

Chapters 4, 5, 6 and 7

Question papers

Four original practice papers. Each chapter contains eight questions worth 5 marks each: 40 marks per chapter, 160 marks overall. Suggested time: 60 minutes per paper, adjusted to the learner.

4 Probability

Pages 2-5 | 4.1 Likelihood

5 Multiplication, multiples and factors

Pages 6-9 | 5.1 Tables, multiples and factors; 5.2 Multiplication

6 2D shapes

Pages 10-17 | 6.1 2D shapes and tessellation; 6.2 Symmetry

7 Fractions

Pages 18-21 | 7.1 Understanding fractions; 7.2 Fractions as operators

Write your name on the first page of each paper. Answer every part. Show calculations and explain reasoning where asked. Use a pencil, ruler and colouring pencils. A mirror is optional for symmetry. No calculator is needed. R/B/Y labels make colour diagrams usable in black-and-white. Use extra paper if needed. All questions are in this booklet; answers are in the separate solutions booklet.

Syllabus basis: the supplied 27971797.pdf, Cambridge Primary Mathematics, Learner's Book 4, second edition (2021), Mary Wood and Emma Low. Printed pages 54-60, 61-73, 75-86 and 88-98; PDF pages 55-61, 62-74, 76-87 and 89-99. Original questions and drawings aligned to these chapter objectives. This is an independently prepared practice resource, not an official Cambridge examination.

Probability

40 marks | Suggested time: 60 minutes | Paper page 1 of 4 | Questions 1-2

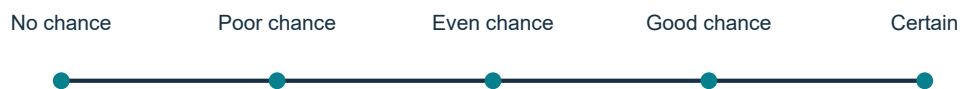
Name: _____ Date: _____ Score: ____ / 40

4.1 The language of chance

[5 marks]

Use each phrase once: no chance, poor chance, even chance, good chance, certain. A fair six-sided die is numbered 1 to 6. Describe the chance of rolling:

a) 8 b) 6 c) an odd number d) a number less than 6 e) a number less than 7. [1 each]



Chance increases from left to right

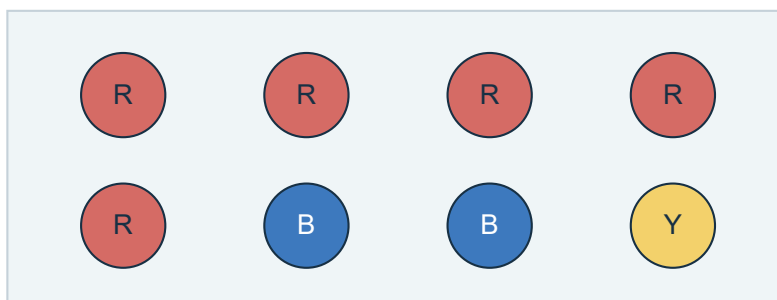
4.2 Counters in a bag

[5 marks]

The bag contains the eight counters shown. They feel identical. One counter is chosen without looking.

a) Which colour is most likely? [1] b) Which is least likely among the colours present? [1]

c) Describe the chance of red, blue and green. [3]



R = red B = blue Y = yellow

Probability

40 marks | Suggested time: 60 minutes | Paper page 2 of 4 | Questions 3-4

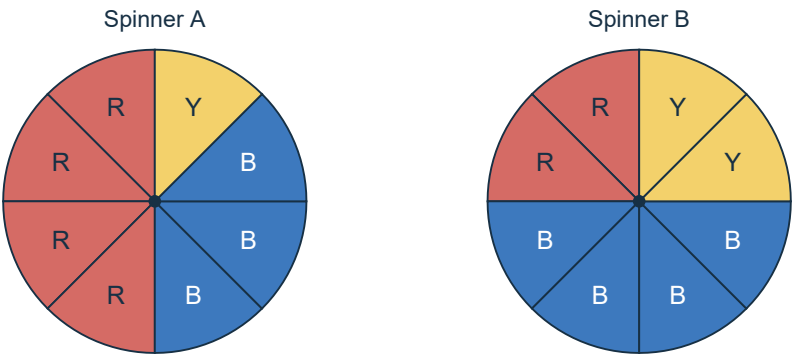
Show working. Use the space provided or extra paper.

