Name ANSWERS	Class

MATHS TEACHER HUB

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Fractions of amounts

(9 – 1) Topic booklet

Foundation

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

Instructions

- 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.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

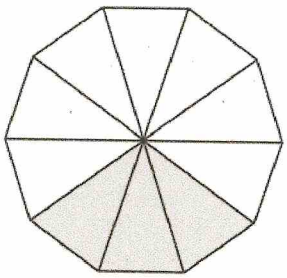
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- 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.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

2 What fraction of this shape is shaded?



$\frac{3}{10}$

June 2023 – Paper 1F

(Total for Question 2 is 1 mark)

2 Work out $\frac{1}{4}$ of 28

7

June 2022 – Paper 3F

(Total for Question 2 is 1 mark)

2 Work out $\frac{1}{3}$ of 24

8

May 2020 – Paper 3F

(Total for Question 2 is 1 mark)

2 Find $\frac{1}{3}$ of 30

10

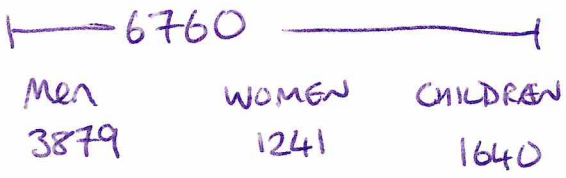
November 2019 – Paper 3F

(Total for Question 2 is 1 mark)

3 There are 6760 people at at a rugby match.
3879 of the people are men.
1241 of the people are women.

$\frac{1}{4}$ of the children are girls.

Work out how many boys are at the rugby match.



1230

Sample 1 – Paper 3F

(Total for Question 3 is 3 marks)

4 Work out $\frac{1}{6}$ of 66

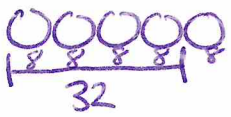
11

November 2021 – Paper 3F

(Total for Question 4 is 1 mark)

4 $\frac{4}{5}$ of a number is 32

Find the number.



40

June 2017 – Paper 3F

(Total for Question 4 is 2 marks)

4 Work out $\frac{1}{8}$ of 720

90

November 2018 – Paper 3F

(Total for Question 4 is 1 mark)

5 Work out $\frac{1}{5}$ of 300

60

November 2023 – Paper 1F

(Total for Question 5 is 1 mark)

5 A path is made of white tiles and grey tiles.

$\frac{1}{4}$ of the tiles are white.

(a) Write down the ratio of white tiles to grey tiles.

$\frac{1}{4} : \frac{3}{4}$

W : G

1 : 3

(1)

There is a total of 56 tiles.

(b) Work out the number of grey tiles.

$\frac{3}{4} \times 56$

42

(2)

June 2017 – Paper 3F

(Total for Question 5 is 3 marks)

5

Living to 100 years old

1 in 3 babies born last year
are expected to live
to 100 years old

720 000 babies were born last year.

How many of these babies are expected to live to 100 years old?

$\frac{1}{3} \times 720000$

240000

(Total for Question 5 is 2 marks)

6 Sue has 2 cats.

Each cat eats $\frac{1}{4}$ of a tin of cat food each day.

Sue buys 8 tins of cat food.

Has Sue bought enough cat food to feed her 2 cats for 14 days?
You must show how you get your answer.

1 cat = $\frac{1}{4}$ tin a day

2 cats = $\frac{1}{2}$ tin a day

8 tins = 16 days

Yes she has bought enough for 14 days

(Total for Question 6 is 3 marks)

6 There are 495 coins in a bottle.

$\frac{1}{3}$ of the coins are £1 coins.
124 of the coins are 50p coins.
The rest of the coins are 20p coins.

Work out the total value of the 495 coins.

165 £1
124 50p
206 20p

$\frac{1}{3}$ of 495 = £165

124 × 50p = £62

206 × 20p = £41.20

£ 268.20

(Total for Question 6 is 4 marks)

7 208 bars of chocolate were sold from a shop.

$\frac{1}{4}$ of these bars of chocolate were large bars.

The rest of the bars of chocolate were small bars.

