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GCSE MATHS

Number

Edexcel 1MA1 | Subtopic collection Topic 03

Fractions and mixed numbers

Higher tier

Past paper question booklet

48	2007-2025	Higher
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

18. Prove that the recurring decimal $0.\dot{4}\dot{5} = \frac{15}{33}$

blank

Q18

(Total 3 marks)

1. (a) Work out $2\frac{3}{4}+3\frac{2}{3}$

Give your answer as a fraction in its simplest form.

.....

(3)

(b) (i) Which of these fractions can be written as a recurring decimal?

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$

.....

(ii) Explain your answer.

.....

.....

.....

(2) **Q1**

(Total 5 marks)

23. Prove that the recurring decimal $0.\dot{3}\dot{6} = \frac{4}{11}$

Q23

(Total 3 marks)

2. (a) Use your calculator to work out the value of $\frac{8.7 \times 12.3}{9.5 - 5.73}$

Write down all the digits from your calculator.
Give your answer as a decimal.

.....

(2)

(b) Write your answer to part (a) correct to 1 significant figure.

.....

(1)

Q2

(Total 3 marks)

6. (a) Use your calculator to work out $\frac{2}{1.5+2.45}$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(2)

(b) Write your answer to part (a) correct to 2 decimal places.

.....

(1)

Q6

(Total 3 marks)

Blank

9. Use your calculator to work out

$$\frac{13.7 + 5.86}{2.54 \times 3.17}$$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

Q9

(Total 2 marks)

blank

16. (a) Work out $\frac{2}{3} \div \frac{5}{6}$

Give your fraction in its simplest form.

.....

(3)

(b) Work out $2\frac{1}{3} - 1\frac{2}{5}$

.....

(3)

Q16

(Total 6 marks)

13. Use your calculator to work out

$$\sqrt{\frac{920 - 170\tan 65°}{0.012 + 0.034}}$$

(a) Write down all the figures on your calculator display.
You must write your answer as a decimal.

.....

(2)

(b) Give your answer to part (a) correct to 3 significant figures.

.....

(1)

Q13

(Total 3 marks)

Question 09

14 Express $0.2\dot{5}$ as a fraction in its simplest form.

.....

(Total for Question 14 is 3 marks)

24 Express the recurring decimal $0.2\dot{8}\dot{1}$ as a fraction in its simplest form.

.....

(Total for Question 24 is 3 marks)

2 (a) Use your calculator to work out $\dfrac{38.5 \times 14.2}{18.4 - 5.9}$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(2)

(b) Write your answer to part (a) correct to 1 significant figure.

.....

(1)

(Total for Question 2 is 3 marks)

Question 12

1 Use a calculator to work out

$$\frac{\sqrt{20.4}}{6.2 \times 0.48}$$

Write down all the figures on your calculator display.
Give your answer as a decimal.

.....

(Total for Question 1 is 2 marks)

17 Calculate the value of $\sqrt{\dfrac{\tan 60° + 1}{\tan 60° - 1}}$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(Total for Question 17 is 2 marks)

15 Express the recurring decimal $0.7\dot{5}\dot{0}$ as a fraction.

.....

(Total for Question 15 is 3 marks)

Question 15

3 Use your calculator to work out $\dfrac{\sqrt{40.96}}{7.1 - 2.48}$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(Total for Question 3 is 2 marks)

1 (a) Use your calculator to work out $\dfrac{\sqrt{7056}}{0.35 \times 12.8}$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(2)

(b) Write your answer to part (a) correct to 1 significant figure.

.....

(1)

(Total for Question 1 is 3 marks)

2 One day a supermarket has 8420 customers.

65% of the customers pay with a debit card.

$\frac{1}{5}$ of the customers pay with a credit card.

The rest of the customers pay with cash.

Work out how many customers pay with cash.

.....

(Total for Question 2 is 4 marks)

2 One day a supermarket has 8420 customers.

65% of the customers pay with a debit card.

