **C** $180
- ◯ **D** $141

Check before you move on. On the real assessment you can change any answer until you submit the stage.

Answers

Read the reason even on the ones you got right — on the Thinking sheets the method is the whole point.

Sheet 3

1 A — (12, 26) [C1.2] · Term 12 has value 2 × 12 + 2 = 26. The pair is written (term number, term value) — in that order.

2 A — (7, 19) [C1.2] · Term 7 has value 2 × 7 + 5 = 19. The pair is written (term number, term value) — in that order.

3 C — a straight line going up to the right [C1.2] · A constant increase of 3 plots as a straight line. A pattern whose jump changes would curve. This is what makes it a **linear** growing pattern.

4 B — multiply the term number by 7, then add 6 [C1.2] · The term value rises 7 each time the term number rises 1, so the multiplier is 7. At term 1 the value is 13, so the constant is 6. Value = 7 × term + 6.

5 D — a straight line going up to the right [C1.2] · A constant increase of 6 plots as a straight line. A pattern whose jump changes would curve. This is what makes it a **linear** growing pattern.

6 A — (9, 70) [C1.2] · Term 9 has value 7 × 9 + 7 = 70. The pair is written (term number, term value) — in that order.

7 D — (6, 25) [C1.2] · Term 6 has value 3 × 6 + 7 = 25. The pair is written (term number, term value) — in that order.

8 D — (10, 44) [C1.2] · Term 10 has value 4 × 10 + 4 = 44. The pair is written (term number, term value) — in that order.

9 A — multiply the term number by 4, then add 7 [C1.2] · The term value rises 4 each time the term number rises 1, so the multiplier is 4. At term 1 the value is 11, so the constant is 7. Value = 4 × term + 7.

10 D — (11, 30) [C1.2] · Term 11 has value 2 × 11 + 8 = 30. The pair is written (term number, term value) — in that order.

11 A — a straight line going up to the right [C1.2] · A constant increase of 3 plots as a straight line. A pattern whose jump changes would curve. This is what makes it a **linear** growing pattern.

12 A — (8, 62) [C1.2] · Term 8 has value 7 × 8 + 6 = 62. The pair is written (term number, term value) — in that order.

Sheet 4

1 C — 4.5 [C1.4] · The rule is add 0.5 each time. Line the decimals up before adding — the pattern is showing how decimals build in equal steps.

2 A — 70000 [C1.4] · Each term is 10 times the one before, so the digits stay the same and the decimal point moves one place right each time.

3 A — 120000 [C1.4] · Each term is 10 times the one before, so the digits stay the same and the decimal point moves one place right each time.

4 B — 25000 [C1.4] · Each term is 10 times the one before, so the digits stay the same and the decimal point moves one place right each time.

5 D — 1.5 [C1.4] · The rule is add 0.25 each time. Line the decimals up before adding — the pattern is showing how decimals build in equal steps.

6 C — 5 [C1.4] · Each term is half the one before. Halving a whole number can produce a decimal — that is the relationship the pattern is showing.

7 D — 20 [C1.4] · Each term is half the one before. Halving a whole number can produce a decimal — that is the relationship the pattern is showing.

8 C — 70000 [C1.4] · Each term is 10 times the one before, so the digits stay the same and the decimal point moves one place right each time.

9 A — 1.5 [C1.4] · The rule is add 0.25 each time. Line the decimals up before adding — the pattern is showing how decimals build in equal steps.

10 D — 4.5 [C1.4] · The rule is add 0.5 each time. Line the decimals up before adding — the pattern is showing how decimals build in equal steps.

11 A — 10 [C1.4] · Each term is half the one before. Halving a whole number can produce a decimal — that is the relationship the pattern is showing.

12 D — 6000 [C1.4] · Each term is 10 times the one before, so the digits stay the same and the decimal point moves one place right each time.

Sheet 5

1 A — 4 [E2.5] · A net has one shape for every face. A triangular pyramid has 4 faces — four triangles.

2 C — 7 [E2.5] · A net has one shape for every face. A pentagonal prism has 7 faces — two pentagons and five rectangles.

3 A — 5 [E2.5] · A net has one shape for every face. A triangular prism has 5 faces — two triangles and three rectangles.

4 B — pentagonal prism [E2.5] · Count the shapes in the net and match them to the faces. A pentagonal prism has 7 faces: two pentagons and five rectangles.

5 D — cube [E2.5] · Count the shapes in the net and match them to the faces. A cube has 6 faces: six squares.

6 B — triangular prism [E2.5] · Count the shapes in the net and match them to the faces. A triangular prism has 5 faces: two triangles and three rectangles.

7 A — 6 [E2.5] · A net has one shape for every face. A rectangular prism has 6 faces — six rectangles in three matching pairs.

8 A — cube [E2.5] · Count the shapes in the net and match them to the faces. A cube has 6 faces: six squares.

9 D — pentagonal prism [E2.5] · Count the shapes in the net and match them to the faces. A pentagonal prism has 7 faces: two pentagons and five rectangles.

10 C — pentagonal prism [E2.5] · Count the shapes in the net and match them to the faces. A pentagonal prism has 7 faces: two pentagons and five rectangles.

11 B — 4 [E2.5] · A net has one shape for every face. A triangular pyramid has 4 faces — four triangles.

12 D — pentagonal prism [E2.5] · Count the shapes in the net and match them to the faces. A pentagonal prism has 7 faces: two pentagons and five rectangles.

Answers, continued

Sheet 6

1 D — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

2 C — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

3 D — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

4 A — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

5 B — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

6 D — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

7 B — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

8 D — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

9 A — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

10 B — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

11 C — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

12 D — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

Sheet 7

1 A — 20 [B2.9] · Multiplying by 4/5: divide 25 by 5 (= 5), then multiply by 4 = 20.

2 D — 16 [B2.9] · Multiplying by 1/2: divide 32 by 2 (= 16), then multiply by 1 = 16.

3 C — 25 [B2.9] · Multiplying by 1/2: divide 50 by 2 (= 25), then multiply by 1 = 25.

4 D — 40 [B2.9] · Multiplying by 5/6: divide 48 by 6 (= 8), then multiply by 5 = 40.

5 A — 16 [B2.9] · Multiplying by 2/4: divide 32 by 4 (= 8), then multiply by 2 = 16.

6 C — 12 [B2.9] · Multiplying by 1/3: divide 36 by 3 (= 12), then multiply by 1 = 12.

7 C — 30 [B2.9] · Multiplying by 2/3: divide 45 by 3 (= 15), then multiply by 2 = 30.

8 A — 14 [B2.9] · Multiplying by 4/6: divide 21 by 6 (= 3), then multiply by 4 = 14.

9 D — 18 [B2.9] · Multiplying by 2/5: divide 45 by 5 (= 9), then multiply by 2 = 18.

10 A — 34 [B2.9] · Multiplying by 4/6: divide 51 by 6 (= 8), then multiply by 4 = 34.

11 B — 10 [B2.9] · Multiplying by 1/2: divide 20 by 2 (= 10), then multiply by 1 = 10.

12 C — 14 [B2.9] · Multiplying by 2/3: divide 21 by 3 (= 7), then multiply by 2 = 14.

Sheet 8

1 B — trading [F1.5] · This is trading. The four differ in whether money moves, whether it comes back, and who owes whom.

2 A — borrowing [F1.5] · This is borrowing. The four differ in whether money moves, whether it comes back, and who owes whom.

3 C — trading [F1.5] · This is trading. The four differ in whether money moves, whether it comes back, and who owes whom.

4 A — borrowing [F1.5] · This is borrowing. The four differ in whether money moves, whether it comes back, and who owes whom.

5 A — donating [F1.5] · This is donating. The four differ in whether money moves, whether it comes back, and who owes whom.

6 A — trading [F1.5] · This is trading. The four differ in whether money moves, whether it comes back, and who owes whom.

7 D — borrowing [F1.5] · This is borrowing. The four differ in whether money moves, whether it comes back, and who owes whom.

8 A — trading [F1.5] · This is trading. The four differ in whether money moves, whether it comes back, and who owes whom.

9 A — lending [F1.5] · This is lending. The four differ in whether money moves, whether it comes back, and who owes whom.

10 D — trading [F1.5] · This is trading. The four differ in whether money moves, whether it comes back, and who owes whom.