All the large bars of chocolate were sold for £1 each.
All the small bars of chocolate were sold for 60p each.

Work out the total amount of money for which the 208 bars of chocolate were sold.
Give your answer in pounds.

large 52

small 156

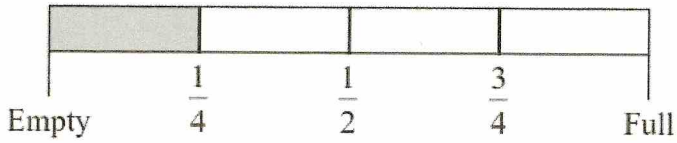
52 × £1 = £52

156 × 60p £93.60

£ 145.60

(Total for Question 7 is 3 marks)

8 Here is the gauge for the fuel tank of a car.



The fuel tank holds 52 litres of fuel when the tank is full.

The tank is $\frac{1}{4}$ full of fuel.

Work out how many more litres of fuel are needed to fill the tank.

$\frac{1}{4}$ of 52 = 13

13 × 3 =

39 litres

June 2019 – Paper 3F **(Total for Question 8 is 3 marks)**

10 Jim thinks of a number.

$\frac{2}{3}$ of Jim's number is 48

Work out $\frac{5}{6}$ of Jim's number.

24 24 24
48

Jims number = 72

$\frac{5}{6}$ of 72 = 60

60

November 2017 – Paper 3F **(Total for Question 10 is 2 marks)**

10 Jenny has 12 marbles.

$\frac{1}{4}$ of these 12 marbles are large.

The rest of these 12 marbles are small.

Each large marble has a weight of 70 grams.
Each small marble has a weight of 50 grams.

Work out the total weight of the 12 marbles.

large | Small
3 | 9
3 x 70g | 9 x 50g
210g | 450g

660 grams

May 2020 – Paper 1F

(Total for Question 10 is 4 marks)

10 Bill has 400 counters in a bag.

He gives
- 35 of the counters to Sameena
- 50 of the counters to Henry
- 75 of the counters to Lucas

What fraction of the 400 counters is left in Bill's bag?
Give your fraction in its simplest form.

$400 - 35 - 50 - 75 = 240$

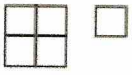
$\frac{240}{400} = \frac{24}{40} = \frac{12}{20} = \frac{6}{10}$

$\frac{3}{5}$

.....

(Total for Question 10 is 3 marks)

11 The pictogram shows information about the number of video games sold in a shop on Monday, on Tuesday and on Wednesday.

Monday	
Tuesday	 22
Wednesday	 6
Thursday	
Friday	

Key:
 represents 8 video games

(a) How many video games were sold on Monday?

16

(1)

More video games were sold on Tuesday than on Wednesday.

(b) How many more?

22 − 6 =

16

(2)

On Thursday and Friday, a total of 32 video games were sold in the shop.

$\frac{1}{4}$ of these 32 video games were sold in the shop on Thursday.

(c) Complete the pictogram for Thursday and Friday.

$\frac{1}{4}$ of 32 = 8

$\frac{3}{4}$ of 32 = 24

(3)

(Total for Question 11 is 6 marks)

11 Dylan buys 13 bicycle lights for £7.50 each.
He pays with five £20 notes.

(a) How much change should Dylan get?

$5 \times £20 = £100$

$13 \times 7.50 = £97.50$

£ 2.50

(3)

The normal price of a bicycle is £120

In a sale, there is $\frac{1}{5}$ off the normal price of the bicycle.

(b) Work out the price of the bicycle in the sale.

$\frac{1}{5}$ of $120 = 24$

$120 - 24$

£ 96

(2)

(Total for Question 11 is 5 marks)

12 Elena spent 120 minutes at a sports centre.

She played badminton for 50 minutes.

She used the swimming pool for $\frac{1}{6}$ of the 120 minutes.

She used the gym for 20% of the 120 minutes.
She then spent the rest of the 120 minutes in the cafe.

(a) Work out the total time, in minutes, that Elena spent in the cafe.