4.3 Compare two spinners

[5 marks]

Each fair spinner has eight equal sections. R = red, B = blue, Y = yellow.

- a) Describe the chance of red on A and on B. [2]
- b) Which spinner gives a better chance of yellow? Explain. [2]
- c) Which spinner gives an even chance of blue? [1]

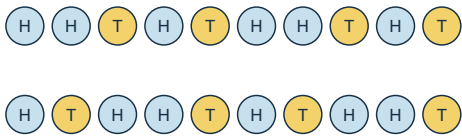


4.4 Record a coin experiment

[5 marks]

These are sample results from 20 flips of a fair coin. H means head and T means tail.

- a) Complete the tally table and totals. [2]
- b) Which result occurred more often, and by how many? [1]
- c) Is the next flip certain to be that result? Explain. [1]
- d) Must 20 new flips give exactly 10 heads? Explain. [1]



Read left to right, top row first.

Result	Tally	Total
Head		
Tail		

Probability

40 marks | Suggested time: 60 minutes | Paper page 3 of 4 | Questions 5-6

Show working. Use the space provided or extra paper.

4.5 A die experiment

[5 marks]

- A fair six-sided die was rolled 30 times in this sample record.
- a) Which number appeared most often? [1]
 - b) How many rolls were odd? [1]
 - c) Describe the chance of rolling an odd number next. [1]
 - d) Is 8 possible next? Explain. [1]
 - e) Does the most frequent result have to appear next? Explain. [1]

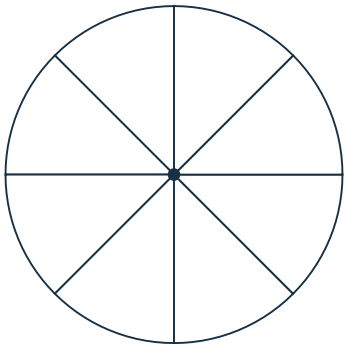
Die face	1	2	3	4	5	6
Count	3	5	4	7	5	6

Sample record: 30 rolls in total

4.6 Design a spinner

[5 marks]

- Colour or label the eight equal sections. Use only red and blue, with at least one of each. Make red have a good chance, blue a poor chance, and green no chance.
- a) Complete the design. [2]
 - b) Explain why red has a good chance. [1]
 - c) Explain why green has no chance. [1]
 - d) Is red certain? Explain. [1]



Probability

40 marks | Suggested time: 60 minutes | Paper page 4 of 4 | Questions 7-8

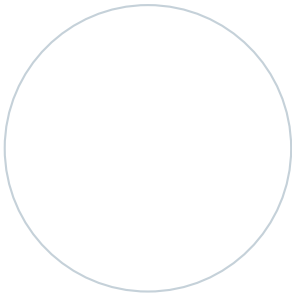
Show working. Use the space provided or extra paper.

4.7 What can results tell us?

[5 marks]

- A hidden spinner produced these 36 sample results: red 11, blue 13, yellow 12, green 0.
- a) Draw one plausible spinner and label its sections. [2]
 - b) Explain how your design fits the results. [1]
 - c) Do these results prove that green is impossible? Explain. [1]
 - d) Must blue occur most often in the next 36 spins? Explain. [1]

Colour	Count
Red	11
Blue	13
Yellow	12
Green	0



Draw your proposed sections.

4.8 Plan a fair investigation

[5 marks]

- A bag holds 2 red and 2 blue counters that feel identical. Plan 20 picks to investigate the colours.
- a) Predict the chance of each colour. [1]
 - b) Explain how to avoid choosing by sight or feel. [1]
 - c) What should you do with a counter after recording it? Why? [1]
 - d) Draw a suitable results table. [1]
 - e) Must the totals be 10 red and 10 blue? Explain. [1]



Draw your recording table here.

