

Name	Date started	Target end date
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## WJEC GCSE Mathematics and Numeracy (Double Award) – Question Pack

Fraction arithmetic and equivalence: simplifying fractions, finding equivalent forms, and adding, subtracting, multiplying and dividing fractions and

# REVISE

.wales

## F2.04 – Fraction arithmetic & equivalence

### *Spec 1.4.1, 1.4.2, 1.4.3, 1.4.4, 1.4.5, 1.4.6, 1.4.7 – Unit 2 (no calculator)*

*Fraction arithmetic and equivalence: simplifying fractions, finding equivalent forms, and adding, subtracting, multiplying and dividing fractions and mixed numbers without a calculator. Sourced from legacy WJEC GCSE Mathematics-Numeracy Foundation papers (3300U10/U20) and accessible content from Intermediate papers (3300U30/U40), organised for revision under the 2025 spec.*

#### 2025 SPECIFICATION

### Estimated time for entire question pack: ~1 hours 27 minutes

*Derived from the GCSE Higher pace of ~1.5 min/mark (58 marks across 30 questions).*

*You are advised to **not** attempt to complete all of this in one sitting.*

### ABOUT THIS QUESTION PACK

This is a **focused single-topic practice pack**, not a single mock paper. Questions are organised against the 2025 specification. Questions are ordered chronologically by sitting, with custom-written and SAM questions at the end.

### INSTRUCTIONS

Use black ink or black ball-point pen. Show all working – method marks are awarded for clear setup.

*A calculator is **not** permitted on any question in this pack (Unit 2 is the non-calculator paper).*

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# Fraction arithmetic & equivalence – what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 2: non-calculator.

## Equivalence & simplifying 1.1.2

- Recognise equivalent fractions.
- Simplify a fraction to its lowest terms.
- Compare fractions by writing with a common denominator.

## Add & subtract fractions 1.1.2

- Find a common denominator.
- Add or subtract numerators, keep denominator.
- Convert mixed numbers to improper fractions first.

## Multiply & divide fractions 1.1.2

- Multiply top  $\times$  top and bottom  $\times$  bottom.
- Divide by multiplying by the reciprocal.
- Cancel before multiplying where possible.

## Exam strategy 1.1

- Non-calculator – show every step of the working.
- Always simplify the final answer.
- Convert mixed numbers before multiplying or dividing.

# Fraction arithmetic & equivalence in one page

Quick-reference notes – revisit before each question. Don't use during the questions.

## Equivalent fractions

Multiply or divide top and bottom by the same number.

$$2/3 = 4/6 = 6/9 = 10/15.$$

## Simplifying

Divide top and bottom by their **HCF**.

$$18/24 \rightarrow \div 6 \rightarrow 3/4.$$

## Adding & subtracting

common denominator first

$$1/3 + 1/4 = 4/12 + 3/12 = 7/12.$$

Keep the denominator, combine numerators.

## Multiplying

$$a/b \times c/d = (a \times c)/(b \times d)$$

$$2/3 \times 4/5 = 8/15. \text{ Simplify at the end.}$$

## Dividing (KFC)

Keep · Flip · Change

Keep the first, flip the second, change + to ×.

$$2/3 \div 4/5 = 2/3 \times 5/4 = 10/12 = 5/6.$$

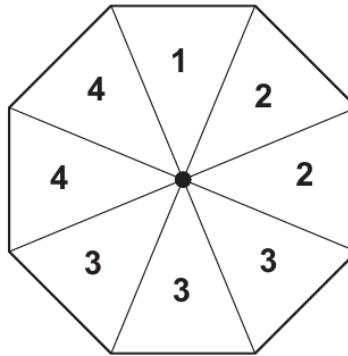
## Mixed numbers

Convert to improper fractions before × or ÷.

$2\frac{1}{2} = 5/2$ . Convert back to a mixed number at the end if needed.

