

## Ratio (Higher)

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  
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

- 2 The ratio of apples,  $a$ , to oranges,  $o$ , is  $11 : 17$   
Express this ratio as an equation with  $a$  as the subject.

[2 marks]

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Answer \_\_\_\_\_

- 3 Given that,

$$x + 1 : 3y = 1 : 7, \text{ and } 2x : y + 3 = 2 : 5$$

Find  $x$  and  $y$

[4 marks]

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Answer \_\_\_\_\_



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Turn over ►

- 4** A bag contains a mixture of 160 5p and 10p coins.  
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]**

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Answer \_\_\_\_\_

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

**[2 marks]**

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Answer \_\_\_\_\_

5

In order to make a new colour, an artist combines 4 parts blue, 3 parts yellow and 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]

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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]

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Answer \_\_\_\_\_

Turn over for next question

**6** A survey is taken of students' pets.

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]**

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Answer \_\_\_\_\_

**6(b)** Find how many dogs were recorded.

**[1 mark]**

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Answer \_\_\_\_\_

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

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]**

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Answer \_\_\_\_\_

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

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]**

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Answer \_\_\_\_\_

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

**[1 mark]**

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Answer \_\_\_\_\_



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9

A business has two different offices, one in London, the other in New York.

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]**

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Answer \_\_\_\_\_

**End of Questions**