

Additional training papers

Questions and drawing practice

Twelve new short papers, containing 48 questions and 240 marks in total. Each chapter has a Foundation paper, a Practice paper and a Challenge paper. Every paper has four questions worth 5 marks each.

Set A / Foundation

Pages 3-12

Foundation: build confidence with short hints and visual models.

Set B / Practice

Pages 13-22

Practice: work independently, then explain and check your method.

Set C / Challenge

Pages 23-32

Challenge: repair mistakes, find possibilities and justify conclusions.

Work through A, B and C in order for each chapter, or choose one short paper at a time. Start Foundation untimed if helpful. Use a pencil, ruler and colouring pencils; a mirror is optional for symmetry. Show working and include units. Use the progress table on page 2 to choose what to revisit. Geometry pages provide large drawing areas.

Based on the supplied 27971797.pdf: Cambridge Primary Mathematics, Learner's Book 4, second edition (2021), Mary Wood and Emma Low. Scope: 4.1 Likelihood; 5.1 Tables, multiples and factors; 5.2 Multiplication; 6.1 2D shapes and tessellation; 6.2 Symmetry; 7.1 Understanding fractions; 7.2 Fractions as operators. Printed pages 54-60, 61-73, 75-86 and 88-98. These are original supplementary papers, independently prepared; they are not official Cambridge examinations.

Training map and progress record

Name: _____

Each short paper is out of 20. After marking, redo one missed question and explain the method aloud. Use the same question ID to find its solution.

Paper	Topic	Q pages	Solution pages	Score / 20	Date
A4	Probability	3-4	2-5		
A5	Multiplication / factors	5-6	6-9		
A6	2D shapes / symmetry	7-10	10-13		
A7	Fractions	11-12	14-17		
B4	Probability	13-14	18-21		
B5	Multiplication / factors	15-16	22-25		
B6	2D shapes / symmetry	17-20	26-29		
B7	Fractions	21-22	30-33		
C4	Probability	23-24	34-37		
C5	Multiplication / factors	25-26	38-41		
C6	2D shapes / symmetry	27-30	42-45		
C7	Fractions	31-32	46-49		

A useful routine: attempt → mark → explain → retry. Use the blank space below to note topics that need another try. The score is a practice guide, not an official grade boundary.

Probability

Paper A4 | 20 marks | Four questions | Suggested time: 25-35 minutes

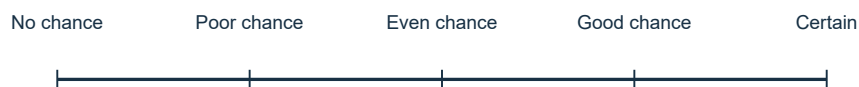
Name: _____ Date: _____ Score: ____ / 20

A4.1 Choose a chance word

[5 marks]

A fair die has faces numbered 1 to 6. Use no chance, poor chance, even chance, good chance or certain. Describe the chance of: a) 0; b) 2; c) an even number; d) a number greater than 1; e) a number at most 6. [1 each]

Hint: Count the faces that work, then the faces that do not.



From impossible to certain

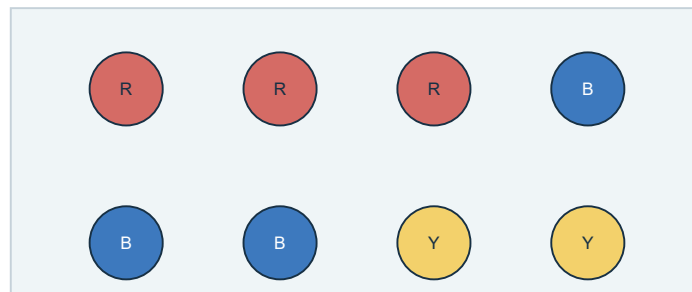
A4.2 Read a bag of counters

[5 marks]

All counters feel identical. One is picked without looking. R = red, B = blue, Y = yellow.

- a) Which two colours are equally likely? [1] b) Which colour present is least likely? [1]
 c) Describe the chance of red or blue. [1] d) Describe the chance of green. [1] e) Is getting one of R, B or Y certain? [1]

Hint: Compare counts; do not use the positions of the counters.



R = red B = blue Y = yellow

Probability

Paper A4 | 20 marks | Four questions | Suggested time: 25-35 minutes

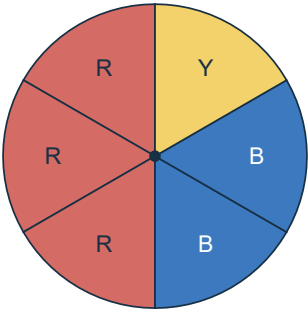
Show working. Explain your reasoning where asked.

