

Primary 4 · Mathematics · P4 Advanced Papers

Mathematics practice 1

Time **60 min** Marks **45** Questions **30**

Answers are printed in red after each question, with the working where it matters. Marks in brackets show how a marker would split them.

Section A

15 marks

Questions 1 to 15 carry 1 mark each.

- 1 Round 4738 to the nearest ten.

[1]

ANSWER **4740**

- 2 A kitchen scale is marked in kilograms from 0 to 5, with a mark every 0.5 kg. The pointer for a tin of rice rests exactly halfway between the 2.5 mark and the 3 mark. What is the mass of the tin, as a decimal?

[1]

ANSWER **2.75 kg**

- 3 How many prime numbers are less than 23?

[1]

1. The primes below 23 are 2, 3, 5, 7, 11, 13, 17 and 19, which is 8.
2. 1 is not prime. $21 = 3 \times 7$ and $22 = 2 \times 11$, so neither is prime.

ANSWER **8 prime numbers**

- 4 Find the missing number: $4\frac{1}{4} - \frac{?}{8} = 1\frac{3}{8}$.

[1]

$$1. 4\frac{1}{4} = \frac{34}{8} \text{ and } 1\frac{3}{8} = \frac{11}{8}$$

$$2. \frac{34}{8} - \frac{11}{8} = \frac{23}{8}, \text{ so the missing numerator is 23.}$$

ANSWER **23**

- 5 In 352.76, the digit 7 is in the _____ place.

[1]

ANSWER **tenths**

- 6** Round 28.996 to 2 decimal places. [1]
- The third decimal digit is 6, so round the second decimal digit up.
 - 28.996 rounds to 29.00. The two zeros show that the answer is given to 2 decimal places.
- ANSWER 29.00**
- 7** The daily wages of six workers at a bakery are \$42, \$35, \$42, \$38, \$42 and \$50. What is the mode? [1]
- \$42 appears three times, which is more often than any other wage.
- ANSWER \$42**
- 8** Two parallel lines are cut by one transversal. The angles at the upper intersection are p (top left), q (top right), r (bottom right) and s (bottom left). The angles at the lower intersection are w (top left), x (top right), y (bottom right) and z (bottom left). Write down one pair of alternate angles. [1]
- ANSWER angle q and angle z**
- Also accept angle s and angle x. A corresponding pair such as q and x, or a vertically opposite pair, scores zero.*
- 9** Line PQ points the same way as line RS, and a third line crosses both of them. Line VW slopes differently and meets PQ. Which pair of lines is parallel? [1]
- ANSWER PQ // RS**
- 10** A rope is cut into 3 pieces. The longest is half of the whole rope and the shortest is one tenth of the whole rope. The piece left over is four fifths of a metre long. How long is the whole rope? [1]
- The leftover piece is $1 - \frac{1}{2} - \frac{1}{10} = \frac{2}{5}$ of the rope.
 - $\frac{2}{5}$ of the rope = $\frac{4}{5}$ m, so the rope is $\frac{4}{5} \times \frac{5}{2} = 2$ m.
- ANSWER 2 m**
- 11** A bar graph of goals in a tournament shows 9 goals in the first 30 minutes, 24 goals between the 31st and 60th minutes, and 7 goals after the 90th minute. The bar for the 61st to 90th minute has not been drawn. 62 goals were scored altogether. How tall should that bar be? [1]
- $9 + 24 + 7 = 40$ goals are already shown.
 - $62 - 40 = 22$ goals between the 61st and 90th minutes.
- ANSWER 22 goals**

- 12 These numbers fall by 2 at each step, reading across the rows. In which column does 26 appear? [1]

A	B	C	D
86	84	82	80
78	76	74	72
70	68	66	64
62	60	...	...

- 86 starts in column A and the columns then repeat A, B, C, D.
- $(86 - 26) \div 2 = 30$ steps on, and 30 is a multiple of 4, so 26 lands back in column A.

ANSWER **Column A**

- 13 A rectangle measures 20 cm by 14 cm. A square of side 4 cm is cut out at each of two corners. Find the perimeter of what remains. [1]

- The original perimeter is $2 \times (20 + 14) = 68$ cm.
- Each notch replaces one 4 cm edge with two new 4 cm edges, so each notch adds 4 cm.
- Two notches add 8 cm. The perimeter is $68 + 8 = 76$ cm.