Examiner  
only

11. Seren has a fair 8-sided spinner.  
The sections of the spinner are numbered 1, 2, 2, 3, 3, 3, 4, 4.

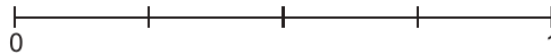


- (a) Which number is the spinner most likely to land on? [1]

- (b) Circle one term from the list below that describes the probability of the spinner landing on a 2. [1]

**impossible**      **unlikely**      **even chance**      **likely**      **certain**

- (c) On the probability scale below, mark with an arrow the probability of the spinner landing on a 3. [1]

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Examiner only

3. The table below shows some values of  $y = x - 3$  for values of  $x$  from  $-4$  to  $6$ .

$x$	$-4$	$-2$	$0$	$2$	$4$	$6$
$y = x - 3$	$-7$		$-3$			$3$

(a) Complete the table above.

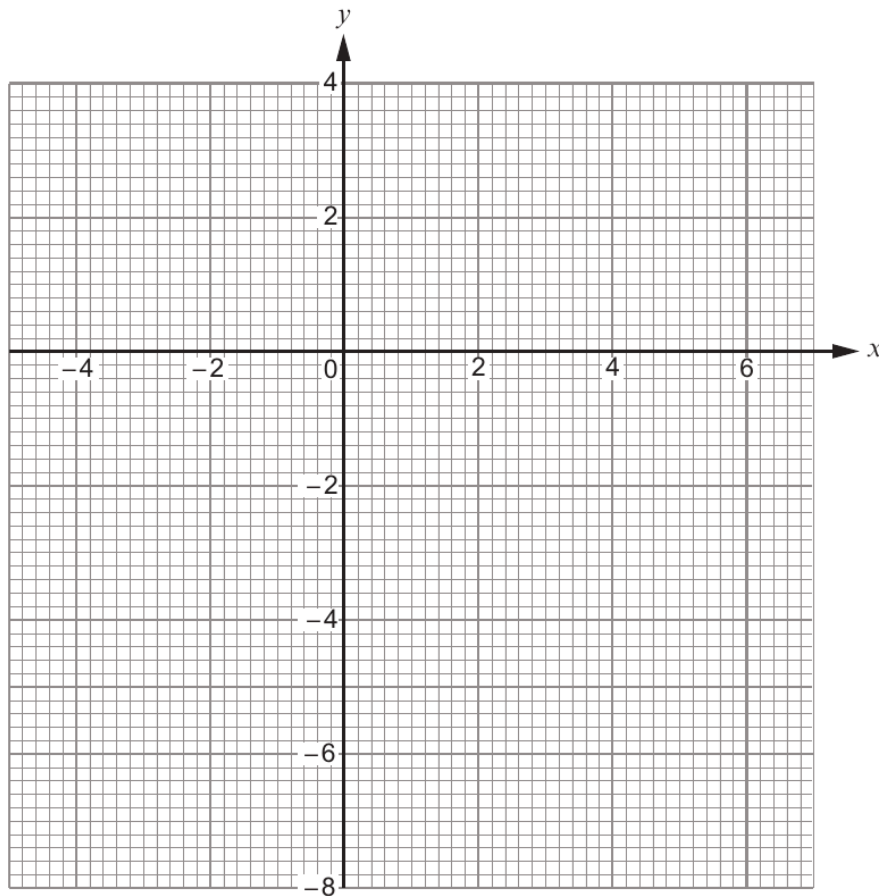
[2]

.....

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(b) On the graph paper below, draw the graph of the straight line  $y = x - 3$  for values of  $x$  from  $-4$  to  $6$  only.

[2]



Examiner  
only

- (c) The straight line you have drawn on the graph for values of  $x$  **from  $-4$  to  $6$**  is a diagonal of a square.

Write down the coordinates of the four corners of this square.

[2]

( ..... , ..... )    ( ..... , ..... )    ( ..... , ..... )    ( ..... , ..... )

13. A bag contains a number of different coloured balls.  
A ball is selected at random from the bag.  
The probability of selecting a blue ball is  $0.3$ .

- (a) Why is the following statement incorrect?  
Explain your answer clearly.

[1]

'More than half the balls in the bag are blue.'

.....  
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- (b) What is the probability that a ball selected at random from the bag is not blue?

[1]

.....

- (c) There are 50 balls in the bag.  
How many of them are blue?

[2]

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Examiner  
only

15. Which of the following fractions is nearest to  $\frac{1}{4}$ ?

$$\frac{1}{5}$$

$$\frac{7}{25}$$

$$\frac{13}{50}$$

You must show all your working.

[3]

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Answer .....