A4.3 A six-section spinner

[5 marks]

This fair spinner has six equal sections. R = red, B = blue, Y = yellow.
Describe the chance of: a) red; b) blue; c) yellow; d) green; e) red or blue. Use chance words. [1 each]

Hint: Equal chance means equal amounts of the circle.



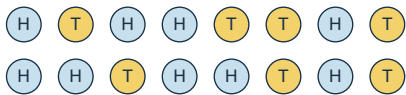
Six equal sections

A4.4 Tally sixteen coin flips

[5 marks]

The diagram is a sample record of 16 flips of a fair coin: H = head, T = tail.
a) Complete the tally table and totals. [2] b) Which occurred more often, and by how many? [1]
c) What is the chance of a head next? [1] d) Must 16 more flips give 8 heads? Explain. [1]

Hint: A tally bundle represents five. Check that your totals add to 16.



Read the top row first.

Result	Tally	Total
H		
T		

Multiplication, multiples and factors

Paper A5 | 20 marks | Four questions | Suggested time: 25-35 minutes

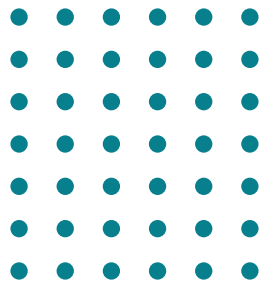
Name: _____ Date: _____ Score: ____ / 20

A5.1 Build your seven-times table

[5 marks]

Use the array if it helps. Complete: a) 7×6 ; b) 7×9 ; c) 8×7 ; d) $42 \div 7$; e) ____ $\times 7 = 35$. [1 each]

Hint: Division and multiplication undo one another.



7 equal rows

6 in each row

A5.2 Recognise multiples

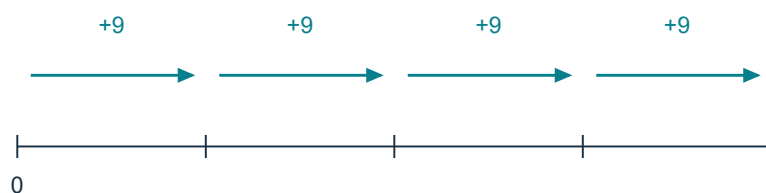
[5 marks]

a) Write the first four positive multiples of 9, starting at 9. [2]

b) Circle the multiples of 6: 18, 22, 24, 30, 35, 36. [2]

c) Explain why 35 is not a multiple of 6. [1]

Hint: A positive multiple comes from multiplying by 1, 2, 3 and so on.



2D shapes

Paper A6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Name: _____ Date: _____ Score: ____ / 20

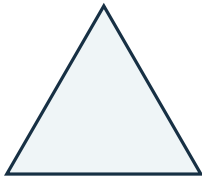
A6.1 Sides, vertices and boundaries

[5 marks]

Use shapes A-D.

- a) Give the number of sides and vertices of A. [1] b) Do the same for B. [1]
c) How many pairs of parallel sides does C have? [1] d) Why is D not a polygon? [1]
e) What makes B a regular polygon? Give both properties. [1]

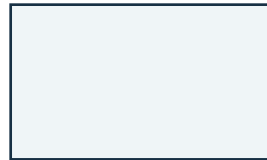
Hint: A vertex is a corner. Polygons have only straight sides.



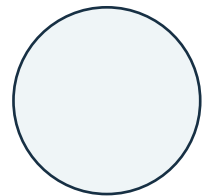
A: triangle



B: regular hexagon



C: rectangle



D: circle

Drawing and explanation space

2D shapes

Paper A6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

A6.2 Two different cuts

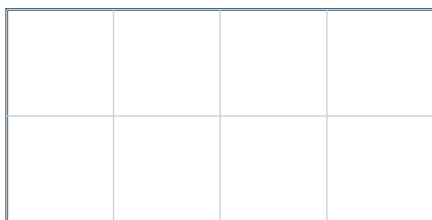
[5 marks]

Each rectangle is four grid squares long and two high.

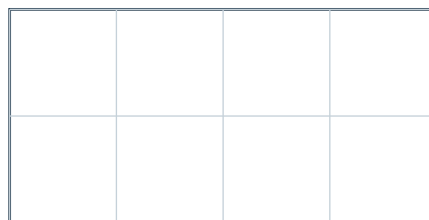
- a) On the left, draw one straight cut to make two squares. [2]
- b) On the right, draw one straight cut to make two triangles. [2]
- c) Name the outside shape before it is cut. [1]

Hint: For a square, the length and height must match.

a) Two squares



b) Two triangles



Drawing and explanation space

2D shapes

Paper A6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

A6.3 Look for gaps

[5 marks]

The drawings are small patches of repeating patterns.