ANSWER **76 cm**

- 14 Two squares overlap in a square of side 2 cm. The larger square has sides of 6 cm and the smaller has sides of 5 cm. The shaded part is everything that lies in exactly one of the two squares. Find the shaded area, then state the side of the smaller square. [1]

- Larger square = $6 \times 6 = 36 \text{ cm}^2$. Smaller square = $5 \times 5 = 25 \text{ cm}^2$. Overlap = $2 \times 2 = 4 \text{ cm}^2$.
- Shaded = $36 + 25 - 2 \times 4 = 53 \text{ cm}^2$.
- The smaller square has sides of 5 cm.

ANSWER **5 cm**

The shaded area is 53 cm^2 . Award the mark for the side, 5 cm.

- 15 Priya stands at a point and faces south-east. She makes a quarter turn anti-clockwise. Which direction is she facing now? [1]

- A quarter turn anti-clockwise from south-east passes through east and ends at north-east.

ANSWER **north-east**

Section B

30 marks

Questions 16 to 30 carry 2 marks each. Show your working. Marks are given for a correct method.

16 What is the 10th common multiple of 8 and 12? [2]

1. The lowest common multiple of 8 and 12 is 24.
2. The 10th common multiple is $10 \times 24 = 240$.

ANSWER **240**

17 Complete the pattern: 9, 8.992, 8.984, _____, 8.968, 8.960, _____. [2]

1. Each term falls by 0.008.
2. $8.984 - 0.008 = 8.976$ and $8.960 - 0.008 = 8.952$.

ANSWER **8.976 and 8.952**

18 Arrange in ascending order: $\frac{2}{5}$, 0.42, 0.405, $\frac{3}{8}$. [2]

1. $\frac{2}{5} = 0.400$ and $\frac{3}{8} = 0.375$.
2. $0.375 < 0.400 < 0.405 < 0.420$.

ANSWER **$\frac{3}{8}$, $\frac{2}{5}$, 0.405, 0.42**

19 Two parallel lines are cut by a transversal. The angle between the transversal and the upper line, on the right of the transversal and above the line, is 115° . Find the angle between the transversal and the lower line, on the left of the transversal and above that line. [2]

1. The given 115° angle and the angle directly below it on the upper line form a straight line, so that angle is $180^\circ - 115^\circ = 65^\circ$.
2. This 65° angle corresponds to the angle asked for on the lower line, because the lines are parallel.
3. The angle is 65° .

ANSWER **65°**

Accept a corresponding-angle argument or an alternate-angle argument that reaches 65° .

- 20 The dotted line down the middle is a line of symmetry. Write S in the two empty squares that must be shaded to complete the pattern. [2]

1	2	:	3	4
shaded		:		S
	shaded	:	S	
		:		
shaded		:		shaded

- The mirror sits between columns 2 and 3, so column 1 reflects onto column 4 and column 2 onto column 3.
- Row 1 column 1 is shaded, so row 1 column 4 must be shaded too. Row 2 column 2 is shaded, so row 2 column 3 must be shaded too.
- Row 4 is already symmetrical.

ANSWER **Row 1 column 4 and row 2 column 3.**

Award 1 mark for each square.

- 21 Every month, Hana saves half of her salary and spends half of what remains on food. She spends \$650 on food each month. How much does she save in 12 months? [2]

- Food is half of the half she does not save, so food is a quarter of her salary.
- Salary = $4 \times \$650 = \2600 , so she saves half of that, \$1300, each month.
- In 12 months she saves $12 \times \$1300 = \$15\,600$.

ANSWER **\$15 600**

- 22 This year, Mrs Tan is 4 times as old as her daughter. In 20 years, she will be twice as old as her daughter. How old is her daughter this year? [2]



- Let the daughter be 1 unit. Mrs Tan is 4 units.
- In 20 years: $4 \text{ units} + 20 = 2 \times (1 \text{ unit} + 20)$.
- $4 \text{ units} + 20 = 2 \text{ units} + 40$, so $2 \text{ units} = 20$ and $1 \text{ unit} = 10$.
- Her daughter is 10. Check: $40 + 20 = 60$ and $10 + 20 = 30$, and 60 is twice 30.