11 A — borrowing [F1.5] · This is borrowing. The four differ in whether money moves, whether it comes back, and who owes whom.

12 C — borrowing [F1.5] · This is borrowing. The four differ in whether money moves, whether it comes back, and who owes whom.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 9

1 D — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 15 first: the correct answer is 22/15.

2 C — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 15 first: the correct answer is 22/15.

3 D — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 12 first: the correct answer is 13/12.

4 C — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 12 first: the correct answer is 14/12.

5 A — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 4 first: the correct answer is 3/4.

6 D — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 12 first: the correct answer is 12/12.

7 A — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 8 first: the correct answer is 8/8.

8 A — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 4 first: the correct answer is 5/4.

9 D — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 24 first: the correct answer is 10/24.

10 A — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 6 first: the correct answer is 5/6.

11 C — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 6 first: the correct answer is 5/6.

12 D — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 12 first: the correct answer is 14/12.

Sheet 10

1 C — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (8), never the slant (10). The correct area is 12 × 8 = 96 cm².

2 B — They forgot to divide by 2 [E2.4] · A triangle is half a rectangle: 16 × 10 ÷ 2 = 80 cm². The formula sheet shows the ÷ 2.

3 A — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (6), never the slant (8). The correct area is 10 × 6 = 60 cm².

4 B — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (6), never the slant (8). The correct area is 10 × 6 = 60 cm².

5 C — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (10), never the slant (13). The correct area is 16 × 10 = 160 cm².

6 C — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (6), never the slant (8). The correct area is 10 × 6 = 60 cm².

7 A — They forgot to divide by 2 [E2.4] · A triangle is half a rectangle: 16 × 10 ÷ 2 = 80 cm². The formula sheet shows the ÷ 2.

8 C — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (10), never the slant (13). The correct area is 16 × 10 = 160 cm².

9 B — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (6), never the slant (8). The correct area is 10 × 6 = 60 cm².

10 D — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (6), never the slant (8). The correct area is 10 × 6 = 60 cm².

11 C — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (6), never the slant (8). The correct area is 10 × 6 = 60 cm².

12 C — They forgot to divide by 2 [E2.4] · A triangle is half a rectangle: 12 × 8 ÷ 2 = 48 cm². The formula sheet shows the ÷ 2.

Sheet 11

1 C — They added before multiplying [B2.1] · Multiplication comes before addition. 3 × 2 = 6, then + 3 = 9. Their answer 12 is what (3 + 3) × 2 would give.

2 D — They added before multiplying [B2.1] · Multiplication comes before addition. 4 × 7 = 28, then + 8 = 36. Their answer 84 is what (8 + 4) × 7 would give.

3 C — They added before multiplying [B2.1] · Multiplication comes before addition. 8 × 7 = 56, then + 4 = 60. Their answer 84 is what (4 + 8) × 7 would give.

4	B — They added before multiplying [B2.1] · Multiplication comes before addition. 2 × 4 = 8, then + 8 = 16. Their answer 40 is what (8 + 2) × 4 would give.
5	A — They added before multiplying [B2.1] · Multiplication comes before addition. 4 × 7 = 28, then + 7 = 35. Their answer 77 is what (7 + 4) × 7 would give.
6	B — They added before multiplying [B2.1] · Multiplication comes before addition. 5 × 5 = 25, then + 3 = 28. Their answer 40 is what (3 + 5) × 5 would give.
7	A — They added before multiplying [B2.1] · Multiplication comes before addition. 7 × 5 = 35, then + 6 = 41. Their answer 65 is what (6 + 7) × 5 would give.
8	B — They added before multiplying [B2.1] · Multiplication comes before addition. 8 × 5 = 40, then + 2 = 42. Their answer 50 is what (2 + 8) × 5 would give.
9	B — They added before multiplying [B2.1] · Multiplication comes before addition. 9 × 4 = 36, then + 7 = 43. Their answer 64 is what (7 + 9) × 4 would give.
10	A — They added before multiplying [B2.1] · Multiplication comes before addition. 4 × 9 = 36, then + 6 = 42. Their answer 90 is what (6 + 4) × 9 would give.
11	A — They added before multiplying [B2.1] · Multiplication comes before addition. 3 × 4 = 12, then + 8 = 20. Their answer 44 is what (8 + 3) × 4 would give.
12	A — They added before multiplying [B2.1] · Multiplication comes before addition. 6 × 2 = 12, then + 5 = 17. Their answer 22 is what (5 + 6) × 2 would give.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 12

1 D — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 12 + (4 × 7) = 40. Applying a rule once and then guessing is the single most common pattern error.

2 D — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 11 + (4 × 6) = 35. Applying a rule once and then guessing is the single most common pattern error.

3 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 4 + (4 × 7) = 32. Applying a rule once and then guessing is the single most common pattern error.

4 C — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 10 + (4 × 4) = 26. Applying a rule once and then guessing is the single most common pattern error.

5 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 3 + (4 × 6) = 27. Applying a rule once and then guessing is the single most common pattern error.

6 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 4 + (4 × 7) = 32. Applying a rule once and then guessing is the single most common pattern error.

7 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 10 + (4 × 4) = 26. Applying a rule once and then guessing is the single most common pattern error.

8 A — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 11 + (4 × 5) = 31. Applying a rule once and then guessing is the single most common pattern error.

9 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 6 + (4 × 6) = 30. Applying a rule once and then guessing is the single most common pattern error.

10 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 8 + (4 × 4) = 24. Applying a rule once and then guessing is the single most common pattern error.

11 C — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 4 + (4 × 6) = 28. Applying a rule once and then guessing is the single most common pattern error.

12 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 11 + (4 × 7) = 39. Applying a rule once and then guessing is the single most common pattern error.

Sheet 13

1 D — They gave the discount instead of the sale price [F1.1] · $8 is the discount. The sale price is $80 − $8 = $72. Always read what the question actually asks for.

2 D — They gave the discount instead of the sale price [F1.1] · $4 is the discount. The sale price is $40 − $4 = $36. Always read what the question actually asks for.

3 B — They gave the discount instead of the sale price [F1.1] · $20 is the discount. The sale price is $200 − $20 = $180. Always read what the question actually asks for.

4 B — They gave the discount instead of the sale price [F1.1] · $60 is the discount. The sale price is $120 − $60 = $60. Always read what the question actually asks for.

5 B — They gave the discount instead of the sale price [F1.1] · $12 is the discount. The sale price is $60 − $12 = $48. Always read what the question actually asks for.

6 C — They gave the discount instead of the sale price [F1.1] · $100 is the discount. The sale price is $200 − $100 = $100. Always read what the question actually asks for.

7 B — They gave the discount instead of the sale price [F1.1] · $100 is the discount. The sale price is $200 − $100 = $100. Always read what the question actually asks for.

8 D — They gave the discount instead of the sale price [F1.1] · $100 is the discount. The sale price is $200 − $100 = $100. Always read what the question actually asks for.

9 B — They gave the discount instead of the sale price [F1.1] · $24 is the discount. The sale price is $120 − $24 = $96. Always read what the question actually asks for.

10 A — They gave the discount instead of the sale price [F1.1] · $8 is the discount. The sale price is $80 − $8 = $72. Always read what the question actually asks for.

11 B — They gave the discount instead of the sale price [F1.1] · $100 is the discount. The sale price is $200 − $100 = $100. Always read what the question actually asks for.

12 B — They gave the discount instead of the sale price [F1.1] · $30 is the discount. The sale price is $120 − $30 = $90. Always read what the question actually asks for.

Sheet 14

1 C — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 25, 31, 43, 49, 56. The middle value is 43. A median only means anything once the data is sorted.

2	A — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 13, 34, 46, 50, 58. The middle value is 46. A median only means anything once the data is sorted.
3	A — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 19, 29, 40, 46, 52. The middle value is 40. A median only means anything once the data is sorted.
4	A — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 11, 33, 45, 53, 56. The middle value is 45. A median only means anything once the data is sorted.
5	D — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 16, 24, 44, 48, 55. The middle value is 44. A median only means anything once the data is sorted.
6	C — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 20, 43, 48, 50, 58. The middle value is 48. A median only means anything once the data is sorted.
7	C — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 27, 32, 34, 38, 42. The middle value is 34. A median only means anything once the data is sorted.
8	B — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 14, 15, 26, 41, 54. The middle value is 26. A median only means anything once the data is sorted.
9	A — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 11, 13, 14, 42, 43. The middle value is 14. A median only means anything once the data is sorted.
10	A — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 13, 35, 38, 41, 50. The middle value is 38. A median only means anything once the data is sorted.
11	C — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 12, 15, 18, 27, 55. The middle value is 18. A median only means anything once the data is sorted.
12	C — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 19, 30, 31, 32, 57. The middle value is 31. A median only means anything once the data is sorted.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 15

1 A — $108 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $3 = $144. Discount = 25% of $144 = $36, so final = $108. Stopping at $144 is the trap.