Multiplication, multiples and factors

40 marks | Suggested time: 60 minutes | Paper page 1 of 4 | Questions 1-2

Name: _____ Date: _____ Score: ____ / 40

5.1 Table facts and inverse facts

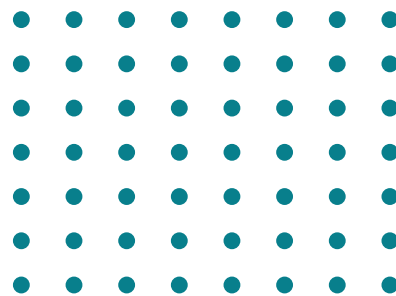
[5 marks]

Complete the calculations. You may use the array to help.

a) $7 \times 8 = \underline{\quad}$ [1] b) $9 \times 6 = \underline{\quad}$ [1]

c) $7 \times \underline{\quad} = 63$ [1] d) $56 \div 7 = \underline{\quad}$ [1]

e) $10 \times 7 = \underline{\quad}$ [1]



7 equal rows

8 counters in each row

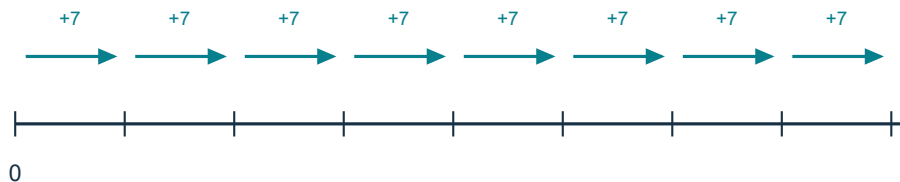
5.2 Recognise multiples

[5 marks]

a) Write the first five positive multiples of 7. Start at 7. [2]

b) Circle every multiple of 7 in this list: 28, 32, 35, 42, 48, 49, 54, 56. [2]

c) A learner says, "All multiples of 5 end in 5." Is this correct? Give a counterexample. [1]



Equal jumps of seven

Multiplication, multiples and factors

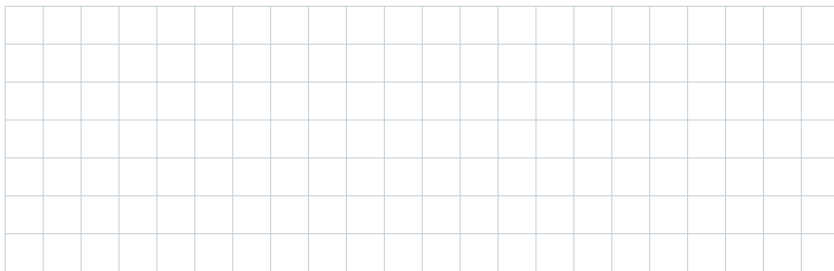
40 marks | Suggested time: 60 minutes | Paper page 2 of 4 | Questions 3-4

Show working. Use the space provided or extra paper.

5.3 Find every factor

[5 marks]

- Write all factor pairs of 24. [2]
- Use your pairs to list all positive factors of 24 in order. [2]
- Draw a rectangular array with 24 dots and label its rows and columns. [1]

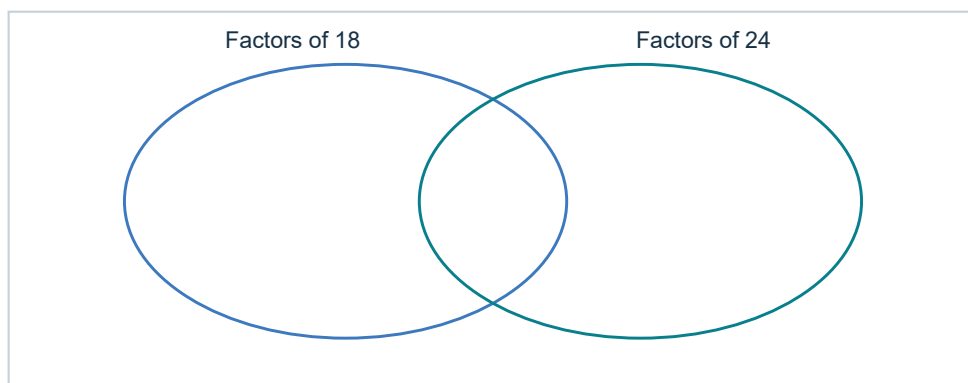


5.4 Sort factors in a Venn diagram

[5 marks]

Place each number once in the Venn diagram: 2, 3, 4, 6, 8, 9, 12, 15.