$\frac{1}{6}$ of 120 = 20 minutes swimming

20% of 120 = 24 minutes Gym

+ 50 minutes badminton

94 minutes

120 − 94

26 minutes

(4)

Elena got to the sports centre at 1.30 pm.
She had asked her friend to meet her in the cafe at 3 pm.

(b) Did Elena get to the cafe by 3 pm?
Give a reason for your answer.

94 minutes = 1 hour 34 minutes

1:30pm Arrive → 3:04pm

No she did not get there for 3pm

(1)

(Total for Question 12 is 5 marks)

12 Saira buys 24 bars of chocolate.

$\frac{2}{3}$ of the 24 bars are white chocolate.

The rest of the 24 bars are milk chocolate.

Each milk chocolate bar has a weight of 35 grams.

Work out the total weight of the milk chocolate bars that Saira buys.

$\frac{2}{3}$ of 24 = 16 white

8 milk (35g each)

280 grams

(Total for Question 12 is 3 marks)

12 Work out $\frac{5}{8}$ of 132

82.5

(2)

November 2022 – Paper2F

(Total for Question 12 is 2 marks)

12 There are two drama groups in a school.

In one group there are 36 boys and 48 girls.

In the other group, $\frac{3}{7}$ of the students are boys and the rest of the students are girls.

Ann says,

"The ratio of the number of boys to the number of girls is the same for both groups."

Is Ann correct?

You must show how you get your answer.

36 : 48

18 : 24

9 : 12

3 : 4

$\frac{3}{7} : \frac{4}{7}$

3 : 4

She is correct, they are both 3:4

November 2021 – Paper 1F

(Total for Question 12 is 3 marks)

13 There are 50 teachers in a school.

This is $\frac{1}{16}$ of the total number of people in the school.

Work out the total number of people in the school.

$\frac{1}{16} = 50$

$\frac{16}{16} = 800$

800

June 2023 – Paper 2F

(Total for Question 13 is 2 marks)

14 On Friday,

500 people watched a film at the cinema.
70% of these people were children.

350 children

On Saturday,

720 people watched the film at the cinema.
$\frac{5}{8}$ of these people were children.

450 children

Kasim thinks more children watched the film on Friday than on Saturday.

Is Kasim correct?
You must show how you get your answer.

Kasim is wrong,

450 children watched the film on Saturday compared to 350 on Friday.

(3)

June 2023 – Paper 1F

(Total for Question 14 is 3 marks)

14 A stadium cost £600 million.

$\frac{13}{15}$ of this cost was for the building.

The rest of the cost was for the land.

Work out the cost of the land.

600,000,000

$\frac{2}{15} \times 600,000,000 = 80,000,000$

£ 80 million

(Total for Question 14 is 3 marks)

14 (a) Work out $\frac{1}{5}$ of 70

14

(1)

Fiona has to work out the exact value of $48 \div \frac{1}{2}$

She writes

$$48 \div \frac{1}{2} = 24$$

Fiona's reason is,

"There are 2 halves in 1, so there will be 24 halves in 48"

(b) Explain what is wrong with Fiona's reason.

Dividing by $\frac{1}{2}$ is the same as multiplying by 2.

(1)

(Total for Question 14 is 2 marks)

14 Gavin, Harry and Isabel each earn the same monthly salary.

Each month,

Gavin **saves** 28% of his salary and spends the rest of his salary

Harry spends $\frac{3}{4}$ of his salary and **saves** the rest of his salary

the amount of salary Isabel saves : the amount of salary she spends = 3 : 7

Work out who saves the most of their salary each month.
You must show how you get your answer.

Gavin

Save 28% Spend 72%

Harry

Save $\frac{1}{4}$ (25%) Spend $\frac{3}{4}$ (75%)

Isabel

Save 3 : 7

$\frac{3}{10}$ (30%) $\frac{7}{10}$ (70%)

Isabe saves the most each month.