$\frac{1}{5}$ of the customers pay with a credit card.

The rest of the customers pay with cash.

Work out how many customers pay with cash.

.....

(Total for Question 2 is 4 marks)

Question 19

15 Express the recurring decimal $0.1\dot{5}$ as a fraction.
Give your answer in its simplest form.

.....

(Total for Question 15 is 3 marks)

8 Work out $3\frac{1}{3} \times 4\frac{2}{5}$

Give your answer as a mixed number in its simplest form.

.....

(Total for Question 8 is 3 marks)

23 The diagram shows a container for grain.

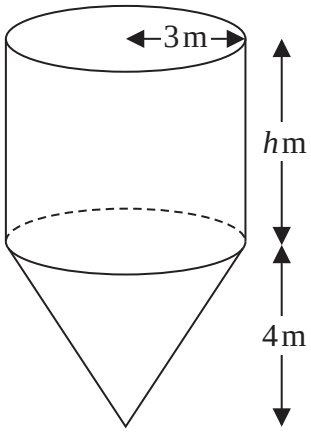


Diagram **NOT** accurately drawn

The container is a cylinder on top of a cone.
The cylinder has a radius of 3m and a height of hm.
The cone has a base radius of 3m and a vertical height of 4m.

The container is empty.
The container is then filled with grain at a constant rate.

After 5 hours the depth of the grain is 6 metres above the vertex of the cone.
After 9 hours the container is full of grain.

Work out the value of h.
Give your answer as a fraction in its simplest form.
You must show all your working.

.....

(Total for Question 23 is 5 marks)

3 Use your calculator to work out $\dfrac{\sqrt{70.25}}{4.2 - 2.37}$

(a) Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(2)

(b) Write your answer to part (a) correct to 4 decimal places.

.....

(1)

(Total for Question 3 is 3 marks)

10 Work out $3\frac{4}{5} + \frac{3}{7}$

Give your answer as a mixed number in its simplest form.

.....

(Total for Question 10 is 3 marks)

18 (a) Work out $1\frac{1}{5} \times 2\frac{1}{3}$

Give your answer as a mixed number in its simplest form.

.....

(3)

(b) Work out $2\frac{7}{15} - 1\frac{2}{3}$

.....

(3)

(Total for Question 18 is 6 marks)

13 Work out $8\frac{1}{3} \times 1\frac{2}{5}$

Give your answer as a mixed number in its simplest form.

.....

(Total for Question 13 is 3 marks)

Question 26

16 $\frac{\sqrt{3}}{5} + \frac{2}{\sqrt{3}} = a\sqrt{3}$, where a is a fraction.

Find the value of a.

.....

(Total for Question 16 is 3 marks)

5 Use your calculator to work out $\dfrac{1.45^2}{3.89 - \sqrt{5.75}}$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(Total for Question 5 is 2 marks)

Question 28

20 Prove algebraically that the recurring decimal $0.1\dot{7}\dot{8}$ can be written as the fraction $\frac{59}{330}$

(Total for Question 20 is 3 marks)

Question 29

June 2017 | 1MA1/1H | Original Q14

14 White shapes and black shapes are used in a game.
Some of the shapes are circles.
All the other shapes are squares.

The ratio of the number of white shapes to the number of black shapes is 3 : 7

The ratio of the number of white circles to the number of white squares is 4 : 5

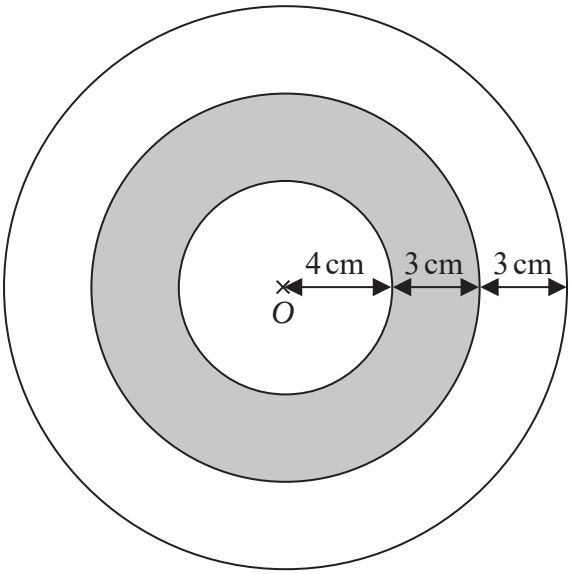
The ratio of the number of black circles to the number of black squares is 2 : 5

Work out what fraction of all the shapes are circles.

