

# Edexcel GCSE

## Mathematics (Linear) – 1MA0

# RATIO

**Materials required for examination**

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.

Tracing paper may be used.

**Items included with question papers**

Nil

**Instructions**

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Use black ink or ball-point pen.

Fill in the boxes at the top of this page with your name, centre number and candidate number.

Answer all questions.

Answer the questions in the spaces provided – there may be more space than you need.

Calculators may be used.

**Information**

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The marks for each question are shown in brackets – use this as a guide as to how much time to spend on **each** question.

Questions labelled with an **asterisk (\*)** are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

**Advice**

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Read each question carefully before you start to answer it.

Keep an eye on the time.

Try to answer every question.

Check your answers if you have time at the end.

1. A piece of wood is of length 45 cm.  
The length is divided in the ratio 7 : 2

Work out the length of each part.

$$7 + 2 = 9$$

$$45 \div 9 = 5$$

$$7 \times 5 = 35$$

$$2 \times 5 = 10$$

..... 35 ..... 10 ..... cm, ..... cm

(3 marks)

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2. Alex and Ben were given a total of £240  
They shared the money in the ratio 5 : 7

Work out how much money Ben received.

Alex : Ben

5 : 7

Ben has 7 shares

$$5 + 7 = 12$$

$$£240 \div 12 = £20$$

$$£20 \times 7 = £140$$

£ 140 .....

(3 marks)

3. Ken and Susan share £20 in the ratio 1 : 3  
Work out how much money each person gets.

Ken : Susan  
1 : 3

$$1 + 3 = 4$$

$$£ 20 \div 4 = £ 5$$

$$1 \times £ 5 = £ 5 \quad 3 \times £ 5 = £ 15$$

Ken £ 5 .....

Susan £ 15 .....

(3 marks)

4. Melissa is 13 years old.  
Becky is 12 years old.  
Daniel is 10 years old.

Melissa, Becky and Daniel share £28 in the ratio of their ages.  
Becky gives a third of her share to her mother.

How much should Becky now have?

Melissa : Becky : Daniel

13 : 12 : 10

Becky gets 12 shares

Becky gives  $\frac{1}{3}$  to her mother

$$\frac{1}{3} \text{ of } £ 9.60 = £ 3.20$$

Becky has £ 6.40 left

$$13 + 12 + 10 = 35$$

$$£ 28 \div 35 = £ 0.80$$

$$\text{Becky gets } 12 \times £ 0.80 = £ 9.60$$

£ 6.40 .....

(Total 4 marks)

5. Amy, Beth and Colin share 36 sweets in the ratio 2 : 3 : 4

Work out the number of sweets that each of them receives.

Amy : Beth : Colin

2 : 3 : 4

$$2 + 3 + 4 = 9$$

$$36 \div 9 = 4$$

$$2 \times 4 = 8 \quad 3 \times 4 = 12 \quad 4 \times 4 = 16$$

Amy.....<sup>8</sup>sweets

Beth.....<sup>12</sup>sweets

Colin.....<sup>16</sup>sweets

(3 marks)

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6. A shop sells CDs and DVDs.

In one week the number of CDs sold and the number of DVDs sold were in the ratio 3:5  
The total number of CDs and DVDs sold in the week was 728

Work out the number of CDs sold.

CD : DVD

3 : 5

$$3 + 5 = 8$$

$$728 \div 8 = 91$$

$$3 \times 91 = 273$$

.....<sup>273</sup> CDs

(3 marks)

girls : Boys  
2 : 3  
□□ : □□□

7. The ratio of girls to boys in a school is 2 : 3

(a) What fraction of these students are boys?

$$\frac{3}{5}$$

(2)

In Year 8 the ratio of girls to boys is 1 : 3

There are 300 students in Year 8.

(b) Work out the number of girls in Year 8.

girls : boys  
1 : 3

$$1 + 3 = 4$$

$$300 \div 4 = 75$$

$$1 \times 75 = 75$$

75 girls

(3)

(5 marks)

8. Ann and Bob shared £240 in the ratio 3 : 5

Ann gave a **half** of her share to Colin.

Bob gave a **tenth** of his share to Colin.

What fraction of the £240 did Colin receive?