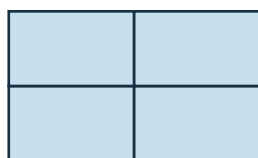
a) Does each of A, B and C make a tessellation if continued in the same way? [3]

b) Explain your answer for A. [1]

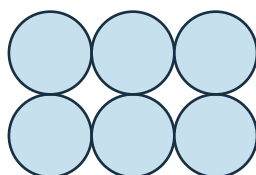
c) Explain your answer for B. [1]

Hint: A small outer boundary is expected. Look for gaps inside the patch.

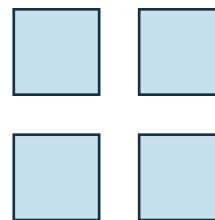
A



B



C



Drawing and explanation space

2D shapes

Paper A6 | 20 marks | Four questions | Suggested time: 25-35 minutes

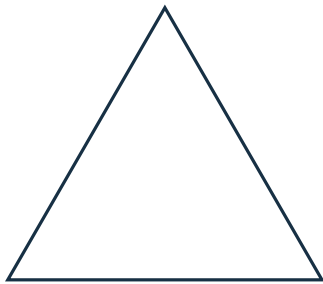
Show working. Explain your reasoning where asked.

A6.4 Fold lines in regular shapes

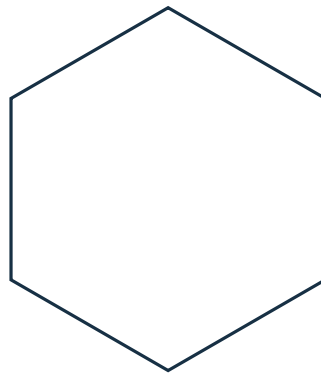
[5 marks]

- a) Draw every line of symmetry of the equilateral triangle and write the number. [2]
- b) Do the same for the regular hexagon. [2]
- c) Explain the fold test for a line of symmetry. [1]

Hint: Test slanted lines as well as vertical and horizontal lines.



3 sides



6 sides

Drawing and explanation space

Fractions

Paper A7 | 20 marks | Four questions | Suggested time: 25-35 minutes

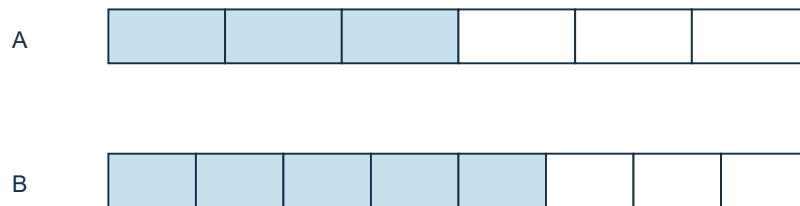
Name: _____ Date: _____ Score: ____ / 20

A7.1 Name the shaded fractions

[5 marks]

- a) Write the shaded fraction of strip A and strip B. [2]
 b) In $\frac{5}{8}$, identify the numerator and denominator. [2]
 c) Circle the unit fractions: $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{6}$, $\frac{5}{6}$. [1]

Hint: Include shaded and unshaded parts when counting the denominator.



Equal-sized whole strips

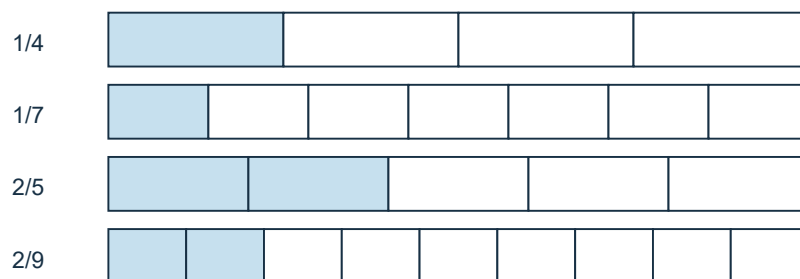
A7.2 Compare equal-sized wholes

[5 marks]

All wholes have the same size.

- a) Which is larger: $\frac{1}{4}$ or $\frac{1}{7}$? [1] b) Which is larger: $\frac{2}{5}$ or $\frac{2}{9}$? [1]
 c) Order $\frac{1}{2}$, $\frac{1}{5}$ and $\frac{1}{10}$ from smallest to largest. [2]
 d) Explain your rule. [1]

Hint: Keep the number of selected pieces the same when using this rule.