.....

(Total for Question 14 is 4 marks)

4 The diagram shows a logo made from three circles.



Each circle has centre O.

Daisy says that exactly $\frac{1}{3}$ of the logo is shaded.

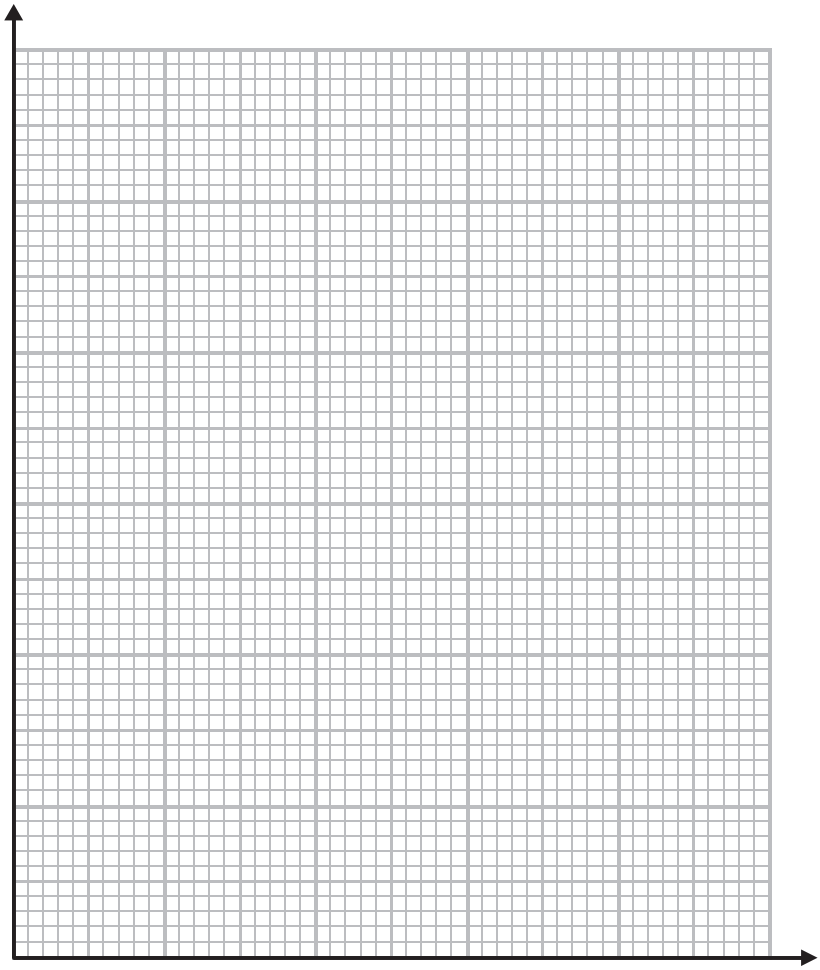
Is Daisy correct?
You must show all your working.

(Total for Question 4 is 4 marks)

17 The table gives information about the heights of 150 students.

Height (h cm)	Frequency
$140 < h \leqslant 150$	15
$150 < h \leqslant 155$	30
$155 < h \leqslant 160$	51
$160 < h \leqslant 165$	36
$165 < h \leqslant 180$	18

(a) On the grid, draw a histogram for this information.



(3)

(b) Work out an estimate for the fraction of the students who have a height between 150 cm and 170 cm.