Anna : Bob  
3 : 5

$$3 \times 30 = £90$$

$$5 \times £30 = £150$$

$$3 + 5 = 8$$

$$£240 \div 8 = £30$$

Anna gives half to Colin.  $\frac{1}{2}$  of £90 = £45

Bob gives  $\frac{1}{10}$  to Colin  $\frac{1}{10}$  of £240 = £24

Colin gets £45 + £24 = £69

Fraction is  $\frac{69}{240} = \frac{23}{80}$

$$\frac{23}{80}$$

(5 marks)

9. Peter won £75 as a prize.

He gave  $\frac{4}{5}$  of the prize money as a present to Roger and Bethan.

Roger and Bethan shared the present in the ratio 2:3

Work out how much they each got.

$$\frac{4}{5} \text{ of } £75 = £60$$

Roger : Bethan

2 : 3

$$2 + 3 = 5$$

$$£60 \div 5 = £12$$

$$2 \times £12 = £24$$

$$3 \times £12 = £36$$

Roger £24

Bethan £36

(4 marks)

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10. Rosa prepares the ingredients for pizzas.



She uses cheese, topping and dough in the ratio 2 : 3 : 5

Rosa uses 70 grams of dough.

Work out the number of grams of cheese and the number of grams of topping Rosa uses.

cheese : topping : dough

2 : 3 : 5

: 70g

$$5 \text{ shares} = 70\text{g}$$

$$\text{so 1 share} = 70\text{g} \div 5 = 14\text{g}$$

$$\text{cheese} = 2 \times 14\text{g} = 28\text{g}$$

$$\text{topping} = 3 \times 14\text{g} = 42\text{g}$$

Cheese ..... 28 ..... g

Topping ..... 42 ..... g

(Total 3 marks)

11. 5 schools sent some students to a conference.

One of the schools sent both boys and girls.

This school sent 16 boys.

The ratio of the number of boys it sent to the number of girls it sent was 1 : 2

The other 4 schools sent only girls.

Each of the 5 schools sent the same number of students.

Work out the total number of students sent to the conference by these 5 schools.

School 1  
Boys : Girls  
1 : 2  
16

All schools send the same  
number of students

so  $5 \times 48 = 240$  students altogether

1 share = 16

2 shares = 32

it sent 32 girls

Altogether it sent 48 students.

240 students

(4 marks)

12. Pat and Julie share some money in the ratio 2 : 5

Julie gets £45 more than Pat.

How much money did Pat get?

Pat : Julie

2 : 5

□ □

□ □ □ □ □

Julie gets 3 extra shares.

She gets £45 more.

£45 = 3 shares

1 share =  $£45 \div 3 = £15$ .

£30

(4 marks)

Pat gets  $2 \times £15 = £30$

rest of her take home pay is 60  
 60% of £15 000 = £9000

13. Last year Kerry's take home pay was £15 000  
 She spent 40% of her take home pay on rent.

She used the rest of her take home pay for living expenses, clothes and entertainment in the ratio 3 : 1 : 2

How much did Kerry spend on entertainment last year?

living expenses : clothes : entertainment  
 3 : 1 : 2

$$3 + 1 + 2 = 6$$

$$£9000 \div 6 = £1500$$

$$\text{entertainment} = 2 \times £1500$$

£3000  
 (4 marks)

- \*14. Talil is going to make some concrete mix.  
 He needs to mix cement, sand and gravel in the ratio 1 : 3 : 5 by weight.

$$1 + 3 + 5 = 9$$

$$180 \text{ kg} \div 9 = 20 \text{ kg}$$

Talil wants to make 180 kg of concrete mix.

Talil needs

Talil has

15 kg of cement

85 kg of sand

100 kg of gravel

cement	:	sand	:	gravel
1		3		5
$1 \times 20$		$3 \times 20$		$5 \times 20$
20kg		60kg		100kg

Does Talil have enough cement, sand and gravel to make the concrete mix?

Talil has enough cement

He does not have enough sand. He needs 25kg more

He has the right amount of gravel.

(4 marks)

15. Jim has only 5p coins and 10p coins.

The ratio of the number of 5p coins to the number of 10p coins is 2 : 3

5p : 10p

2 : 3

Work out the ratio of

the total value of the 5p coins : the total value of the 10p coins.

$$2 \times 5p = 10p$$

Give your answer in its simplest form.

$$3 \times 10p = 30p$$

value of the 5p coins : value of 10p coins

10 : 30

1 : 3

(4 marks)