May 2018 – Paper 1F **(Total for Question 14 is 4 marks)**

15 Work out $\frac{4}{5}$ of 210 cm.

168 cm

(1)

Specimen 1 – Paper 2F **(Total for Question 15 is 1 mark)**

16 Sam buys 20 boxes of oranges.
There are 25 oranges in each box.

$20 \times £7 = £140$ spent

Each boxes of oranges costs £7

Sam sells $\frac{2}{5}$ of the oranges he bought.

He sells each of these oranges for 40p.

He then sells each of the remaining oranges at 3 oranges for 50p.

Did Sam make a profit or did Sam make a loss?
You must show working to justify your answer.

$20 \times 25 = 500$ oranges

$\frac{2}{5}$ of $500 = 200$

$200 \times 40p = £80$

$\frac{300}{3} = 100$

$100 \times 50p = £50$

Spent £140 ⟶ made £130

Sam made a loss of £10

(Total for Question 16 is 5 marks)

16 An exam has two papers, Paper 1 and Paper 2

Paper 1 has 60 marks.
Paper 2 has 90 marks. > 150 marks

The pass mark is $\frac{2}{3}$ of the total number of marks.

Danielle gets 70% of the marks for Paper 1

How many of the marks for Paper 2 must Danielle get in order to get the pass mark?

70% of 60 = 42 marks

$\frac{2}{3}$ of 150 = 100 marks

Danielle needs to score 58 to pass.

(Total for Question 16 is 4 marks)

16 Alan, Bispah and Chan share a sum of money.

Alan gets $\frac{1}{8}$ of the money.

Bispah gets $\frac{1}{2}$ of the money.

Chan gets the rest of the money.

Alan gets £2.50

Work out how much money Bispah gets.

$\frac{1}{8} = £2.50$

$\frac{8}{8} = £20$

£ 10

(2)

May 2018 – Paper 3F

(Total for Question 16 is 2 marks)

17 There are some chocolates in a box.

$\frac{1}{4}$ of the chocolates contain nuts.

The rest of the chocolates do not contain nuts.

Write down the ratio of the number of chocolates that contain nuts to the number of chocolates that do not contain nuts.
Give your answer in the form 1 : n

nuts no nuts

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

$\frac{1}{4} : \frac{3}{4}$

1 : 3

May 2018 – Paper 1F

(Total for Question 17 is 2 marks)

17 Amelia, Hayden and Sophie did a test.
The total for the test was 75 marks.

Amelia got 56% of the 75 marks.

Hayden got $\frac{8}{15}$ of the 75 marks.

Sophie got 43 out of 75

Who got the highest mark?
You must show all your working.

(A) 56% of 75 = 42 marks

(H) $\frac{8}{15}$ of 75 = 40 marks

(S) = 43 marks.

Sophie got the highest mark.

(Total for Question 17 is 3 marks)

18 There are 240 cans of drink on a shelf.
Each can contains cola or lemonade or orange.

$$\text{the number of cans of cola} : \text{the number of cans of lemonade} : \text{the number of cans of orange} = 5:3:2$$

$\frac{1}{2}$ of the cans of lemonade and $\frac{1}{12}$ of the cans of orange are removed from the shelf.

Work out the number of cans of cola as a percentage of the total number of cans of drink remaining on the shelf.

Cola : lemonade : orange

5 : 3 : 2

120 : 72 : 48

$-\frac{1}{2}$ $-\frac{1}{12}$

120 : 36 : 44

$\text{Cola} = \frac{120}{200} = \frac{60}{100}$

60 %

(Total for Question 18 is 5 marks)

18 On Saturday, some adults and some children were in a theatre.
The ratio of the number of adults to the number of children was 5 : 2

Each person had a seat in the Circle or had a seat in the Stalls.

$\frac{3}{4}$ of the children had seats in the Stalls.
117 children had seats in the Circle.

There are exactly 2600 seats in the theatre.

On this Saturday, were there people on more than 60% of the seats?
You must show how you get your answer.

stall $\frac{3}{4} = 351$ circle $\frac{1}{4} = 117$

$= 468$ children

A : C
5 : 2

1170 : 468

1638 people on Saturday

$\frac{1638}{2600} = 0.63 = 63\%$

There were more than 60%

(Total for Question 18 is 5 marks)

18 Daniel bakes 420 cakes.
He bakes only vanilla cakes, banana cakes, lemon cakes and chocolate cakes.

$\frac{2}{7}$ of the cakes are vanilla cakes.