.....

(2)

(Total for Question 17 is 5 marks)

5 (a) Find the value of the reciprocal of 1.6
Give your answer as a decimal.

.....

(1)

Jess rounds a number, x, to one decimal place.
The result is 9.8

(b) Write down the error interval for x.

.....

(2)

(Total for Question 5 is 3 marks)

1 (a) Work out $2\frac{1}{7} + 1\frac{1}{4}$

.....

(2)

(b) Work out $1\frac{1}{5} \div \frac{3}{4}$

Give your answer as a mixed number in its simplest form.

.....

(2)

(Total for Question 1 is 4 marks)

Question 34

9 Work out $3\frac{1}{2} \times 1\frac{3}{5}$

Give your answer as a mixed number in its simplest form.

.....

(Total for Question 9 is 3 marks)

Question 35

3 Work out $1\frac{3}{4} \times 1\frac{1}{3}$

Give your answer as a mixed number.

.....

(Total for Question 3 is 3 marks)

Question 36

15 Express $0.4\dot{1}\dot{8}$ as a fraction.
You must show all your working.

.....

(Total for Question 15 is 3 marks)

14 A group of people went to a restaurant.
Each person chose one starter and one main course.

starter	main course
soup	lasagne
prawns	curry

the number of people who chose soup : the number of people who chose prawns = 2 : 3

Of those who chose soup,
the number of people who chose lasagne : the number of people who chose curry = 5 : 3

Of those who chose prawns,
the number of people who chose lasagne : the number of people who chose curry = 1 : 5

What fraction of the people chose curry?
You must show how you get your answer.

.....

(Total for Question 14 is 4 marks)

Question 38

2 Show that $2\frac{1}{3} \times 3\frac{3}{4} = 8\frac{3}{4}$

(Total for Question 2 is 3 marks)

23 There are four types of cards in a game.

Each card has a black circle or a white circle or a black triangle or a white triangle.



number of cards with a black shape : number of cards with a white shape = 3 : 5

number of cards with a circle : number of cards with a triangle = 2 : 7

Express the total number of cards with a black shape as a fraction of the total number of cards with a triangle.

.....

(Total for Question 23 is 3 marks)

Question 40

3 Work out $4\frac{1}{5} - 2\frac{2}{3}$

Give your answer as a mixed number.

.....

(Total for Question 3 is 3 marks)

13 Ted is trying to change $0.\dot{4}\dot{3}$ to a fraction.

Here is the start of his method.

$$x = 0.\dot{4}\dot{3}$$

$$10x = 4.\dot{3}\dot{4}$$

$$10x - x = 4.\dot{3}\dot{4} - 0.\dot{4}\dot{3}$$

Evaluate Ted's method so far.

.....

.....

.....

(Total for Question 13 is 1 mark)

12 Express $0.1\dot{1}\dot{7}$ as a fraction.
You must show all your working.

.....

(Total for Question 12 is 3 marks)

2 (a) Work out $1\frac{3}{5} + 2\frac{1}{4}$

Give your answer as a mixed number.

.....

(2)

(b) Show that $2\frac{2}{3} \div 6 = \frac{4}{9}$

(2)

(Total for Question 2 is 4 marks)

6 Rizwan writes down three numbers a, b and c

$$a : b = 1 : 3$$
$$b : c = 6 : 5$$

(a) (i) Find $a : b : c$

.....

(2)

(ii) Express a as a fraction of the total of the three numbers a, b and c

.....

(2)

Emma writes down three numbers m, n and p

$$n = 2m$$
$$p = 5n$$

(b) Find $m : p$

.....

(2)

(Total for Question 6 is 6 marks)

Question 45

2 Work out $7\frac{3}{8} - 2\frac{1}{2}$

Give your answer as a mixed number.