Examiner  
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5. Complete the table below so that each row will show equivalent fractions, decimals and percentages.  
The first row has been completed for you. [4]

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{10}$	.....	..... %
$\frac{.....}{25}$	.....	8%

6. (a) Calculate  $3 + 5 \cdot 4^2$ . [1]

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.....

- (b) Calculate  $\frac{\sqrt{2 \cdot 56}}{4}$ . [1]

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<p>2. (a) Add 4571 and 862.</p>	Examiner only [1]
<p>.....</p> <p>.....</p> <p>.....</p>	
<p>(b) Subtract 643 from 817.</p>	[1]
<p>.....</p> <p>.....</p> <p>.....</p>	
<p>(c) Calculate one quarter of 300.</p>	[1]
<p>.....</p> <p>.....</p> <p>.....</p>	
<p>(d) Gwilym thinks of a number. When he divides his number by 7, he gets an answer of 6. When he divides his number by 2, what should his answer be?</p>	[2]
<p>.....</p> <p>.....</p> <p>.....</p>	
<p>3. (a) Write 637 correct to the nearest 100.</p>	[1]
<p>.....</p>	
<p>(b) Write 3892 correct to the nearest thousand.</p>	[1]
<p>.....</p>	



Examiner only

7. (a) Calculate  $\frac{\sqrt{0.9216}}{8}$ . [1]

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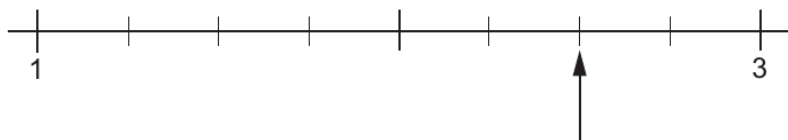
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(b) Calculate  $\frac{3}{5}$  of 632. [2]  
Write your answer as a decimal.

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(c) A number line is shown below. [1]  
To which number is the arrow pointing?



.....

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8. Complete the table below so that each row will show equivalent fractions, decimals and percentages. [4]  
The first row has been completed for you.

Fraction	Decimal	Percentage
$\frac{1}{4}$	0.25	25%
.....	0.3	.....%
$\frac{.....}{20}$	.....	45%



Examiner  
only

3. (a) Which one of these numbers is both a square number **and** an even number?  
Circle the correct answer. [1]

2      9      12      16      17

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(b) Write 75% as a fraction in its lowest terms. [1]

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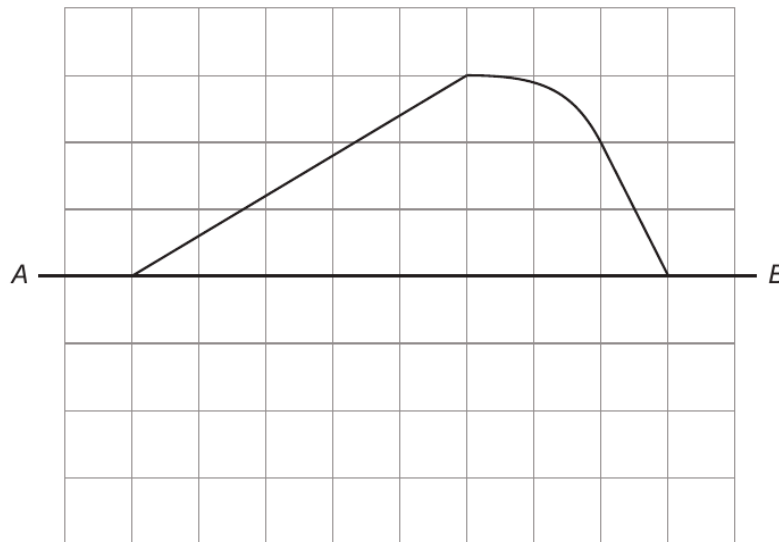
(c) Write down the mode of these numbers. [1]

28      31      28      29      31      28      34      24      32

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Mode is .....

4. Draw a reflection of this shape in the line AB. [2]



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7. (a) Simplify  $12a - 19a + 10a$ . [1]

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(b) Solve the following equations.  
(i)  $3y = 189$  [1]

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(ii)  $27 - x = 15$  [1]

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(c) Write down the value of  $\sqrt{36}$ . [1]

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8. A sack contains 5.4 kg of potatoes.  
A second sack contains 3.08 kg of potatoes.  
A third sack contains 2.2 lb (**pounds**) of potatoes.  
Calculate the total mass of these potatoes.  
Give your answer in **kilograms**. [3]

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Examiner  
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7. (a) Describe **in words** the rule for continuing the sequence below. [1]

79, 65, 51, 37, ...  
Rule:

.....  
.....