2 A — $162 [E2.4] · Three steps. Area = 9 × 8 = 72 m². Cost = 72 × $3 = $216. Discount = 25% of $216 = $54, so final = $162. Stopping at $216 is the trap.

3 D — $108 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $3 = $144. Discount = 25% of $144 = $36, so final = $108. Stopping at $144 is the trap.

4 C — $270 [E2.4] · Three steps. Area = 9 × 8 = 72 m². Cost = 72 × $5 = $360. Discount = 25% of $360 = $90, so final = $270. Stopping at $360 is the trap.

5 A — $216 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $6 = $288. Discount = 25% of $288 = $72, so final = $216. Stopping at $288 is the trap.

6 A — $192 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $5 = $240. Discount = 20% of $240 = $48, so final = $192. Stopping at $240 is the trap.

7 B — $260 [E2.4] · Three steps. Area = 12 × 4 = 48 m². Cost = 48 × $6 = $288. Discount = 10% of $288 = $28, so final = $260. Stopping at $288 is the trap.

8 D — $192 [E2.4] · Three steps. Area = 12 × 4 = 48 m². Cost = 48 × $5 = $240. Discount = 20% of $240 = $48, so final = $192. Stopping at $240 is the trap.

9 C — $135 [E2.4] · Three steps. Area = 10 × 5 = 50 m². Cost = 50 × $3 = $150. Discount = 10% of $150 = $15, so final = $135. Stopping at $150 is the trap.

10 B — $116 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $3 = $144. Discount = 20% of $144 = $28, so final = $116. Stopping at $144 is the trap.

11 A — $192 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $5 = $240. Discount = 20% of $240 = $48, so final = $192. Stopping at $240 is the trap.

12 D — $260 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $6 = $288. Discount = 10% of $288 = $28, so final = $260. Stopping at $288 is the trap.

Sheet 16

1 C — 6/17 [D2.1] · Two steps. Total = 17. Probability = 6/17, which simplifies to 6/17. You have to build the total from the data before you can write the probability.

2 A — 5/27 [D2.1] · Two steps. Total = 27. Probability = 5/27, which simplifies to 5/27. You have to build the total from the data before you can write the probability.

3 D — 5/17 [D2.1] · Two steps. Total = 17. Probability = 5/17, which simplifies to 5/17. You have to build the total from the data before you can write the probability.

4 D — 4/17 [D2.1] · Two steps. Total = 17. Probability = 4/17, which simplifies to 4/17. You have to build the total from the data before you can write the probability.

5 C — 7/17 [D2.1] · Two steps. Total = 17. Probability = 7/17, which simplifies to 7/17. You have to build the total from the data before you can write the probability.

6 B — 7/23 [D2.1] · Two steps. Total = 23. Probability = 7/23, which simplifies to 7/23. You have to build the total from the data before you can write the probability.

7 B — 2/5 [D2.1] · Two steps. Total = 20. Probability = 8/20, which simplifies to 2/5. You have to build the total from the data before you can write the probability.

8 D — 2/11 [D2.1] · Two steps. Total = 22. Probability = 4/22, which simplifies to 2/11. You have to build the total from the data before you can write the probability.

9 A — 2/7 [D2.1] · Two steps. Total = 21. Probability = 6/21, which simplifies to 2/7. You have to build the total from the data before you can write the probability.

10 B — 4/27 [D2.1] · Two steps. Total = 27. Probability = 4/27, which simplifies to 4/27. You have to build the total from the data before you can write the probability.

11 D — 3/8 [D2.1] · Two steps. Total = 16. Probability = 6/16, which simplifies to 3/8. You have to build the total from the data before you can write the probability.

12 B — 5/24 [D2.1] · Two steps. Total = 24. Probability = 5/24, which simplifies to 5/24. You have to build the total from the data before you can write the probability.

Sheet 17

1 D — 10 [C2.3] · Set up the equation: 5n + 3 = 53. Subtract 3: 5n = 50. Divide by 5: n = 10. Pattern rules and equations are the same job in different clothes.

2 A — 7 [C2.3] · Set up the equation: 4n + 1 = 29. Subtract 1: 4n = 28. Divide by 4: n = 7. Pattern rules and equations are the same job in different clothes.

3 B — 8 [C2.3] · Set up the equation: 5n + 3 = 43. Subtract 3: 5n = 40. Divide by 5: n = 8. Pattern rules and equations are the same job in different clothes.

4 A — 12 [C2.3] · Set up the equation: 3n + 2 = 38. Subtract 2: 3n = 36. Divide by 3: n = 12. Pattern rules and equations are the same job in different clothes.

5 B — 11 [C2.3] · Set up the equation: 4n + 1 = 45. Subtract 1: 4n = 44. Divide by 4: n = 11. Pattern rules and equations are the same job in different clothes.

6 B — 13 [C2.3] · Set up the equation: 5n + 3 = 68. Subtract 3: 5n = 65. Divide by 5: n = 13. Pattern rules and equations are the same job in different clothes.

7 A — 13 [C2.3] · Set up the equation: 6n + 2 = 80. Subtract 2: 6n = 78. Divide by 6: n = 13. Pattern rules and equations are the same job in different clothes.

8 A — 12 [C2.3] · Set up the equation: 4n + 1 = 49. Subtract 1: 4n = 48. Divide by 4: n = 12. Pattern rules and equations are the same job in different clothes.

9 D — 14 [C2.3] · Set up the equation: 6n + 2 = 86. Subtract 2: 6n = 84. Divide by 6: n = 14. Pattern rules and equations are the same job in different clothes.

10 A — 13 [C2.3] · Set up the equation: 5n + 3 = 68. Subtract 3: 5n = 65. Divide by 5: n = 13. Pattern rules and equations are the same job in different clothes.

11 A — 12 [C2.3] · Set up the equation: 5n + 3 = 63. Subtract 3: 5n = 60. Divide by 5: n = 12. Pattern rules and equations are the same job in different clothes.

12 D — 13 [C2.3] · Set up the equation: 4n + 1 = 53. Subtract 1: 4n = 52. Divide by 4: n = 13. Pattern rules and equations are the same job in different clothes.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 18

1 B — 0.8 km [E2.1] · Two steps and a unit change. 40 × 20 = 800 m. Then ÷ 1000 to get 0.8 km. Answering in metres is the trap.

2 C — 0.96 km [E2.1] · Two steps and a unit change. 40 × 24 = 960 m. Then ÷ 1000 to get 0.96 km. Answering in metres is the trap.

3 A — 0.6 km [E2.1] · Two steps and a unit change. 20 × 30 = 600 m. Then ÷ 1000 to get 0.6 km. Answering in metres is the trap.

4 D — 0.6 km [E2.1] · Two steps and a unit change. 50 × 12 = 600 m. Then ÷ 1000 to get 0.6 km. Answering in metres is the trap.

5 B — 1.2 km [E2.1] · Two steps and a unit change. 50 × 24 = 1200 m. Then ÷ 1000 to get 1.2 km. Answering in metres is the trap.

6 D — 1 km [E2.1] · Two steps and a unit change. 50 × 20 = 1000 m. Then ÷ 1000 to get 1 km. Answering in metres is the trap.

7 B — 0.48 km [E2.1] · Two steps and a unit change. 20 × 24 = 480 m. Then ÷ 1000 to get 0.48 km. Answering in metres is the trap.

8 C — 0.96 km [E2.1] · Two steps and a unit change. 40 × 24 = 960 m. Then ÷ 1000 to get 0.96 km. Answering in metres is the trap.

9 A — 0.3 km [E2.1] · Two steps and a unit change. 25 × 12 = 300 m. Then ÷ 1000 to get 0.3 km. Answering in metres is the trap.