- Complete all four regions, including outside both circles. [4]
- What is the greatest number placed in the overlap? [1]



Multiplication, multiples and factors

40 marks | Suggested time: 60 minutes | Paper page 3 of 4 | Questions 5-6

Show working. Use the space provided or extra paper.

5.5 Group factors efficiently

[5 marks]

- a) Calculate 14×5 by using $14 = 7 \times 2$. Show how you regroup the factors and explain why it helps. [3]
- b) Calculate $25 \times 4 \times 3$. Show an efficient grouping. [2]

7

×

2

×

5

Choose a helpful pair.

25

×

4

×

3

5.6 Estimate and use a grid

[5 marks]

- Work out 46×7 .
- a) Round 46 to the nearest ten and use it to estimate the product. [1]
 - b) Split 46 into tens and ones. Complete the multiplication grid, then add the partial products. Show your working. [4]

×	Tens	Ones
7		

46 = _____ + _____

Multiplication, multiples and factors

40 marks | Suggested time: 60 minutes | Paper page 4 of 4 | Questions 7-8

Show working. Use the space provided or extra paper.

5.7 Multiply a three-digit number

[5 marks]

- Work out 368×4 .
- a) Estimate by rounding 368 to the nearest hundred. [1]
- b) Use a written method and show all steps. [3]
- c) Should the exact answer be above or below your estimate? Explain. [1]

	Hundreds	Tens	Ones
	3	6	8
×			4

5.8 A packing problem

[5 marks]

- A school needs 1000 pencils. It has 7 boxes, each containing 136 pencils.
- a) Estimate the pencils available by rounding 136 to the nearest ten. [1]
- b) Calculate the exact number available. [2]
- c) Are there enough? How many more are needed, or how many are left over? [2]

136	136	136	136	136	136	136
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Target: 1000 pencils

2D shapes

40 marks | Suggested time: 60 minutes | Paper page 1 of 8 | Question 1

Name: _____ Date: _____ Score: ____ / 40

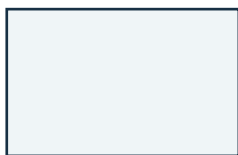
6.1 Properties of shapes

[5 marks]

Use the labelled shapes.

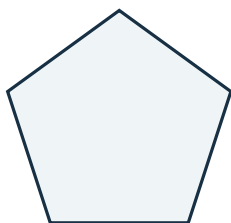
- a) How many sides and vertices does A have? [1]
- b) How many sides and vertices does B have? [1]
- c) Why is D not a polygon? [1]
- d) How many pairs of parallel sides does C have? [1]
- e) What two properties make B a regular polygon? [1]

A



Rectangle

B



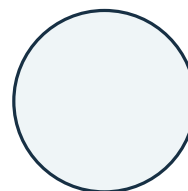
Regular pentagon

C



Parallelogram

D



Circle

Drawing and explanation space

2D shapes

40 marks | Suggested time: 60 minutes | Paper page 2 of 8 | Question 2

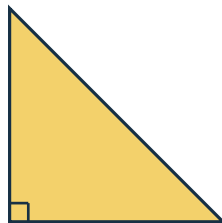
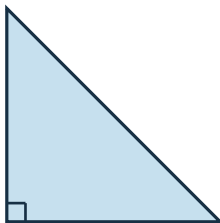
Show working. Use the space provided or extra paper.

6.2 Combine two triangles

[5 marks]

The two identical right-angled triangles each have two equal short sides. Use both pieces each time, with no gaps or overlaps. You may turn or flip them.