Equal-sized whole strips

Fractions

Paper A7 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

A7.3 Find one equal share

[5 marks]

Show a division calculation for each.
a) $\frac{1}{2}$ of 46; b) $\frac{1}{3}$ of 27; c) $\frac{1}{4}$ of 52; d) $\frac{1}{5}$ of 60; e) $\frac{1}{10}$ of 80. [1 each]
Hint: To find $\frac{1}{n}$ of a quantity, divide by n.

Whole quantity: 52

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A7.4 Share two pizzas

[5 marks]

Three friends share two identical pizzas equally, using all the pizza.
a) Write the division. [1] b) What fraction of one pizza does each get? [1]
c) Draw an equal sharing on the two pizza models. [2]
d) Explain how your drawing checks the answer. [1]
Hint: Cut both pizzas into thirds, then label each friend's pieces.

Pizza 1

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Pizza 2

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Probability

Paper B4 | 20 marks | Four questions | Suggested time: 25-35 minutes

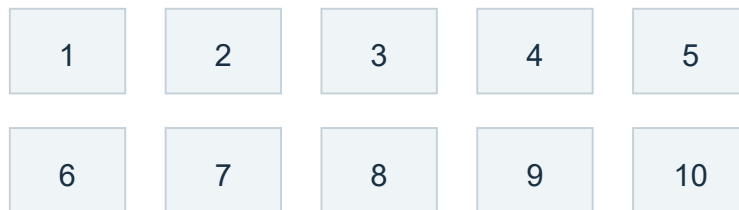
Name: _____ Date: _____ Score: ____ / 20

B4.1 Number cards and chance

[5 marks]

Ten identical cards are numbered 1 to 10. They are mixed and one is chosen without looking.

Describe the chance of: a) an odd number; b) a number greater than 7; c) a number less than 9; d) 10; e) 11. [1 each]



B4.2 Does a bigger bag help?

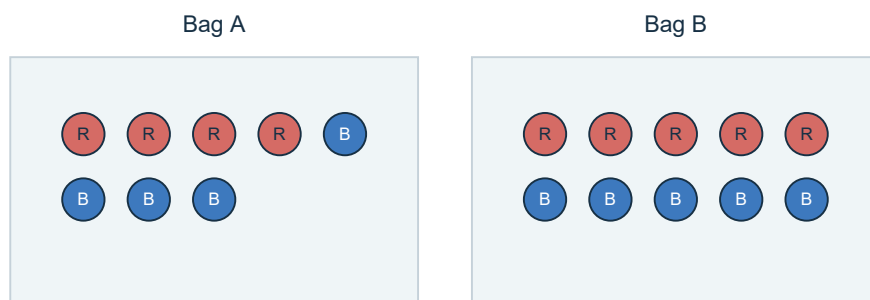
[5 marks]

Bag A has 4 red and 4 blue counters. Bag B has 5 red and 5 blue. Counters feel identical; choose unseen.

a) Describe the chance of red in A. [1] b) Do the same for B. [1]

c) Does B give a better chance of red? Explain. [2]

d) Is a red counter certain from either bag? [1]



Probability

Paper B4 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

B4.3 Read a spinner record

[5 marks]

These are sample counts from repeated spins of a hidden spinner: red 9, blue 8, yellow 7.

- a) How many spins were recorded? [1] b) Which colour occurred most? [1]
 c) How many more reds than yellows? [1]
 d) Must red occur most often in the next set of spins? Explain. [2]

Colour	Sample count
Red	9
Blue	8
Yellow	7

B4.4 Plan eighteen die rolls

[5 marks]

Plan an investigation using a fair die numbered 1 to 6.

- a) Predict the chance of an odd result. [1] b) Draw a table with rows for possible results and space for tally and total. [1]
 c) Explain how you will record all 18 rolls accurately. [1]
 d) Must each face occur exactly 3 times? Explain. [1]
 e) Why should a row for 7 stay at zero? [1]

Draw your own recording table.

Multiplication, multiples and factors

Paper B5 | 20 marks | Four questions | Suggested time: 25-35 minutes

Name: _____ Date: _____ Score: ____ / 20

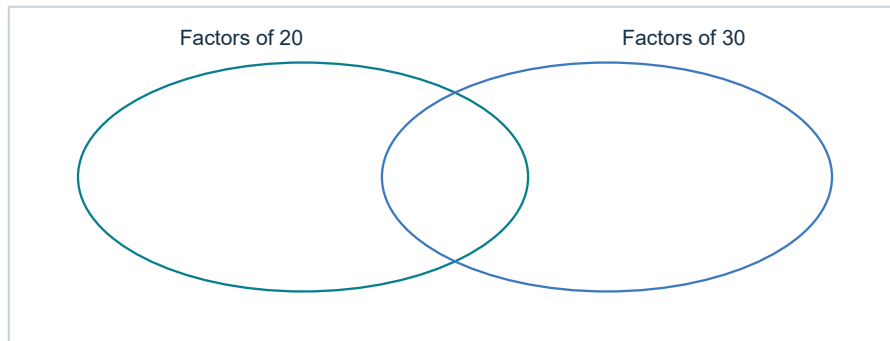
B5.1 Factor sorting

[5 marks]