10 C — 0.48 km [E2.1] · Two steps and a unit change. 20 × 24 = 480 m. Then ÷ 1000 to get 0.48 km. Answering in metres is the trap.

11 D — 0.5 km [E2.1] · Two steps and a unit change. 25 × 20 = 500 m. Then ÷ 1000 to get 0.5 km. Answering in metres is the trap.

12 D — 0.45 km [E2.1] · Two steps and a unit change. 15 × 30 = 450 m. Then ÷ 1000 to get 0.45 km. Answering in metres is the trap.

Sheet 19

1 D — $180 [E2.6] · Two steps. Surface area = 2 × (5×5 + 5×2 + 5×2) = 90 m². Cost = 90 × $2 = $180. Volume would be the wrong measure entirely.

2 C — $282 [E2.6] · Two steps. Surface area = 2 × (5×4 + 5×3 + 4×3) = 94 m². Cost = 94 × $3 = $282. Volume would be the wrong measure entirely.

3 C — $156 [E2.6] · Two steps. Surface area = 2 × (4×3 + 4×2 + 3×2) = 52 m². Cost = 52 × $3 = $156. Volume would be the wrong measure entirely.

4 A — $144 [E2.6] · Two steps. Surface area = 2 × (6×2 + 6×3 + 2×3) = 72 m². Cost = 72 × $2 = $144. Volume would be the wrong measure entirely.

5 D — $156 [E2.6] · Two steps. Surface area = 2 × (4×3 + 4×2 + 3×2) = 52 m². Cost = 52 × $3 = $156. Volume would be the wrong measure entirely.

6 B — $156 [E2.6] · Two steps. Surface area = 2 × (4×3 + 4×2 + 3×2) = 52 m². Cost = 52 × $3 = $156. Volume would be the wrong measure entirely.

7 A — $216 [E2.6] · Two steps. Surface area = 2 × (6×2 + 6×3 + 2×3) = 72 m². Cost = 72 × $3 = $216. Volume would be the wrong measure entirely.

8 D — $144 [E2.6] · Two steps. Surface area = 2 × (6×2 + 6×3 + 2×3) = 72 m². Cost = 72 × $2 = $144. Volume would be the wrong measure entirely.

9 B — $450 [E2.6] · Two steps. Surface area = 2 × (5×5 + 5×2 + 5×2) = 90 m². Cost = 90 × $5 = $450. Volume would be the wrong measure entirely.

10 A — $470 [E2.6] · Two steps. Surface area = 2 × (5×4 + 5×3 + 4×3) = 94 m². Cost = 94 × $5 = $470. Volume would be the wrong measure entirely.

11 C — $216 [E2.6] · Two steps. Surface area = 2 × (6×2 + 6×3 + 2×3) = 72 m². Cost = 72 × $3 = $216. Volume would be the wrong measure entirely.

12 B — $144 [E2.6] · Two steps. Surface area = 2 × (6×2 + 6×3 + 2×3) = 72 m². Cost = 72 × $2 = $144. Volume would be the wrong measure entirely.

Sheet 20

1 B — about 11 [B2.3] · Round each to the nearest whole number and add: about 11. The exact total is 11.21. Estimating catches a misplaced decimal point instantly.

2 B — about 19 [B2.3] · Round each to the nearest whole number and add: about 19. The exact total is 19.26. Estimating catches a misplaced decimal point instantly.

3 C — about 800 [B2.3] · Round each number to the nearest ten: 40 × 20 = 800. The exact answer is 792. Estimating first tells you whether your exact answer is sensible.

4 D — about 16 [B2.3] · Round each to the nearest whole number and add: about 16. The exact total is 16.22. Estimating catches a misplaced decimal point instantly.

5 D — about 19 [B2.3] · 4 goes into 77 about 19 times. Dividing makes the number smaller, so an answer bigger than 77 would be nonsense.

6 A — about 80 [B2.3] · 21% is close to 20%, and 20% of 400 = 80. Snapping to a friendly percent is faster and usually close enough.

7 D — about 2800 [B2.3] · Round each number to the nearest ten: 70 × 40 = 2800. The exact answer is 2808. Estimating first tells you whether your exact answer is sensible.

8 D — about 400 [B2.3] · 49% is close to 50%, and 50% of 800 = 400. Snapping to a friendly percent is faster and usually close enough.

9 B — about 1600 [B2.3] · Round each number to the nearest ten: 20 × 80 = 1600. The exact answer is 1764. Estimating first tells you whether your exact answer is sensible.

10 B — about 3200 [B2.3] · Round each number to the nearest ten: 80 × 40 = 3200. The exact answer is 3002. Estimating first tells you whether your exact answer is sensible.

11 C — about 13 [B2.3] · 5 goes into 63 about 13 times. Dividing makes the number smaller, so an answer bigger than 63 would be nonsense.

12 D — about 28 [B2.3] · Round each to the nearest whole number and add: about 28. The exact total is 27.31. Estimating catches a misplaced decimal point instantly.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 21

1 C — 0.4 or any value from 0 to 1 [B2.1] · A probability can never exceed 1. Anything above 1 means the calculation went wrong. Checking whether an answer is **reasonable** catches more marks than recalculating does.

2 C — 0.4 or any value from 0 to 1 [B2.1] · A probability can never exceed 1. Anything above 1 means the calculation went wrong. Checking whether an answer is **reasonable** catches more marks than recalculating does.

3 D — 0.4 or any value from 0 to 1 [B2.1] · A probability can never exceed 1. Anything above 1 means the calculation went wrong. Checking whether an answer is **reasonable** catches more marks than recalculating does.

4 A — 14 [B2.1] · The mean must sit between the smallest and largest value. 42 is bigger than all of them — that is the total, not the mean. Checking whether an answer is **reasonable** catches more marks than recalculating does.

5 B — 20 [B2.1] · A percentage less than 100% must give an answer smaller than the original. They multiplied instead of dividing. Checking whether an answer is **reasonable** catches more marks than recalculating does.

6 A — 20 cm² [B2.1] · 18 is the perimeter, not the area. Area is 5 × 4. Checking whether an answer is **reasonable** catches more marks than recalculating does.

7 B — 2.1 m [B2.1] · A door is about two metres. Kilometres are for distances between places. Checking whether an answer is **reasonable** catches more marks than recalculating does.

8 B — 20 cm² [B2.1] · 18 is the perimeter, not the area. Area is 5 × 4. Checking whether an answer is **reasonable** catches more marks than recalculating does.

9 D — 14 [B2.1] · The mean must sit between the smallest and largest value. 42 is bigger than all of them — that is the total, not the mean. Checking whether an answer is **reasonable** catches more marks than recalculating does.

10 C — 0.4 or any value from 0 to 1 [B2.1] · A probability can never exceed 1. Anything above 1 means the calculation went wrong. Checking whether an answer is **reasonable** catches more marks than recalculating does.

11 C — 20 [B2.1] · A percentage less than 100% must give an answer smaller than the original. They multiplied instead of dividing. Checking whether an answer is **reasonable** catches more marks than recalculating does.

12 C — 0.4 or any value from 0 to 1 [B2.1] · A probability can never exceed 1. Anything above 1 means the calculation went wrong. Checking whether an answer is **reasonable** catches more marks than recalculating does.

Sheet 22

1 A — 75 [B2.12] · If 20% is 15, then 100% is 15 ÷ 20 × 100 = 75. Check it: 20% of 75 = 15.

2 D — 45 [D1.5] · The total must be 16 × 4 = 64. The known numbers add to 19, so the missing one is 64 − 19 = 45.

3 D — 7 minutes [B2.12] · Total ÷ rate = time: 84 ÷ 12 = 7 minutes.

4 D — 35 [D1.5] · The total must be 16 × 5 = 80. The known numbers add to 45, so the missing one is 80 − 45 = 35.

5 A — 24 [B2.12] · If 50% is 12, then 100% is 12 ÷ 50 × 100 = 24. Check it: 50% of 24 = 12.

6 D — 6 minutes [B2.12] · Total ÷ rate = time: 90 ÷ 15 = 6 minutes.

7 D — 9 minutes [B2.12] · Total ÷ rate = time: 135 ÷ 15 = 9 minutes.

8 B — 8 cm [E2.4] · A = b × h, so b = A ÷ h = 48 ÷ 6 = 8 cm. Working backwards through a formula is the same formula, rearranged.