- a) Draw how they make a square. Show the join. [2]
- b) Draw how they make one larger triangle. Show the join. [2]
- c) Name the two outside shapes you made. [1]



Identical pieces

Short sides are equal.

Drawing and explanation space

2D shapes

40 marks | Suggested time: 60 minutes | Paper page 3 of 8 | Question 3

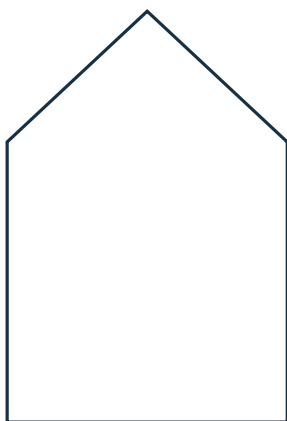
Show working. Use the space provided or extra paper.

6.3 Split a pentagon in two ways

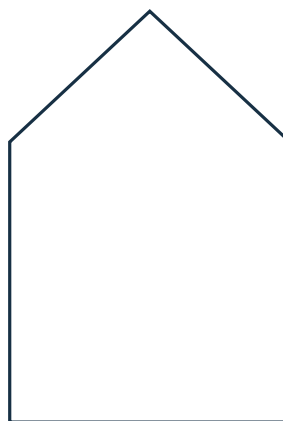
[5 marks]

Two copies of the same house-shaped pentagon are shown.

- a) On the left copy, draw exactly two straight lines to make three triangles. [2]
- b) On the right copy, draw one straight line to make a square and a triangle. [2]
- c) Explain why the outside shape is a pentagon. [1]



a) Three triangles



b) Square and triangle

Drawing and explanation space

2D shapes

40 marks | Suggested time: 60 minutes | Paper page 4 of 8 | Question 4

Show working. Use the space provided or extra paper.

6.4 Which shapes tessellate?

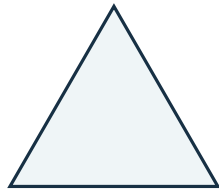
[5 marks]

Decide whether identical copies of each shape can cover a flat surface with no gaps or overlaps. Use only one shape type at a time.

- a) Square [1] b) Equilateral triangle [1]
c) Regular hexagon [1] d) Regular pentagon [1]
e) Explain what makes a pattern a tessellation. [1]



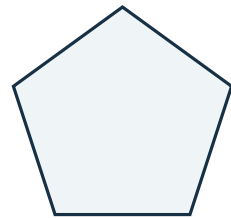
a) Square



b) Triangle



c) Hexagon



d) Pentagon

Drawing and explanation space

2D shapes

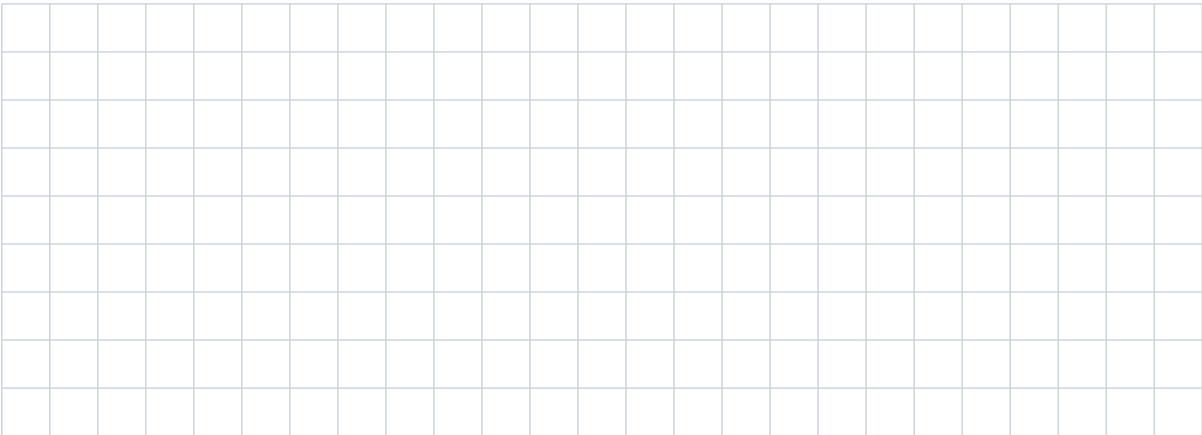
40 marks | Suggested time: 60 minutes | Paper page 5 of 8 | Question 5

Show working. Use the space provided or extra paper.