35% of the cakes are banana cakes.

The ratio of the number of lemon cakes to the number of chocolate cakes is 4 : 5

Work out the number of lemon cakes Daniel bakes.

$\frac{2}{7}$ of 420 = 120 vanilla.

35% of 420 = 147 banana

153 cakes left

lemon : chocolate

4 : 5

68 : 85

68

(Total for Question 18 is 5 marks)

18 There are 500 passengers on a train.

$\frac{7}{20}$ of the passengers are men.

40% of the passengers are women.

The rest of the passengers are children.

Work out the number of children on the train.

$\frac{7}{20}$ of 500 = 175 men

40% of 500 = 200 women

125 children

125

(Total for Question 18 is 3 marks)

19 There are 400 counters in a box.
The counters are red or yellow or green.

$\frac{3}{8}$ of the counters are red.

82 of the counters are yellow.

What percentage of the counters are green?

$\frac{3}{8}$ of 400 = 150 red

82 yellow

168 green

$\frac{168}{400} = \frac{21}{50} = \frac{42}{100}$

42 %

(Total for Question 19 is 4 marks)

19 Rachel, Samina and Tom share £600 between them.

Rachel gets $\frac{2}{5}$ of the £600

Samina gets $\frac{1}{4}$ of the money that is left over.

Tom gets the rest of the money.

Tom says,
"I would have got more money if we had shared the £600 equally between us."

Is Tom correct?
You must show how you get your answer.

$\frac{2}{5}$ of 600 = 240 (Rachel)

600 − 240 = 360 left

$\frac{1}{4}$ of 360 = 90 (Samina)

360 − 90 = £270 (Tom)

Tom is wrong, he would have gotten less (£200) is shared equally.

(Total for Question 19 is 4 marks)

19 A shop sells milk in 1 pint bottles and in 2 pint bottles.

Each 1 pint bottle of milk costs 52p.
Each 2 pint bottle of milk costs 93p.

Martin has **no** milk.

He assumes that he uses, on average, $\frac{3}{4}$ of a pint of milk each day.

Martin wants to buy enough milk to last for 7 days.

(a) Work out the smallest amount of money Martin needs to spend on milk.
You must show all your working.

$7 \times \frac{3}{4} = \frac{21}{4} = 5\frac{1}{4}$

$5\frac{1}{2}$ = 6 pints (3 x 2 pints)

3 x 93p = £2.79

£ 2.79

(3)

Martin actually uses more than $\frac{3}{4}$ of a pint of milk each day.

(b) Explain how this might affect the amount of money he needs to spend on milk.

He may need to buy more milk, which means he will have to spend more money

(1)

(Total for Question 19 is 4 marks)

23 Costcorp sells packets of mints to shop owners.

On Monday three shop owners buy mints from Costcorp.
Each shop owner buys small packets, medium packets and large packets of mints.

Alan buys 400 packets of mints.
32% are small packets.
40% are large packets.

Beryl buys 500 packets of mints.

$\frac{3}{10}$ are small packets.

$\frac{1}{10}$ are large packets.

Charlie buys 150 small packets of mints so that

number of small packets : number of medium packets = 3 : 4

Work out the total number of medium packets of mints these shop owners buy.
You must show all your working.

Alan

32% of 400 = 128 small
40% of 400 = 160 large
112 medium

Beryl

$\frac{3}{10}$ of 500 = 150 small
$\frac{1}{10}$ of 500 = 50 large
300 medium

Charlie
150 small
200 medium

112 + 300 + 200

612

(Total for Question 23 is 5 marks)

25 A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.
25% of the cars use diesel.
The rest of the cars use petrol.

Work out the number of cars that use petrol.
You must show all your working.

160
Cars : Vans
3 : 7
48 : 112

$\frac{1}{8}$ of 48 = 6 electric cars

25 of 48 = 12 diesel cars

30 petrol cars

30

(Total for Question 25 is 5 marks)