9 D — 160 [B2.12] · If 25% is 40, then 100% is 40 ÷ 25 × 100 = 160. Check it: 25% of 160 = 40.

10 C — 160 [B2.12] · If 25% is 40, then 100% is 40 ÷ 25 × 100 = 160. Check it: 25% of 160 = 40.

11 A — 150 [B2.12] · If 20% is 30, then 100% is 30 ÷ 20 × 100 = 150. Check it: 20% of 150 = 30.

12 D — 12 cm [E2.4] · A = b × h, so b = A ÷ h = 60 ÷ 5 = 12 cm. Working backwards through a formula is the same formula, rearranged.

Sheet 23

1 D and E — 36, 63 [B2.2] · A multiple of 9 divides by 9 with nothing left over. Check each option — there is more than one right answer.

2 A and C — all four sides are equal, the diagonals meet at right angles [E1.1] · A rhombus has equal sides and perpendicular diagonals, but its angles are not all right angles and its diagonals are not equal — that is a square.

3 A and B — 19, 17 [B2.6] · A prime has exactly two factors. Test 3, 7, 11 and 13 as divisors on each one.

4 A and E — 43, 31 [B2.6] · A prime has exactly two factors. Test 3, 7, 11 and 13 as divisors on each one.

5 B and D — 12 + 12, 48 ÷ 2 [C2.2] · More than one is correct — work out all of them before you stop. Students routinely select the first right answer and move on.

6 B and C — 18, 42 [B2.2] · A multiple of 6 divides by 6 with nothing left over. Check each option — there is more than one right answer.

7 B and D — 18, 48 [B2.2] · A multiple of 6 divides by 6 with nothing left over. Check each option — there is more than one right answer.

8 B and D — all four sides are equal, the diagonals meet at right angles [E1.1] · A rhombus has equal sides and perpendicular diagonals, but its angles are not all right angles and its diagonals are not equal — that is a square.

9 D and E — 17, 31 [B2.6] · A prime has exactly two factors. Test 3, 7, 11 and 13 as divisors on each one.

10 A and B — 37, 13 [B2.6] · A prime has exactly two factors. Test 3, 7, 11 and 13 as divisors on each one.

11 B and E — 18, 36 [B2.2] · A multiple of 9 divides by 9 with nothing left over. Check each option — there is more than one right answer.

12 A and B — 24, 15 [B2.2] · A multiple of 3 divides by 3 with nothing left over. Check each option — there is more than one right answer.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 24

1 D — a triangle with base 10 cm and height 4 cm → a rhombus with diagonals 8 cm and 6 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm [E2.4] · Work out every area with the formula sheet before ordering: a triangle = 20 cm² · a rhombus = 24 cm² · a trapezoid = 24 cm².

2 B — −2, −1, 3/4, 2 [B1.3] · Convert everything to decimals first. Every negative comes before every positive, and −2 is less than −1.

3 A — a 4 cm by 4 cm square → a rhombus with diagonals 8 cm and 6 cm → a 6 cm by 5 cm rectangle [E2.4] · Work out every area with the formula sheet before ordering: a 4 cm by 4 cm square = 16 cm² · a rhombus = 24 cm² · a 6 cm by 5 cm rectangle = 30 cm².

4 B — −2, 1/5, 0.5, 2 [B1.3] · Convert everything to decimals first. Every negative comes before every positive, and −2 is less than −1.

5 D — a triangle with base 10 cm and height 4 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a 6 cm by 5 cm rectangle [E2.4] · Work out every area with the formula sheet before ordering: a triangle = 20 cm² · a trapezoid = 24 cm² · a 6 cm by 5 cm rectangle = 30 cm².

6 D — 1/2, 2/3, 7/10, 3/4 [B1.3] · Turn each fraction into a decimal, or give them all a common denominator. A bigger denominator does not mean a bigger fraction.

7 C — a 4 cm by 4 cm square → a rhombus with diagonals 8 cm and 6 cm → a 6 cm by 5 cm rectangle [E2.4] · Work out every area with the formula sheet before ordering: a 4 cm by 4 cm square = 16 cm² · a rhombus = 24 cm² · a 6 cm by 5 cm rectangle = 30 cm².

8 D — a triangle with base 10 cm and height 4 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a 6 cm by 5 cm rectangle [E2.4] · Work out every area with the formula sheet before ordering: a triangle = 20 cm² · a trapezoid = 24 cm² · a 6 cm by 5 cm rectangle = 30 cm².

9 D — 1/4, 2/5, 7/10, 3/4 [B1.3] · Turn each fraction into a decimal, or give them all a common denominator. A bigger denominator does not mean a bigger fraction.

10 C — a triangle with base 10 cm and height 4 cm → a rhombus with diagonals 8 cm and 6 cm → a 6 cm by 5 cm rectangle [E2.4] · Work out every area with the formula sheet before ordering: a triangle = 20 cm² · a rhombus = 24 cm² · a 6 cm by 5 cm rectangle = 30 cm².

11 B — −1, −0.25, 1/5, 3/4 [B1.3] · Convert everything to decimals first. Every negative comes before every positive, and −2 is less than −1.

12 B — −0.25, 1/5, 0.5, 3/4 [B1.3] · Convert everything to decimals first. Every negative comes before every positive, and −2 is less than −1.

Sheet 25

1 B — 5.1668 kg [B2.11] · Divide as usual and keep the decimal point directly above where it started.

2 B — $2^2 \times 3 \times 5$ [B2.6] · Build a factor tree and keep splitting until every branch ends on a prime. 60 = $2^2 \times 3 \times 5$. Multiply it back to check.

3 A — 25 [B2.9] · Multiplying by 5/6: divide 30 by 6 (= 5), then multiply by 5 = 25.

4 A — 3 [C2.4] · Solve as if it were an equation, then check whether the boundary value itself works.

5 B — Program B — it uses a loop, so fewer lines do the same work [C3.2] · Both give 30. Efficiency is about how much code it takes to express the work. A loop is the efficient form, and changing 6 then means editing one number instead of 6 lines.

6 D — Extra dimensions make some bars look bigger than their value. [D1.6] · Always read the axis before the bars.

7 C — 44 [D1.3] · A stem-and-leaf plot is already in order, which is why it is handy for finding a median. Count in from both ends.

8 B — 294 cm² [E2.6] · Six faces, in three matching pairs. Find the area of three different faces, add them, then double. Surface area is cm², not cm³.

9 C — 108 cm² [E2.4] · For a kite, A = c × d ÷ 2 where c and d are the **diagonals**, not the sides. 18 × 12 ÷ 2 = 108 cm². This formula is printed on your formula sheet.

10 A — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

Sheet 26

1 B — 12 cm [E2.4] · A = b × h, so b = A ÷ h = 60 ÷ 5 = 12 cm. Working backwards through a formula is the same formula, rearranged.

2 A — 14 [B1.2] · Distance on a number line is always positive. Count from a up to 0, then 0 up to b.

3 A — 29 [B1.5] · Look only at the digit immediately to the right of the place you are rounding to.

4 A — 33 [C1.3] · Write out the first six terms of each pattern, then look for the number in all three lists. Do not stop at the first pattern.

5 B — 14 [C2.3] · Undo the + 14 first, then undo the × 7.

6 B — histogram [D1.3] · Intervals of a continuous quantity on the horizontal axis means a histogram — the bars touch because the data is continuous. This was the hardest question on the released set — only 37% of students at Level 3, and 56% at Level 4, chose correctly.

7 C — 70% [D2.1] · 14 out of 20 = 7/10. Turn that into hundredths.

8 B — $192 [E2.4] · Three steps. Area = 8 × 6 = 48 m². Cost = 48 × $5 = $240. Discount = 20% of $240 = $48, so final = $192. Stopping at $240 is the trap.

9 B and C — all four sides are equal, the diagonals meet at right angles [E1.1] · A rhombus has equal sides and perpendicular diagonals, but its angles are not all right angles and its diagonals are not equal — that is a square.

10 C — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Sheet 27

1 B — 98.39 [B2.4] · Line up the decimal points, not the last digits.

2 D — 20 [B2.8] · Dividing by 0.5 makes the answer bigger, not smaller. Multiply both numbers by 10 first: 100 ÷ 5.

3 C — 7.5 [B2.12] · 15% means 15 out of every 100.

4 A — 1.5 [C1.4] · The rule is add 0.25 each time. Line the decimals up before adding — the pattern is showing how decimals build in equal steps.