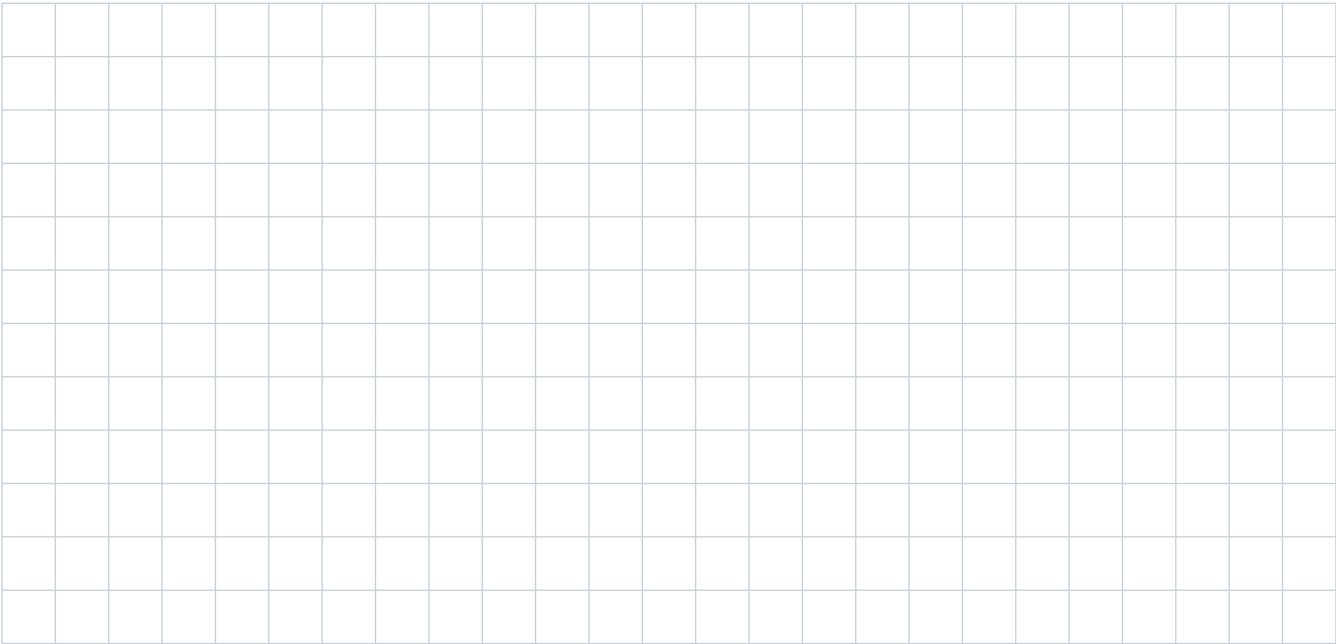
6.5 Draw tessellating patterns

[5 marks]

- Use the square grid below or draw in the working space.
- a) Draw a patch using at least six identical non-square rectangles. [2]
 - b) Draw a patch using at least six identical triangles. [2]
 - c) Explain how each patch could be continued. [1]



Drawing and explanation space



2D shapes

40 marks | Suggested time: 60 minutes | Paper page 6 of 8 | Question 6

Show working. Use the space provided or extra paper.