- (b) Write down the next term in the sequence below. [1]

46, 92, 184, 368, .....

.....

- (c) Adrian has  $n$  grapes. He eats 4 of them. [1]  
Write down, in terms of  $n$ , the total number of grapes Adrian now has.

.....

8. Complete the table below so that each row will show equivalent fractions, decimals and percentages. [4]  
The first row has been completed for you.

Fraction	Decimal	Percentage
$\frac{1}{4}$	0.25	25%
$\frac{7}{10}$	.....	..... %
$\frac{.....}{20}$	.....	5%

.....

9. Find  $\sqrt{11.56} + 2.5^2$ . [1]

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Examiner only

2.



The table below shows the number of visitors to some of the top attractions in Wales in 2017 and 2018.

The table also shows the percentage change in the number of visitors from 2017 to 2018.

Attraction	Number of visitors 2017	Number of visitors 2018	Percentage change
Folly Farm	480 000	455 428	-5.1%
Cardiff Castle	319 131	452 007	+41.6%
Bodnant Garden	255 949	260 153	+1.6%
Caernarfon Castle	204 675	205 009	+0.2%
Conwy Castle	221 652	201 961	-8.9%
Zip World Slate Caverns	190 000	195 000	+2.6%

Use the information in the table above to answer the following questions.

- (a) Zip World Slate Caverns had 195 000 visitors in 2018.  
Write this number in words. [1]

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- (b) Which attraction had the smallest percentage change from 2017 to 2018? [1]

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- (c) Calculate the total number of visitors to Bodnant Garden in 2017 and 2018. [2]

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- (d) Calculate the difference between the number of visitors to Cardiff Castle in 2017 and the number of visitors to Cardiff Castle in 2018. [2]

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- (e) Ian looks at the data and says,

"In 2018, Folly Farm had about half a million visitors."

Is Ian correct?  
Give a reason for your answer.

[1]

Yes       No

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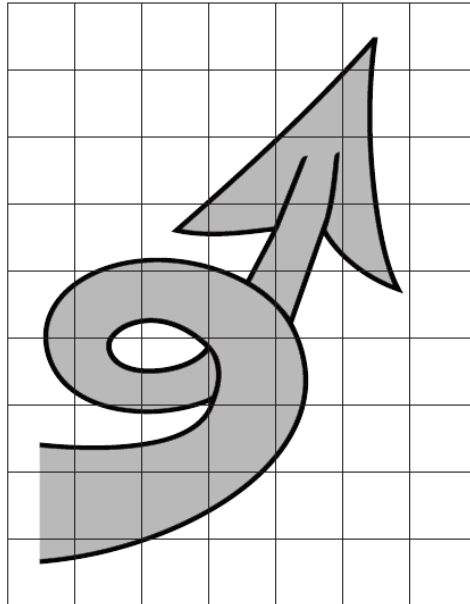
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- (f) A new visitor attraction, Tailspin, wants to use the tail of the dragon from the Welsh flag as its logo.

The tail is drawn on the centimetre square grid below.  
Each square on the grid represents an area of  $4\text{ cm}^2$ .



Tailspin is planning to make flyers to advertise the attraction.  
To print the flyers, the area of the tail must be less than  $48\text{ cm}^2$ .

The manager of Tailspin thinks that the area of the tail is greater than  $48\text{ cm}^2$ .

Decide whether or not the manager is correct.  
You must show all your working.

[3]

The manager is:

Correct

Not correct

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3. (a) The Royal National Lifeboat Institution (RNLI) bought a new lifeboat.

The lifeboat was funded as follows:

- 2% from government sources
- 94% from donations
- 4% from other sources.



The new lifeboat cost £2.2 million.

How much of the cost of this lifeboat was funded from government sources?

Write your answer in figures only.

[3]

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- (b) 1800 medals were awarded to RNLI crew members in recent years. The distribution of the medals is shown accurately in the pie chart below.



