Ratio (Level 6-9)

Please write clearly in block capitals

Forename:
Surname:

Materials

For this paper you must have:
- mathematical instruments

You *can* use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.

1(a)   Jason, Damien and Julia save their money in a ratio of 2:5:8   *(Level 6)*

If Damien saves £45 a week, how much do they save in total?

[1 mark]

£18   £72   £90   £135

1(b)   There are 37 horses in a field.

Alannah, David and Taylor are supposed to share the horses with a ratio of 4:2:1, with no part horses allowed.

What is the least number of horses that must be removed to allow this ratio to work with full numbers?

[1 mark]

1   2   3   4

1(c)   The ratio used to share some money between two people is 3:5 One person gets £16 less than another.

Express the amount each receives as a ratio.

[1 mark]

$5:21$ $19:35$ $24:40$ $48:64$

Turn over for next questions

Turn over ▶

2 The ratio of apples, a, to oranges, o, is $11 : 17$ *(Level 6)*

Express this ratio as an equation in terms of a.

[2 marks]

_____

_____

_____

_____

Answer _____

3 Given that,   *(Level 7)*

$$x + 1 : 3y = 1 : 7, \quad and \quad 2x : y + 3 = 2 : 5$$

Find x and y

[4 marks]

_____

_____

_____

_____

_____

_____

Answer _____

6

Turn over ▶

4   A bag contains a mixture of 160 5p and 10p coins.   *(Level 7)*

        The ratio of 5p to 10p coins is $7:3$

        Some 10p coins are added so that now the ratio of 5p to 10p coins is $7:5$

4(a)   How many 10p coins were added?

[3 marks]

Answer _____

4(b)   What is the value of the coins before and after the additional 10p coins were added?

[2 marks]

Answer _____

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5

Turn over ▶

5   In order to make a new colour, an artist combines 4 parts blue, 3 parts yellow and 7   *(Level 7)*
         parts red.

5(a)   If the combination results in a quantity of 210 ml of paint, how much of each colour is
          used?

                                                                                    [3 marks]

_____

_____

_____

_____

          Answer   _____

5(b)   The cost of blue paint is 6p per ml, yellow paint is 4p per ml and red paint is 2p per
          ml.

          The mixture allows for 5 paintings to be created with only this colour.

          Each painting sells for £5.

          How much profit does the artist make?

                                                                                    [3 marks]

_____

_____

_____

_____

          Answer   _____

Turn over for next question

6

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6 A survey is taken of students' pets. *(Level 7)*

The results are expressed in the following ratios:

the number of cats to dogs is 3 : 2

the number of cats to birds is 4 : 1

6(a) If there were 207 animals recorded, how many birds were recorded?

[3 marks]

_____

_____

_____

_____

Answer _____

6(b) Find how many dogs were recorded.

[1 mark]

_____

_____

Answer _____

7 At a children's birthday party each child was given a party bag that was red, blue or green. *(Level 7)*

The ratio of red to blue party bags was 4 : 3

The ratio of blue to green was 3 : 2

Find the ratio of those who received a red party bag to those who received a green party bag.

[2 marks]

_____

_____

_____

_____

Answer _____

4

Turn over ►

8   A box contains a selection of red, blue and orange sweets in the ratio $4:3:6$ *(Level 8)*

6 blue sweets are added to the box making the probability of selecting a blue sweet $\frac{1}{3}$

8(a)   What is the new total number of sweets in the box?

[3 marks]

Answer _____

8(b)   Hence what is the probability of randomly selecting an orange sweet?

[1 mark]

Answer _____

4

Turn over ►

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9   A business has two different offices, one in London, the other in New York.   *(Level 9)*

The ratio of the number of staff at the London office to New York office is 3 : 5

Employees of the business are either part time or full time.

In London 30% of the staff are part time

In New York 20% of the staff are part time

Given that the business has 38 part-time members of staff, work out the total number of employees.

[3 marks]

Answer _____

End of Questions

5