6.6 Find every line of symmetry

[5 marks]

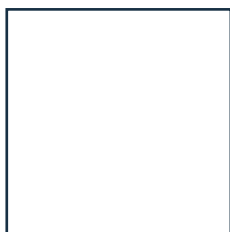
Draw all lines of symmetry on each shape and write the number of lines.

a) Square [2]

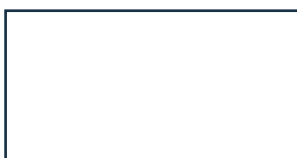
b) Rectangle that is not a square [1]

c) Rhombus that is not a square [2]

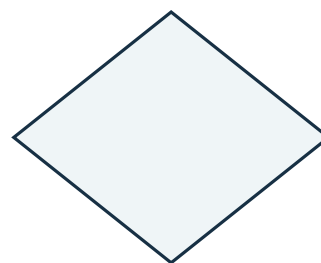
Use a ruler. Dashed lines may help your drawing stay clear.



a) Square



b) Rectangle



c) Rhombus

Drawing and explanation space

2D shapes

40 marks | Suggested time: 60 minutes | Paper page 7 of 8 | Question 7

Show working. Use the space provided or extra paper.

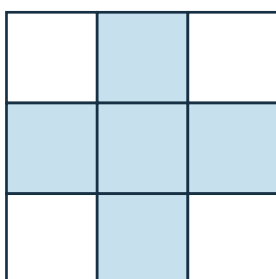
6.7 Symmetry in shaded patterns

[5 marks]

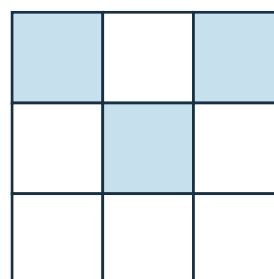
Treat shaded and unshaded squares as part of each design.

- a) Draw all lines of symmetry of pattern A and state the number. [2]
- b) Do the same for pattern B. [2]
- c) Explain why checking only the outside square can give a wrong answer. [1]

Pattern A



Pattern B



Drawing and explanation space

2D shapes

40 marks | Suggested time: 60 minutes | Paper page 8 of 8 | Question 8

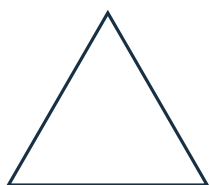
Show working. Use the space provided or extra paper.

6.8 Regular polygons and a conjecture

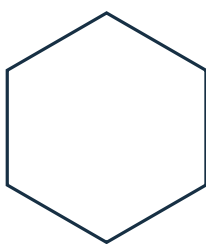
[5 marks]

a) How many lines of symmetry does each regular polygon have: equilateral triangle, regular hexagon, regular octagon? [3]

b) A learner says, "Every six-sided polygon has six lines of symmetry." Is this true? Use the stretched hexagon D to explain. [2]



A: triangle



B: hexagon



C: octagon



D: stretched hexagon

Drawing and explanation space

Fractions

40 marks | Suggested time: 60 minutes | Paper page 1 of 4 | Questions 1-2

Name: _____ Date: _____ Score: ____ / 40

7.1 Read and draw fractions

[5 marks]

- a) In $\frac{3}{8}$, name the numerator and denominator and explain what each tells you about a divided whole. [2]
 b) Shade $\frac{3}{8}$ of the strip. [1]
 c) Circle the unit fractions: $\frac{1}{5}$, $\frac{2}{5}$, $\frac{1}{9}$, $\frac{4}{9}$. [1]
 d) What makes a fraction a unit fraction? [1]

One whole split into eight equal parts



Shade three of the equal parts.

7.2 Equal parts matter

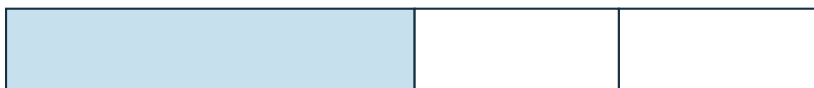
[5 marks]

- a) Strip A has six equal parts. What fraction is shaded? [1]
 b) Strip B has three unequal parts. A learner calls the shaded part $\frac{1}{3}$. Explain the error. [2]
 c) What fraction of B is actually shaded? Explain using the equal-sized whole strips. [2]