- (i) What fraction of the medals awarded were bronze?  
Circle your answer.

[1]

$$\frac{135}{360}$$

$$\frac{245}{360}$$

$$\frac{65}{360}$$

$$\frac{115}{360}$$

$$\frac{75}{360}$$

.....

- (ii) How many gold medals were awarded?  
You must show all your working.

[3]

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- 6. Delyth and Ronnie are both students at the local college.
  - (a) Their houses and the college are all joined by straight roads, as shown in the diagram.

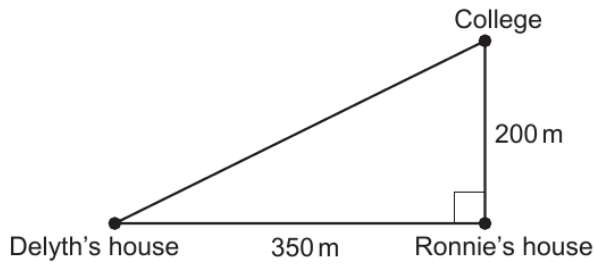


Diagram not drawn to scale

Delyth usually walks directly to college.  
Calculate how much further Delyth has to walk if she passes Ronnie's house on her way to college. [5]

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Examiner  
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- (b) 35 students were asked how far they travelled to the college.  
The results are recorded in the table below.

Distance, $d$ (metres)	Frequency
$100 < d \leq 200$	9
$200 < d \leq 1000$	10
$1000 < d \leq 3000$	15
$3000 < d \leq 7000$	1

- (i) Ronnie is one of these 35 students.  
He walks 200 m directly to college.

Does Ronnie travel further than the median distance travelled by these 35 students?

Yes       No       Can't tell

You must give a reason for your answer.

[1]

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- (ii) Calculate an estimate of the mean distance these 35 students travelled to the college.

[4]

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Estimate of the mean distance travelled by these 35 students is ..... m



Examiner  
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(c) There are 140 students who travel by bus to and from college.

Delyth wants to find out why these students do not walk to college.  
She has decided to use a systematic sampling method to select 7 of these students to form a discussion group.

The names of all the 140 students are in a list.  
Delyth has randomly selected the 2nd student in the list to join the discussion group.

Complete the table below to give the positions in the list of the 7 students selected to join the discussion group. [2]

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Student	1	2	3	4	5	6	7
Position in the list	2nd	.....	.....	.....	.....	.....	.....





Examiner  
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19. (a) Express 48 as a percentage of 400. [2]

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(b) Share £45 in the ratio 8 : 1. [2]

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£ ..... and £ .....

(c) Express  $1 - \frac{1}{2^3}$  as a single fraction in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers. [2]

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Answer = .....



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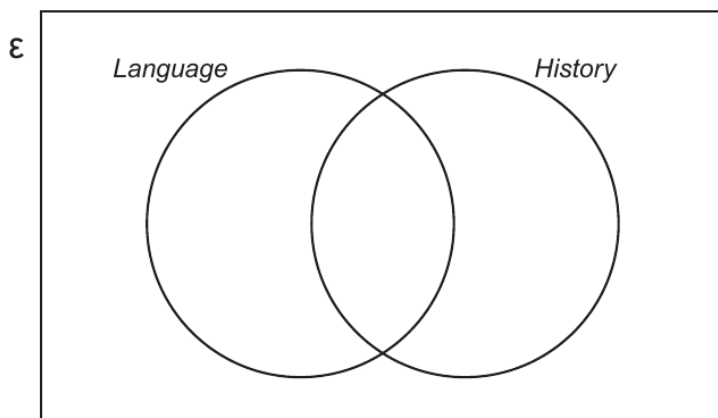
19. A bus going to a *Welsh Heritage* conference has 43 people on board.  
There are 38 students, 4 tutors and a driver on the bus.

At the conference, each student will attend a session on *Language*, a session on *History* or both sessions.

- All the students will attend at least one session.
- 18 students will attend both sessions.
- 25 students will attend the session on *History*.
- The tutors and driver will not attend either of the sessions.

(a) Complete the Venn diagram below to show this information.  
The universal set,  $\mathcal{E}$ , contains all of the 43 people on the bus.

[3]



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(b) One of the people on the bus is chosen at random.  
What is the probability that this person will attend the session on *Language*?