Place these numbers in the Venn diagram: 1, 2, 3, 4, 5, 6, 7, 10, 15, 20, 30.

a) Fill all four regions, including outside both circles. [4]

b) What is the greatest number in the overlap? [1]



B5.2 Regroup to make easy facts

[5 marks]

a) Use $18 = 9 \times 2$ to calculate 18×5 . Show the regrouping and explain why it helps. [3]

b) Calculate $4 \times 25 \times 7$ with an efficient grouping. [2]

18×5	→	Your grouping
$4 \times 25 \times 7$	→	Your grouping

Multiplication, multiples and factors

Paper B5 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

B5.3 A larger written multiplication

[5 marks]

- Calculate 427×6 .
- a) Estimate by rounding 427 to the nearest hundred. [1]
 - b) Show a complete written method. [3]
 - c) Explain whether the exact answer should be above or below your estimate. [1]

×	Hundreds	Tens	Ones
6			

427 = ____ + ____ + ____

B5.4 Tickets in packets

[5 marks]

- A fair needs 1200 tickets. There are 8 packets of 124 tickets.
- a) Estimate the tickets available by rounding 124 to the nearest ten. [1]
 - b) Calculate the exact number available. [2]
 - c) Are there enough? Find the shortage or surplus. [2]

124	124	124	124	124	124	124	124
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Target: 1200 tickets

2D shapes

Paper B6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Name: _____ Date: _____ Score: ____ / 20

B6.1 Divide a hexagon into triangles

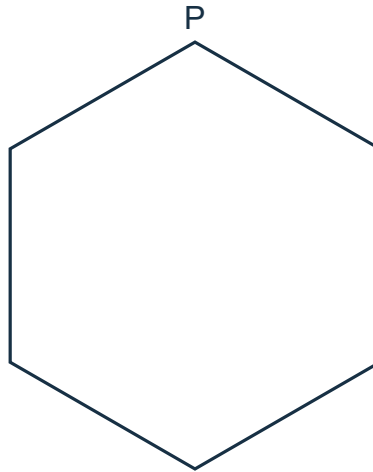
[5 marks]

Use the marked vertex P.

a) Draw three straight lines from P to other vertices to divide the hexagon into four triangles. [3]

b) Write the number of triangles made. [1]

c) How many sides does the outside boundary still have? [1]



Drawing and explanation space

2D shapes

Paper B6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

B6.2 Tessellate a parallelogram

[5 marks]

The tile is a slanted parallelogram.

a) Draw a patch using at least six identical copies. Show every tile boundary. [4]

b) Explain how to continue the pattern without gaps or overlaps. [1]



Repeat this same tile.

Drawing and explanation space

2D shapes

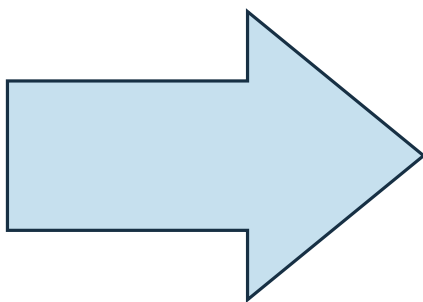
Paper B6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

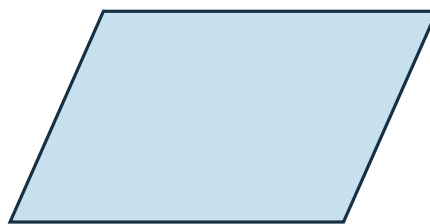
B6.3 An arrow and a parallelogram

[5 marks]

- a) Draw the symmetry line of the arrow and state the number of lines. [2]
- b) State the number of lines of symmetry of the slanted parallelogram and explain your answer. [2]
- c) Is “every quadrilateral has four lines of symmetry” true or false? [1]



Arrow



Parallelogram

Drawing and explanation space

2D shapes

Paper B6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

B6.4 Look for diagonal symmetry

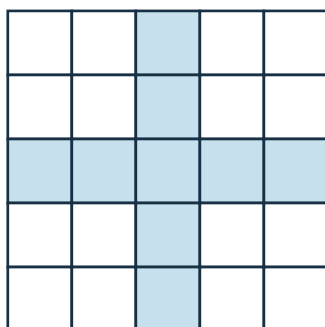
[5 marks]

a) Draw all symmetry lines of pattern A and state the number. [2]