A



B



Fractions

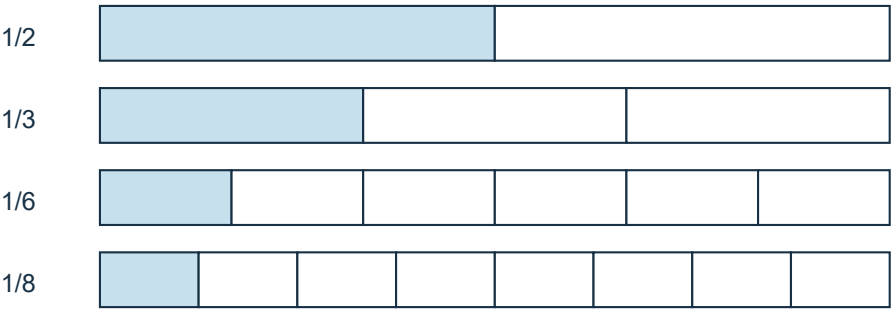
40 marks | Suggested time: 60 minutes | Paper page 2 of 4 | Questions 3-4

Show working. Use the space provided or extra paper.

7.3 Compare fraction sizes

[5 marks]

- All fractions refer to wholes of the same size.
- a) Put these in order, smallest first: $\frac{1}{2}$, $\frac{1}{8}$, $\frac{1}{3}$, $\frac{1}{6}$. [2]
- b) Put these in order, smallest first: $\frac{3}{4}$, $\frac{3}{12}$, $\frac{3}{8}$. [2]
- c) Explain why a larger denominator gives a smaller fraction in both lists. [1]



All strips show the same-sized whole.

7.4 Fractions on a number line

[5 marks]

- The distance from 0 to 1 is divided into ten equal intervals.
- a) Mark and label $\frac{1}{10}$, $\frac{4}{10}$, $\frac{1}{2}$ and $\frac{9}{10}$ on the line. [4]
- b) Write $\frac{1}{2}$ as a fraction with denominator 10. [1]

Ten equal intervals from 0 to 1



Fractions

40 marks | Suggested time: 60 minutes | Paper page 3 of 4 | Questions 5-6

Show working. Use the space provided or extra paper.

7.5 Sharing is division

[5 marks]

Five children share three identical cakes equally. All three cakes are used.

- a) Write the division calculation. [1]
- b) What fraction of one cake does each child receive? [1]
- c) Draw how all three cakes can be shared equally. [2]
- d) Explain how your drawing checks the answer. [1]

Cake 1

--	--	--	--	--

Cake 2

--	--	--	--	--

Cake 3

--	--	--	--	--

7.6 Fractions of quantities

[5 marks]

Calculate each amount. Show division first; for e, show the extra step needed.

- a) $\frac{1}{3}$ of 42 [1] b) $\frac{1}{5}$ of 45 [1]
- c) $\frac{1}{8}$ of 64 [1] d) $\frac{1}{10}$ of 90 [1]
- e) $\frac{3}{4}$ of 32 [1]

One whole quantity: 32

--	--	--	--

Use four equal groups to find quarters.

Fractions

40 marks | Suggested time: 60 minutes | Paper page 4 of 4 | Questions 7-8

Show working. Use the space provided or extra paper.

7.7 Halve a recipe

[5 marks]

This recipe makes 12 small cakes: 240 g flour, 100 g butter, 60 g sugar and 120 ml milk.

- a) Find the amount of each ingredient for 6 small cakes. [4]
- b) Explain why you use the same fraction for all four ingredients. [1]

Ingredient	For 12 cakes	For 6 cakes
Flour	240 g	
Butter	100 g	
Sugar	60 g	
Milk	120 ml	

Keep the units in your answers.

7.8 Compare amounts and find the whole

[5 marks]

- a) Calculate $\frac{1}{2}$ of 36 tokens and $\frac{1}{3}$ of 63 tokens. [2]
- b) Which gives more, and by how many tokens? [1]
- c) One quarter of a different bag is 9 tokens. How many tokens are in the whole bag? [1]
- d) Explain how you found the whole bag in c. [1]

1/2 of 36

1/3 of 63

1/4 of ? = 9