5 C — linear growing — it goes up by the same amount each time [C1.1] · Linear means a constant jump. Check the gap between every pair, not just the first.

6 B — 8/25 [D2.1] · Two steps. Total = 25. Probability = 8/25, which simplifies to 8/25. You have to build the total from the data before you can write the probability.

7 C — 37 [D1.5] · Range = largest − smallest. Median = the middle one once they are in order. Mean = add them all and divide by how many.

8 D — 135° [E2.3] · Supplementary angles sum to 180°.

9 A — 310 cm² [E2.6] · Six faces, in three matching pairs. Find the area of three different faces, add them, then double. Surface area is cm², not cm³.

10 A — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 28

1 C — 30 [B2.9] · Multiplying by 5/6: divide 36 by 6 (= 6), then multiply by 5 = 30.

2 B — about 27 [B2.3] · Round each to the nearest whole number and add: about 27. The exact total is 26.9. Estimating catches a misplaced decimal point instantly.

3 B — a 4 cm by 4 cm square → a triangle with base 10 cm and height 4 cm → a rhombus with diagonals 8 cm and 6 cm [E2.4] · Work out every area with the formula sheet before ordering: a 4 cm by 4 cm square = 16 cm² · a triangle = 20 cm² · a rhombus = 24 cm².

4 A — has its last two digits divisible by 4 [C3.1] · Divisible by 4 exactly when it has its last two digits divisible by 4. A condition that is only *sometimes* true is not a rule.

5 C — 17 [C3.2] · Before: 5 + (5 × 2) = 15. After: 5 + (6 × 2) = 17. Reading and altering existing code is expectation C3.2.

6 D — Random variation — a finite number of trials rarely matches the theory exactly [D2.2] · They are measuring different things. The more trials you run, the closer the experimental value usually gets to the theoretical one — but it need not ever match exactly.

7 A — continuous [D1.1] · Continuous data is measured and can take any value in between — including fractions.

8 B — the same result as a single reflection in the x-axis [E1.4] · Do the transformations one at a time on grid paper. Two identical reflections, or two 180° rotations, always undo each other.

9 A — $288 [E2.4] · Three steps. Area = 9 × 8 = 72 m². Cost = 72 × $5 = $360. Discount = 20% of $360 = $72, so final = $288. Stopping at $360 is the trap.

10 B — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Sheet 29

1 C — 89.26 [B1.5] · Look only at the digit immediately to the right of the place you are rounding to.

2 B and E — 31, 17 [B2.6] · A prime has exactly two factors: 1 and itself. Check 3, 7, 11 and 13 as divisors — 39% of students at Level 3 missed one of the two.

3 D — 19/15 [B2.5] · Find a common denominator first — 12 and 5 both go into 60. Never add the denominators.

4 C — 8x [C2.1] · Like terms add. The x stays an x — it does not become x².

5 D — 71 + p = 118 [C2.3] · Solve every single one before choosing. Two of these are within a couple of units of each other, and nearly half of students at Level 2 picked the wrong one of the pair.

6 A — a biased sample [D1.2] · The group chosen already has a stake in the answer. A sample only works if it represents the whole population.

7 C — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 11, 29, 43, 45, 55. The middle value is 43. A median only means anything once the data is sorted.

8 C — 270° clockwise [E1.4] · A full turn is 360°. Going 90° one way is the same as going 270° the other way.

9 C — 39° [E2.3] · Opposite (vertical) angles are equal.

10 C — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

Sheet 30

1 B — 28 kg [B2.12] · Sand went up by a factor of 7, so cement must too.

2 B — composite [B2.6] · 51 is composite — it has a factor other than 1 and itself (3 divides it). Always test 3, 7, 11 and 13.

3 D — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 30 first: the correct answer is 21/30.

4 C — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 12 + (4 × 4) = 28. Applying a rule once and then guessing is the single most common pattern error.

5 B — 13 [C1.3] · The term value goes up 3 each time the term number goes up 2, so the rule is value = 3 × term + 1. Solve for the TERM NUMBER — the commonest error is giving another term value instead.

6 C — 53 [D1.3] · A stem-and-leaf plot is already in order, which is why it is handy for finding a median. Count in from both ends.

7 B — tell a story about the data using graphs, numbers and other relevant information together [D1.4] · An infographic combines more than one representation — a table, a graph, a headline figure — to make a point. It still needs proper sources, titles, labels and scales.

8 A — 2 [E1.1] · Turn it one full circle and count how many times it looks the same, including at the end. A rhombus has order 2. Every shape has order at least 1.

9 C — the shape is back exactly where it started [E1.4] · Do the transformations one at a time on grid paper. Two identical reflections, or two 180° rotations, always undo each other.

10 D — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

Sheet 31

1 B — a triangle with base 10 cm and height 4 cm → a trapezoid with parallel sides 5 cm and 7 cm and height 4 cm → a 6 cm by 5 cm rectangle [E2.4] · Work out every area with the formula sheet before ordering: a triangle = 20 cm² · a trapezoid = 24 cm² · a 6 cm by 5 cm rectangle = 30 cm².

2 D — −3, −1, 0.2, 3/4 [B1.3] · Turn every one into a decimal first. Negatives are always smaller than positives.

3 C — 0.06 [B1.6] · 6 tenths written as a decimal is 0.6. Count the places carefully — a third of students at Level 3 got the equivalent of this wrong.

4 B — 24 [C3.2] · The loop runs 3 times, adding 5 each time: 9 + (3 × 5).

5 D — multiply the term number by 4, then add 7 [C1.2] · The term value rises 4 each time the term number rises 1, so the multiplier is 4. At term 1 the value is 11, so the constant is 7. Value = 4 × term + 7.

6 B — 60% [D2.1] · 6 out of 10 = 3/5. Turn that into hundredths.

7 B — line plot [D1.3] · A line plot stacks an X above each value on a number line, so the shape of the data shows. All three appear in the EQAO glossary, so all three can turn up.

8 C — equal, do not bisect [E1.1] · Draw both diagonals and check three things: equal length, right angles, and whether each cuts the other in half.

9 C — 90° counterclockwise [E1.4] · A full turn is 360°. Going 270° one way is the same as going 90° the other way.

10 A — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 32

1 B — 0 [B2.5] · Find a common denominator first — 4 and 8 both go into 8. Never add the denominators.

2 A — 4 [B2.9] · Multiplying by 1/5: divide by 5, then multiply by 1.

3 D — 167 [B2.1] · Two operations, in order. Multiply first, then subtract.

4 B — 37.5 [C2.2] · Multiply before you add. Order of operations.

5 C — 7 [C2.4] · Solve as if it were an equation, then check whether the boundary value itself works.

6 A — 31 [D1.5] · Range = largest − smallest. Median = the middle one once they are in order. Mean = add them all and divide by how many.

7 B — 1/9 [D2.2] · For two independent events, multiply the probabilities.

8 D — 45 cm² [E2.4] · A = b × h uses the **perpendicular** height (5 cm), never the slanted side (7 cm). Multiplying by the slant is the commonest area error there is.

9 B — 1 [E1.1] · Turn it one full circle and count how many times it looks the same, including at the end. A isosceles trapezoid has order 1. Every shape has order at least 1.

10 B — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

Sheet 33

1 C — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 24 first: the correct answer is 29/24.

2 A — 0.4 or any value from 0 to 1 [B2.1] · A probability can never exceed 1. Anything above 1 means the calculation went wrong. Checking whether an answer is **reasonable** catches more marks than recalculating does.

3 A — 0 [B1.1] · Ten thousands is the fifth digit from the right.

4 A — 10 [C2.3] · Set up the equation: 6n + 2 = 62. Subtract 2: 6n = 60. Divide by 6: n = 10. Pattern rules and equations are the same job in different clothes.

5 B — 22 [C1.3] · Write out the first six terms of each pattern, then look for the number in all three lists. Do not stop at the first pattern.

6 D — continuous [D1.1] · Continuous data is measured and can take any value in between — including fractions.

7 B — It exaggerates small differences — the bars look many times taller than each other. [D1.6] · Always read the axis before the bars.

8 A — $216 [E2.6] · Two steps. Surface area = 2 × (6×2 + 6×3 + 2×3) = 72 m². Cost = 72 × $3 = $216. Volume would be the wrong measure entirely.