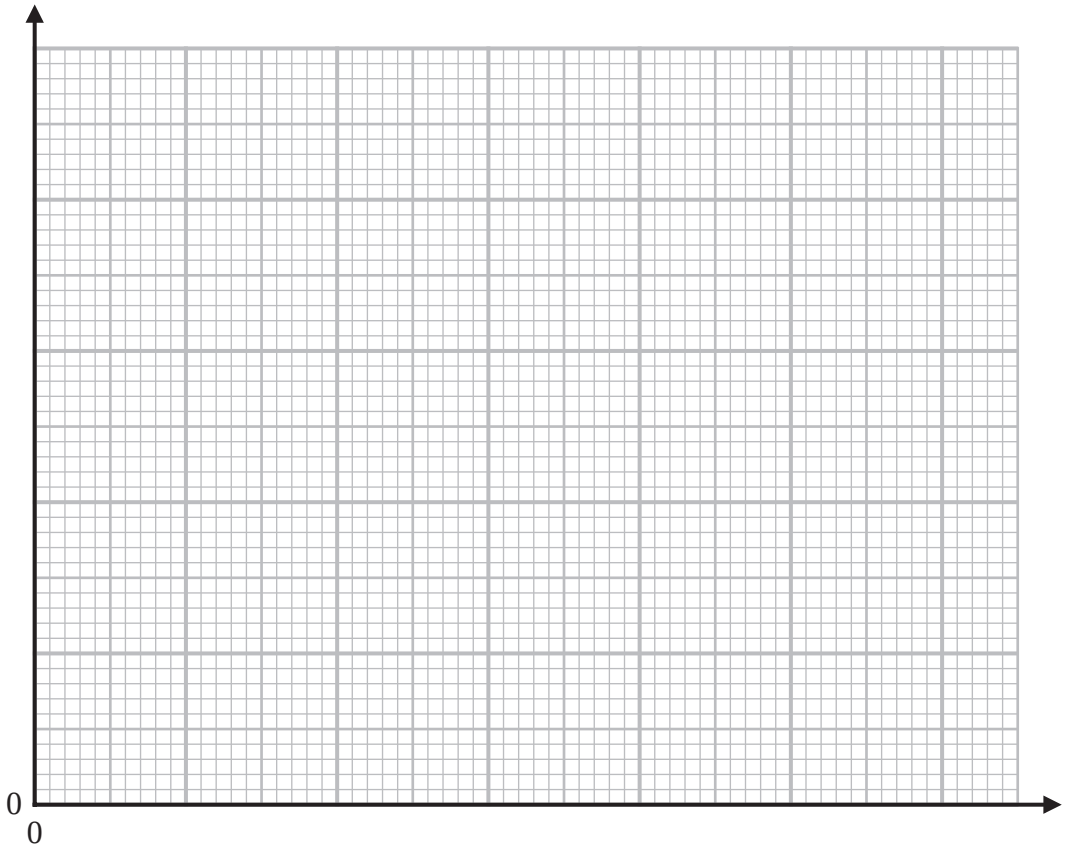
.....

(Total for Question 2 is 3 marks)

13 The table gives information about the amount of time that each of 150 people were in a shop.

Time (t minutes)	Frequency
$0 < t \leqslant 10$	20
$10 < t \leqslant 30$	70
$30 < t \leqslant 35$	22
$35 < t \leqslant 50$	30
$50 < t \leqslant 60$	8

(a) On the grid, draw a histogram for this information.



(3)

(b) Work out an estimate for the fraction of these 150 people who were in the shop for between 20 minutes and 40 minutes.

.....

(2)

(Total for Question 13 is 5 marks)

3 (a) Work out $3\frac{1}{2} - 1\frac{1}{6}$

Give your answer as a mixed number.

.....

(2)

(b) Show that $5\frac{1}{4} \div 2\frac{1}{3} = 2\frac{1}{4}$

(3)

(Total for Question 3 is 5 marks)

13 $x = 0.\dot{2}$ $y = 0.6\dot{8}\dot{1}$

Work out the value of xy.
Give your answer as a fraction in its simplest form.

.....

(Total for Question 13 is 5 marks)