ANSWER **10 years old**

- 23** Rectangle ABCD is split into four smaller rectangles P, Q, R and S by one horizontal and one vertical line. P is top left, Q top right, R bottom right and S bottom left. The area of P is 24 cm^2 , of Q is 27 cm^2 and of R is 54 cm^2 . P and Q have the same height, and Q and R have the same width. Find the area of S. [2]

1. P and Q share their height, so their widths are in the ratio of their areas: $24 : 27 = 8 : 9$.
2. Q and R share their width, so their heights are in the ratio $27 : 54 = 1 : 2$.
3. S has the width of P and the height of R, so its area is $24 \times 2 = 48 \text{ cm}^2$.

ANSWER **48 cm^2**

- 24** On a quiz show, Devi wins \$10 for each question she gets right. She gets 4 questions right for every 7 she is asked. She won \$200. How many questions was she asked? [2]

1. She answered $\$200 \div \$10 = 20$ questions correctly.
2. 20 correct answers make $20 \div 4 = 5$ groups of questions.
3. She was asked $5 \times 7 = 35$ questions.

ANSWER **35 questions**

- 25** A stall sells 3 caps and 2 shirts for \$100. One cap and one shirt cost \$43 together. How much is one shirt? [2]

1. $3 \text{ caps} + 2 \text{ shirts} = \100 , and $1 \text{ cap} + 1 \text{ shirt} = \43 .
2. Three of the second deal give $3 \text{ caps} + 3 \text{ shirts} = \129 .
3. Subtract the first deal: $1 \text{ shirt} = \$129 - \$100 = \$29$.

ANSWER **\$29**

- 26** I am a number between 30 and 80. I have an odd number of factors, and none of my factors is even. What number am I? [2]

1. Only a square number has an odd number of factors. The squares between 30 and 80 are 36, 49 and 64.
2. 36 and 64 are even, so they have 2 as a factor.
3. $49 = 7 \times 7$. Its factors are 1, 7 and 49, all odd.

ANSWER **49**

- 27** In a group of 24 pupils, $\frac{2}{3}$ were boys. The same number of boys as girls then joined. [2]
After that, $\frac{3}{5}$ of the group were boys. How many girls joined?

1. At first there were $\frac{2}{3} \times 24 = 16$ boys and 8 girls.
2. Let k girls and k boys join. Then $(16 + k) \div (24 + 2k) = \frac{3}{5}$.
3. $5(16 + k) = 3(24 + 2k)$, so $80 + 5k = 72 + 6k$ and $k = 8$.
4. Check: 24 boys out of 40 pupils is $\frac{3}{5}$.

ANSWER **8 girls**

- 28** The average of 3 different odd numbers is 25. What is the largest any one of them can be? [2]

1. The three numbers add up to $3 \times 25 = 75$.
2. To make one as large as possible, make the other two as small as possible: 1 and 3.
3. The largest is $75 - 1 - 3 = 71$, which is odd and different from the others.

ANSWER **71**

- 29** A bar graph shows how many pets the children in a class have. 9 children have no pets, 6 have one, 3 have two, 4 have three and 2 have four. How many pets do the children have altogether? [2]

1. Pets = $(6 \times 1) + (3 \times 2) + (4 \times 3) + (2 \times 4)$.
2. = $6 + 6 + 12 + 8 = 32$.
3. The 9 children with no pets add nothing.

ANSWER **32 pets**

- 30** A tessellation is built from one tile: a triangle joined to a square along one full side. [2]
The tile is repeated by turning it, with no gaps and no overlaps. State the two shapes the tile is made from, and say how many tiles meet at each corner of the square.

ANSWER

A triangle and a square. Four tiles meet at each corner, because four right angles make a full turn.

Award 1 mark for naming both shapes and 1 mark for four tiles meeting at the square's corner. This replaces a drawing item, which the template cannot mark.

Marking notes

- Section A: 1 mark for the correct answer. A missing unit is not penalised where the unit is printed on the answer line.
- Section B: 1 mark for a correct method, 1 mark for the correct answer. A correct answer with no working scores 1 mark.

END OF PAPER