9 C — equal, perpendicular, bisect each other [E1.1] · Draw both diagonals and check three things: equal length, right angles, and whether each cuts the other in half.

10 B — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Sheet 34

1 C — 0.04 [B1.6] · 4 tenths written as a decimal is 0.4. Count the places carefully — a third of students at Level 3 got the equivalent of this wrong.

2 A — 2.4 [B2.3] · 1% of 240: find 10% first (24), then adjust.

3 D — 5418 cm [B2.7] · Multiply as whole numbers, then put back one decimal place.

4 A — Program B — it uses a loop, so fewer lines do the same work [C3.2] · Both give 50. Efficiency is about how much code it takes to express the work. A loop is the efficient form, and changing 5 then means editing one number instead of 5 lines.

5 B — 70000 [C1.4] · Each term is 10 times the one before, so the digits stay the same and the decimal point moves one place right each time.

6 A — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 19, 25, 32, 42, 59. The middle value is 32. A median only means anything once the data is sorted.

7 A — histogram [D1.3] · Grouped intervals of measured data means a histogram. This was the hardest question on the released set — only 37% of students at Level 3, and 56% at Level 4, chose correctly.

8 C — 90 cm² [E2.4] · Area of a trapezoid = (sum of the parallel sides) × height ÷ 2. Or decompose it into a rectangle and two triangles.

9 C — 126 cm² [E2.4] · A = b × h uses the **perpendicular** height (9 cm), never the slanted side (11 cm). Multiplying by the slant is the commonest area error there is.

10 A — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Sheet 35

1 D — 223 [B2.1] · Two operations, in order. Multiply first, then subtract.

2 D — 3 × 100 000 + 1 × 10 000 + 3 × 1000 + 1 × 100 + 9 × 1 [B1.1] · Expanded form shows each digit multiplied by its place value, added together. A zero digit contributes nothing and is left out.

3 B — They added before multiplying [B2.1] · Multiplication comes before addition. 6 × 2 = 12, then + 7 = 19. Their answer 26 is what (7 + 6) × 2 would give.

4 B — 15 [C2.3] · Undo the + 15 first, then undo the × 4.

5 C — has a digit sum divisible by 9 [C3.1] · Divisible by 9 exactly when it has a digit sum divisible by 9. A condition that is only *sometimes* true is not a rule.

6 B — tell a story about the data using graphs, numbers and other relevant information together [D1.4] · An infographic combines more than one representation — a table, a graph, a headline figure — to make a point. It still needs proper sources, titles, labels and scales.

7 B — 2/23 [D2.1] · Two steps. Total = 23. Probability = 2/23, which simplifies to 2/23. You have to build the total from the data before you can write the probability.

8 A — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (10), never the slant (13). The correct area is 16 × 10 = 160 cm².

9 B — $360 [E2.6] · Two steps. Surface area = 2 × (6×2 + 6×3 + 2×3) = 72 m². Cost = 72 × $5 = $360. Volume would be the wrong measure entirely.

10 A — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 36

1 B — 30,000 [B1.1] · Ten thousands is the fifth digit from the right.

2 D — 2.824 [B1.4] · Line the decimals up by place value. Compare tenths, then hundredths, then thousandths.

3 A — 946 [B2.2] · Divisible by 2 when the last digit is even.

4 A — linear growing — it goes up by the same amount each time [C1.1] · Linear means a constant jump. Check the gap between every pair, not just the first.

5 C — 11x [C2.1] · Like terms add. The x stays an x — it does not become x^2.

6 B — frequency table [D1.3] · A frequency table lists each value or interval beside how many times it occurred. All three appear in the EQAO glossary, so all three can turn up.

7 A — 1/4 [D2.2] · Theoretical probability is worked out from the design, not from any trial: 1 red section out of 4 = 1/4.

8 D — 288° [E2.2] · Clockwise gives 72°. A full turn is 360°, so counterclockwise is 360 − 72 = 288°. Only 26% of students at Level 2 got this.

9 B — 36 cm^2 [E2.4] · Area of a trapezoid = (sum of the parallel sides) × height ÷ 2. Or decompose it into a rectangle and two triangles.

10 C — it interferes [F1.3] · It either takes money away or makes the goal easier to lose sight of. Naming the interference is the first step to planning round it.

Sheet 38

1 A — 14 [C2.3] · Set up the equation: 4n + 1 = 57. Subtract 1: 4n = 56. Divide by 4: n = 14. Pattern rules and equations are the same job in different clothes.

2 B — has a digit sum divisible by 9 [C3.1] · Divisible by 9 exactly when it has a digit sum divisible by 9. A condition that is only *sometimes* true is not a rule.

3 C — line plot [D1.3] · A line plot stacks an X above each value on a number line, so the shape of the data shows. All three appear in the EQAO glossary, so all three can turn up.

4 A — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (8), never the slant (10). The correct area is 12 × 8 = 96 cm^2.

5 D — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 24 first: the correct answer is 20/24.

6 C — 0.15 m^2 [E2.1] · There are 10000 cm^2 in 1 m^2, so divide.

7 B — 1/2 [D2.1] · Reduce by the highest common factor.

8 C — $45 [F1.1] · 25% of $60 = $15 — that is the discount, not the price. Subtract it: $60 − $15 = $45. Answering with the discount is the trap.

9 A — 4 [E1.1] · Turn it one full circle and count how many times it looks the same, including at the end. A square has order 4. Every shape has order at least 1.

10 C — trading [F1.5] · Four different ways resources move between people.

11 D — it helps [F1.3] · This removes a decision or a temptation, which is what makes it help. Expectation F1.3 is about identifying these, not just naming the goal.

Sheet 39

12 B — 2.4 [C1.4] · The rule is add 0.3 each time. Line the decimals up before adding — the pattern is showing how decimals build in equal steps.

13 B — 30 [B2.12] · 25% means 25 out of every 100.

14 D — about 15 [B2.3] · Round each to the nearest whole number and add: about 15. The exact total is 14.98. Estimating catches a misplaced decimal point instantly.

15 C — tell a story about the data using graphs, numbers and other relevant information together [D1.4] · An infographic combines more than one representation — a table, a graph, a headline figure — to make a point. It still needs proper sources, titles, labels and scales.

16 D — They used the slanted side instead of the perpendicular height [E2.4] · A = b × h needs the perpendicular height (8), never the slant (10). The correct area is 12 × 8 = 96 cm^2.

17 C — 7/27 [D2.1] · Two steps. Total = 27. Probability = 7/27, which simplifies to 7/27. You have to build the total from the data before you can write the probability.

18 B — 1/3, 2/5, 1/2, 2/3 [B1.3] · Turn each fraction into a decimal, or give them all a common denominator. A bigger denominator does not mean a bigger fraction.

19 C and E — 17, 37 [B2.6] · A prime has exactly two factors. Test 3, 7, 11 and 13 as divisors on each one.

20 C — 22 [B2.9] · Multiplying by 2/3: divide 33 by 3 (= 11), then multiply by 2 = 22.

21 C — 38 [C1.3] · Write out the first six terms of each pattern, then look for the number in all three lists. Do not stop at the first pattern.

22 C — bar graph [D1.3] · Separate, unrelated categories means a bar graph with gaps between the bars. This was the hardest question on the released set — only 37% of students at Level 3, and 56% at Level 4, chose correctly.

Answers, continued

Sheet 40

23 D — 18 [B2.9] · Multiplying by 3/6: divide by 6, then multiply by 3.

24 C — 33.5 [D1.3] · A stem-and-leaf plot is already in order, which is why it is handy for finding a median. Count in from both ends.

25 B — They applied the rule once instead of 4 times [C1.3] · From term 1 to term 5 is 4 jumps, not one. 5 + (4 × 4) = 21. Applying a rule once and then guessing is the single most common pattern error.

26 D — 250 [B2.3] · 50% of 500: find 10% first (50), then adjust.

27 A — 14.6 [C2.2] · Multiply before you add. Order of operations.

28 A — 3.2 km [E2.1] · There are 1000 m in 1 km, so divide.

29 A — 42 [D1.5] · Range = largest − smallest. Median = the middle one once they are in order. Mean = add them all and divide by how many.

30 C — composite [B2.6] · 91 is composite — it has a factor other than 1 and itself (7 divides it). Always test 3, 7, 11 and 13.