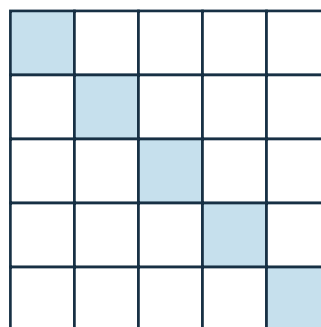
b) Do the same for pattern B. [2]

c) Explain why the vertical line is not a symmetry line of B. [1]

Pattern A



Pattern B



Drawing and explanation space

Fractions

Paper B7 | 20 marks | Four questions | Suggested time: 25-35 minutes

Name: _____ Date: _____ Score: ____ / 20

B7.1 Eighths on a number line

[5 marks]

The interval from 0 to 1 has eight equal parts.

a) Mark and label $\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{7}{8}$. [4]

b) Write $\frac{1}{2}$ with denominator 8. [1]



B7.2 Fractions need not be in one block

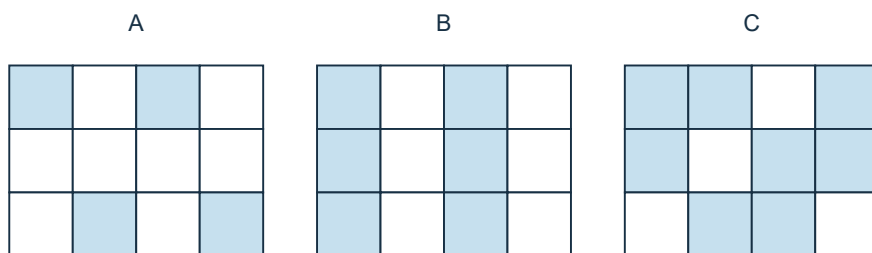
[5 marks]

Each whole grid has twelve equal squares.

a) Write the shaded fraction in A, B and C using denominator 12. [3]

b) Which grid has one half shaded? [1]

c) Can separated shaded squares represent one fraction? Explain. [1]



Fractions

Paper B7 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

B7.3 One part, then three parts

[5 marks]

- Show your method.
- a) Find $\frac{1}{6}$ of 54. [1] b) Find $\frac{1}{8}$ of 72. [1] c) Find $\frac{1}{10}$ of 130. [1]
- d) Find $\frac{3}{4}$ of 48. Show both steps. [2]

Whole quantity: 48

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B7.4 A quarter-sized recipe

[5 marks]

- A recipe makes 20 biscuits using 320 g flour, 160 g butter, 80 g sugar and 200 ml milk.
- a) Find all four amounts for 5 biscuits. Include units. [4]
- b) Explain which fraction you used and why. [1]

Ingredient	For 20	For 5
Flour	320 g	
Butter	160 g	
Sugar	80 g	
Milk	200 ml	

Write the amounts with their units.

Probability

Paper C4 | 20 marks | Four questions | Suggested time: 25-35 minutes

Name: _____ Date: _____ Score: ____ / 20

C4.1 Unequal spinner sections

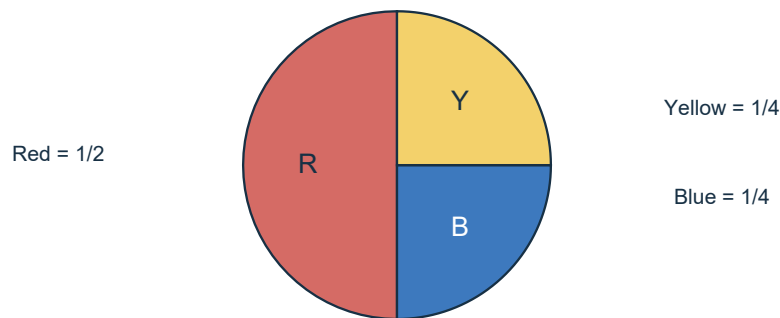
[5 marks]

The red section is half the circle. Blue and yellow are each one quarter. The spinner is fair.

a) Describe the chance of red. [1] b) Compare blue and yellow. [1]

c) A learner says each colour has the same chance because there are three colours. Is this correct? Explain. [2]

d) Is red certain? [1]



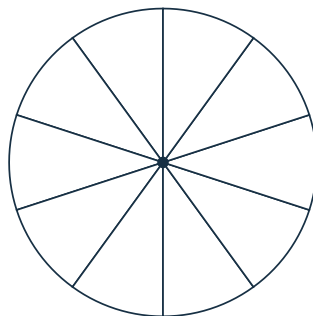
C4.2 Find every possible red count

[5 marks]

A fair spinner has ten equal sections. Use red, blue and yellow, with at least one section of each. Red must have a good chance; blue and yellow must each have a poor chance.

a) Draw one valid design. [2]

b) List every possible number of red sections and explain why your list is complete. [3]



Probability

Paper C4 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

C4.3 A hidden bag: evidence or proof?