31 A — rhombus [E1.1] · Fold it in half. A square has 4, a rectangle and a rhombus have 2, a kite has 1, a parallelogram has 0. Only 48% of students at Level 3 got the rhombus version right.

32 B — 40 [B2.1] · Two operations, in order. Multiply first, then subtract.

33 B — 4 [E1.1] · Turn it one full circle and count how many times it looks the same, including at the end. A square has order 4. Every shape has order at least 1.

Sheet 41

34 C — 52 [C3.2] · The loop runs 5 times, adding 10 each time: 2 + (5 × 10).

35 D — 14 [B1.2] · Distance on a number line is always positive. Count from a up to 0, then 0 up to b.

36 C — 5.623 [B1.4] · Line the decimals up by place value. Compare tenths, then hundredths, then thousandths.

37 C — 240 [B2.2] · Divisible by 8 when the last three digits are divisible by 8.

38 A — They took the middle of the list without putting the numbers in order first [D1.5] · Order them first: 23, 36, 37, 40, 43. The middle value is 37. A median only means anything once the data is sorted.

39 C — square [E1.1] · Fold it in half. A square has 4, a rectangle and a rhombus have 2, a kite has 1, a parallelogram has 0. Only 48% of students at Level 3 got the rhombus version right.

40 C — 5227.2 cm [B2.7] · Multiply as whole numbers, then put back one decimal place.

41 A — 5 [C2.4] · Solve as if it were an equation, then check whether the boundary value itself works.

42 B — 122 cm² [E2.6] · Six faces, in three matching pairs. Find the area of three different faces, add them, then double. Surface area is cm², not cm³.

43 D — trading [F1.5] · This is trading. The four differ in whether money moves, whether it comes back, and who owes whom.

44 A — 10x [C2.1] · Like terms add. The x stays an x — it does not become x².

Sheet 43

1 C — about 36 [B2.3] · 4 goes into 145 about 36 times. Dividing makes the number smaller, so an answer bigger than 145 would be nonsense.

2 C — 4 [C2.4] · Solve as if it were an equation, then check whether the boundary value itself works.

3 C — fees [F1.2] · Fees: charges a bank or service makes for using an account or a card.

4 D — 5 up [E1.3] · Subtract the start from the finish. x controls left/right, y controls up/down. Watch the signs in the negative quadrants.

5 C — 55.05 [B2.4] · Line up the decimal points, not the last digits.

6 D — tell a story about the data using graphs, numbers and other relevant information together [D1.4] · An infographic combines more than one representation — a table, a graph, a headline figure — to make a point. It still needs proper sources, titles, labels and scales.

7 D — 9 × 100 000 + 6 × 10 000 + 7 × 1000 + 4 × 100 + 6 × 10 + 5 × 1 [B1.1] · Expanded form shows each digit multiplied by its place value, added together. A zero digit contributes nothing and is left out.

8 C — 15 [C1.3] · The term value goes up 4 each time the term number goes up 2, so the rule is value = 4 × term + 2. Solve for the TERM NUMBER — the commonest error is giving another term value instead.

9 C — prime [B2.6] · A prime has exactly two factors: 1 and itself.

10 B — 1 down [E1.3] · Subtract the start from the finish. x controls left/right, y controls up/down. Watch the signs in the negative quadrants.

11 B — $188 [E2.6] · Two steps. Surface area = 2 × (5×4 + 5×3 + 4×3) = 94 m². Cost = 94 × $2 = $188. Volume would be the wrong measure entirely.

Generated, not typed. Every numeric answer was computed by the same code that printed the question.

Answers, continued

Sheet 44

12 C — (9, 20) [C1.2] · Term 9 has value 2 × 9 + 2 = 20. The pair is written (term number, term value) — in that order.

13 A — 2%, by $60 [F1.4] · At 5%: $100. At 2%: $40. The lower rate always costs less when you are **borrowing** — but you want the higher rate when you are **saving**.

14 B — the shape is on the other side, 3 units from where it started [E1.4] · Do the transformations one at a time on grid paper. Two identical reflections, or two 180° rotations, always undo each other.

15 C — 2.1 m [B2.1] · A door is about two metres. Kilometres are for distances between places. Checking whether an answer is **reasonable** catches more marks than recalculating does.

16 D — 3380 cm [B2.7] · Multiply as whole numbers, then put back one decimal place.

17 A — 10/20 [D2.2] · Experimental probability comes from what actually happened: 10 out of 20. Theoretical probability comes from the design: 1/2.

18 B — bar graph [D1.3] · Separate, unrelated categories means a bar graph with gaps between the bars. This was the hardest question on the released set — only 37% of students at Level 3, and 56% at Level 4, chose correctly.

19 A — 23.7135 kg [B2.11] · Divide as usual and keep the decimal point directly above where it started.

20 A — 15 [B1.2] · Distance on a number line is always positive. Count from a up to 0, then 0 up to b.

21 C — Program B — it uses a loop, so fewer lines do the same work [C3.2] · Both give 40. Efficiency is about how much code it takes to express the work. A loop is the efficient form, and changing 4 then means editing one number instead of 4 lines.

22 C — 27 [D1.5] · Range = largest − smallest. Median = the middle one once they are in order. Mean = add them all and divide by how many.

Sheet 45

23 A — takes the money straight from your own bank account [F1.1] · Know the trade-off attached to each method.

24 B — 159 cm² [E2.4] · Decompose: whole rectangle 18×10 = 180, minus the notch 3×7 = 21. Only 39% of students at Level 3 handled a composite area correctly.

25 B — 816 [B2.2] · Divisible by 6 when it is divisible by both 2 and 3.

26 B — 2/7 [D2.1] · Two steps. Total = 21. Probability = 6/21, which simplifies to 2/7. You have to build the total from the data before you can write the probability.

27 C — They added the denominators instead of finding a common denominator [B2.5] · Denominators are never added. Rewrite both over 8 first: the correct answer is 6/8.

28 B — a factor that interferes with a goal [F1.2] · Separate the goal itself from the things that help or hinder it.

29 C — 3 [C2.3] · Undo the + 6 first, then undo the × 3.

30 D — 1/4 [D2.2] · For two independent events, multiply the probabilities.

31 B — 3/10 [D2.1] · Reduce by the highest common factor.

32 A — the same result as a single reflection in the x-axis [E1.4] · Do the transformations one at a time on grid paper. Two identical reflections, or two 180° rotations, always undo each other.

33 C — 14.60 [B1.5] · Look only at the digit immediately to the right of the place you are rounding to.

Sheet 46

34 D — 15 [C3.2] · Before: 3 + (5 × 2) = 13. After: 3 + (6 × 2) = 15. Reading and altering existing code is expectation C3.2.

35 A — 108 cm² [E2.4] · For a kite, A = c × d ÷ 2 where c and d are the **diagonals**, not the sides. 18 × 12 ÷ 2 = 108 cm². This formula is printed on your formula sheet.

36 A — 259 cm² [E2.4] · Decompose: whole rectangle 20×14 = 280, minus the notch 3×7 = 21. Only 39% of students at Level 3 handled a composite area correctly.

37 D — tally table [D1.3] · A tally table records each observation with a stroke, grouped in fives. All three appear in the EQAO glossary, so all three can turn up.

38 D — 1/4, 1/3, 3/4, 5/6 [B1.3] · Turn each fraction into a decimal, or give them all a common denominator. A bigger denominator does not mean a bigger fraction.

39 A — −3, −1, −1/2, 2 [B1.3] · Turn every one into a decimal first. Negatives are always smaller than positives.

40 D — linear growing — it goes up by the same amount each time [C1.1] · Linear means a constant jump. Check the gap between every pair, not just the first.

41 D — 85 [B2.1] · Two operations, in order. Multiply first, then subtract.

42 C — 32 [C1.3] · Write out the first six terms of each pattern, then look for the number in all three lists. Do not stop at the first pattern.

43 B — 44 + p = 90 [C2.3] · Solve every single one before choosing. Two of these are within a couple of units of each other, and nearly half of students at Level 2 picked the wrong one of the pair.

44 A — $282 [E2.6] · Two steps. Surface area = 2 × (5×4 + 5×3 + 4×3) = 94 m². Cost = 94 × $3 = $282. Volume would be the wrong measure entirely.