[5 marks]

A hidden bag contains five counters. Each pick is recorded, replaced and mixed. In 40 sample picks there are 32 reds and 8 blues; no green is seen.

- Suggest a plausible five-counter bag and explain. [2]
- Does the record prove its exact contents? [1]
- Does no green prove green is impossible? [1]
- Could the next pick be blue? [1]

Colour	Sample count
Red	32
Blue	8
Green	0



Suggest five counter colours.

C4.4 Is a head due?

[5 marks]

A fair coin gives T, T, T, T, T in five flips.

- Describe the chance of a head on the next flip. [1]
- "A head must come next to balance the results." Explain why this is wrong. [2]
- Was the run of five tails impossible? [1]
- Must ten more flips contain exactly five heads? [1]



Five earlier flips



Next flip

Name: _____ Date: _____ Score: ____ / 20

[5 marks]

[5 marks]

×	50	7
8	400	54

Multiplication, multiples and factors

Paper C5 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

C5.3 Make the greatest product

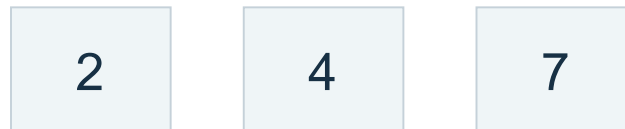
[5 marks]

Use the digits 2, 4 and 7 exactly once to make a two-digit number multiplied by a one-digit number.

a) List all six possible calculations. [2]

b) Find the greatest product. [1]

c) Explain how your search shows that none is larger. [2]



— — × —

C5.4 Two missing-digit solutions

[5 marks]

Each question mark stands for one digit. The two question marks need not have the same value.

Find every solution to $3?6 \times 4 = 1?64$.

a) Write two complete correct calculations. [4]

b) Explain why there are no other possibilities. [1]

$$3 ? 6 \times 4 = 1 ? 6 4$$

Each ? is one digit.

2D shapes

Paper C6 | 20 marks | Four questions | Suggested time: 25-35 minutes

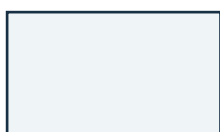
Name: _____ Date: _____ Score: ____ / 20

C6.1 Always, sometimes or never?

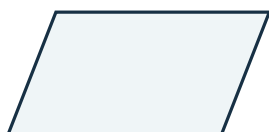
[5 marks]

Classify each statement and justify your answer.

- a) A quadrilateral has four right angles. [2]
- b) A regular polygon has as many lines of symmetry as sides. [1]
- c) A triangle has three lines of symmetry. [2]



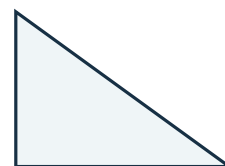
Rectangle



Parallelogram



Equilateral



Scalene

Drawing and explanation space

2D shapes

Paper C6 | 20 marks | Four questions | Suggested time: 25-35 minutes

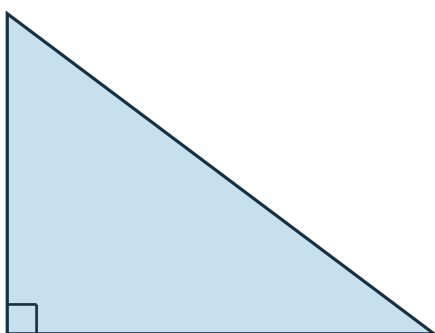
Show working. Explain your reasoning where asked.

C6.2 An irregular triangle can tile

[5 marks]

The triangle has unequal side lengths.

- Can identical copies tessellate? [1]
- Draw a patch of at least six copies, showing each tile boundary. [2]
- Explain why your patch has no gaps or overlaps. [1]
- Must a triangle be regular to tessellate? [1]



Drawing and explanation space

2D shapes

Paper C6 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

C6.3 Design exactly one symmetry line

[5 marks]

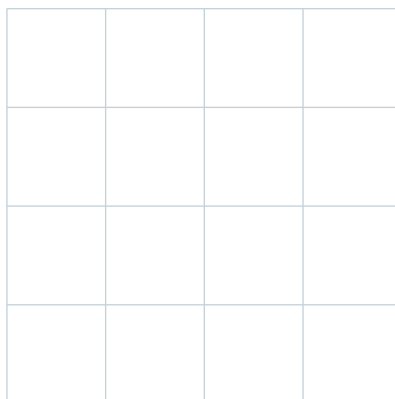
Shade some cells of the 4-by-4 grid to make a pattern with exactly one line of symmetry, which must be vertical.

a) Complete a valid shaded design. [2]

b) Draw its symmetry line. [1]

c) Explain why a horizontal line does not work. [1]

d) Explain why neither diagonal works. [1]



Drawing and explanation space

2D shapes

Paper C6 | 20 marks | Four questions | Suggested time: 25-35 minutes

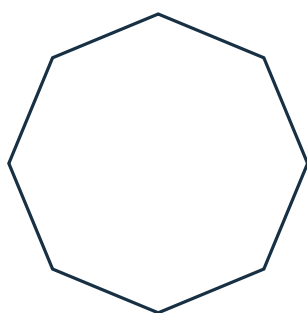
Show working. Explain your reasoning where asked.

C6.4 Same side count, different symmetry

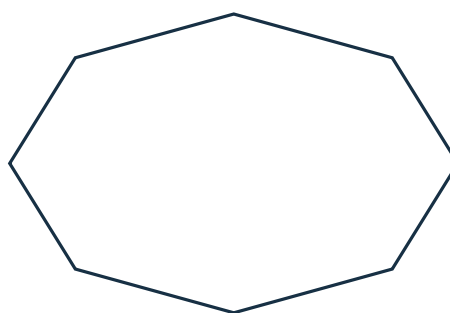
[5 marks]

A is a regular octagon. B is a horizontally stretched copy.

- a) How many vertices does each have? [1]
- b) Draw all symmetry lines on each and state their numbers. [2]
- c) Complete: a regular polygon has the same number of symmetry lines as _____. [1]
- d) Why can this rule not be applied to every eight-sided polygon? [1]



A: regular



B: stretched

Drawing and explanation space

Fractions

Paper C7 | 20 marks | Four questions | Suggested time: 25-35 minutes

Name: _____ Date: _____ Score: ____ / 20

C7.1 Compare shares of different amounts

[5 marks]

- a) Calculate $\frac{1}{4}$ of 84 and $\frac{1}{3}$ of 57. [2]
 b) Which amount is greater, and by how much? [1]
 c) Explain why looking only at $\frac{1}{4}$ and $\frac{1}{3}$ could mislead you here. [1]
 d) If the wholes were the same size, which fraction would be greater? [1]

 $\frac{1}{4}$ of 84

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 $\frac{1}{3}$ of 57

--	--	--

Both whole bars use the same scale.

C7.2 Recover the whole amount

[5 marks]

Find the missing whole numbers.

- a) $\frac{1}{5}$ of ____ = 11. [1] b) $\frac{1}{8}$ of ____ = 7. [1] c) $\frac{1}{3}$ of ____ = 16. [1]
 d) Show how you found and checked one of your answers. [1]
 e) Which of the three whole numbers is greatest? [1]

One fifth = 11

11	?	?	?	?
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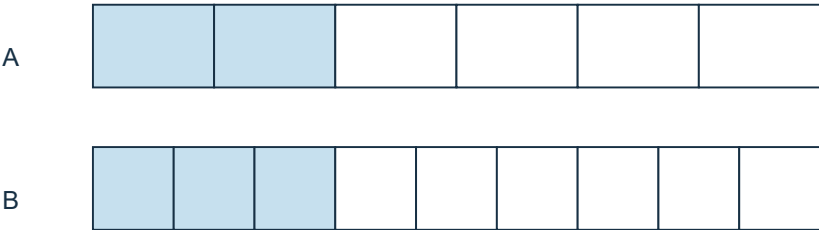
Fractions

Paper C7 | 20 marks | Four questions | Suggested time: 25-35 minutes

Show working. Explain your reasoning where asked.

C7.3 Different partitions, same amount [5 marks]

- The two whole strips are equal in size.
- a) Write the shaded fractions using the displayed parts. [2]
 - b) Is A greater, B greater, or are they equal? [1]
 - c) Explain by grouping each strip into three equal larger parts. Mark these groups on the strips. [2]



C7.4 Two ways to make equal shares [5 marks]

- Use the number cards 12, 18, 24, 36, 48 and 60 to fill A, B and C so that:
 $\frac{1}{2}$ of A = $\frac{1}{3}$ of B = $\frac{1}{4}$ of C.
- Use three different cards within each solution; cards may be reused in the second solution.
- a) Find one solution. [2]
 - b) Find a different solution. [2]
 - c) Check both by division. [1]

Solution	A	B	C	Share
1				
2				

$\frac{1}{2}$ of A = $\frac{1}{3}$ of B = $\frac{1}{4}$ of C