[2]

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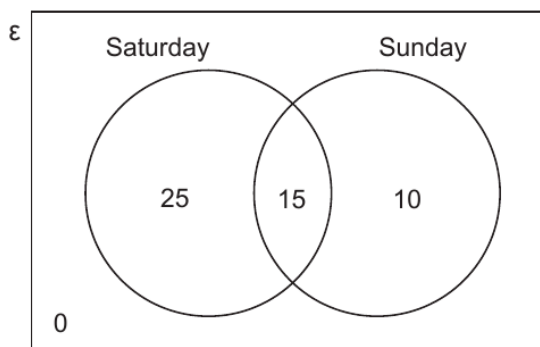


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1. Delyth buys 50 tickets for a group of friends to go to a music festival. The ticket prices are given below.

Ticket for	Ticket price per person
Saturday only	£20
Sunday only	£17
Both days	£28

The Venn diagram below shows the number of tickets that Delyth buys.



- (a) What fraction of the group has tickets for both days? Give your answer in its simplest form. [2]

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- (b) Calculate the total cost of the 50 tickets. You must show all your working. [4]

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Total cost of the 50 tickets is £ .....



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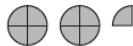
2. A website lists the number of passengers who used UK airports in 2018.



- (a) The table below shows some of these numbers. They have been rounded to the nearest million. One of the numbers is also represented in the pictogram below.

Airport	Number of passengers (to the nearest million)
Cardiff	.....
Bristol	9 000 000
Birmingham	.....
Exeter	.....
Leeds-Bradford	4 000 000

Key:  represents 4 000 000 passengers

Airport	
Cardiff	
Bristol	
Birmingham	
Exeter	
Leeds-Bradford	

In the table:

- the number of passengers who used Cardiff was 50% of the number of passengers who used Leeds-Bradford
- the number of passengers who used Birmingham was 3 times the number of passengers who used Leeds-Bradford
- the number of passengers who used Exeter was  $\frac{1}{4}$  of the number of passengers who used Leeds-Bradford.

Complete the table **and** the pictogram.

[6]

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Examiner  
only

(b) In 2018, approximately eighty million passengers used Heathrow airport.

(i) The number of passengers who used Gatwick airport in 2018 was 46 086 089.  
Chris said:

“Gatwick had more than half the number of passengers that Heathrow had.”

Is Chris correct?  
Give a reason for your answer.

[1]

Yes

No

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.....

(ii) On the busiest day, two hundred and sixty-one thousand nine hundred and nine passengers used Heathrow airport.  
Write this number using digits.

[1]

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(c) A plane flying from the UK to Corfu used 2508 litres of fuel per hour.  
The flight was 3 hours long.  
How many litres of fuel did the plane use?

[2]

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Examiner  
only

7. Write 27 minutes and 11 seconds in **seconds**. [2]

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27 minutes and 11 seconds = ..... seconds

8. (a) Find the value of  $\frac{144 \times 30^2}{18}$ .  
Write your answer correct to the nearest thousand. [2]

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(b) Calculate 4% of £250. [2]

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(c) Laura thinks of a number.  
 $\frac{1}{5}$  of her number is 14.  
What is 50% of Laura's number? [3]

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50% of Laura's number is .....

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Examiner  
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2. (a) There is one square number between 180 and 200.  
What is this square number?

[1]

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- (b) A number has exactly **four** factors.  
All of the factors are less than 30.  
Three of the factors are 1, 2 and 26.  
What is the other factor?

[1]

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- (c) *In this part of the question, you will be assessed on the quality of your accuracy in writing.*

Which length is exactly halfway between 280 m and 410 m?  
You must show all your working.

[2 + 1 W]

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Examiner  
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4. (a) Circle **all** the fractions that are equal to  $\frac{5}{6}$ . [2]

$$\frac{45}{56}$$

$$\frac{55}{66}$$

$$\frac{45}{46}$$

$$\frac{35}{42}$$

$$\frac{51}{61}$$

(b) Calculate  $\frac{\sqrt{0.64}}{4^2}$ . [1]

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(c) Here are four digits.

7

3

6

5

Write the four digits in the following boxes to form two 2-digit numbers.  
You need to arrange the four digits so that the **product** is as **small** as possible.

You can use each digit only once.

[2]

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Space for working:

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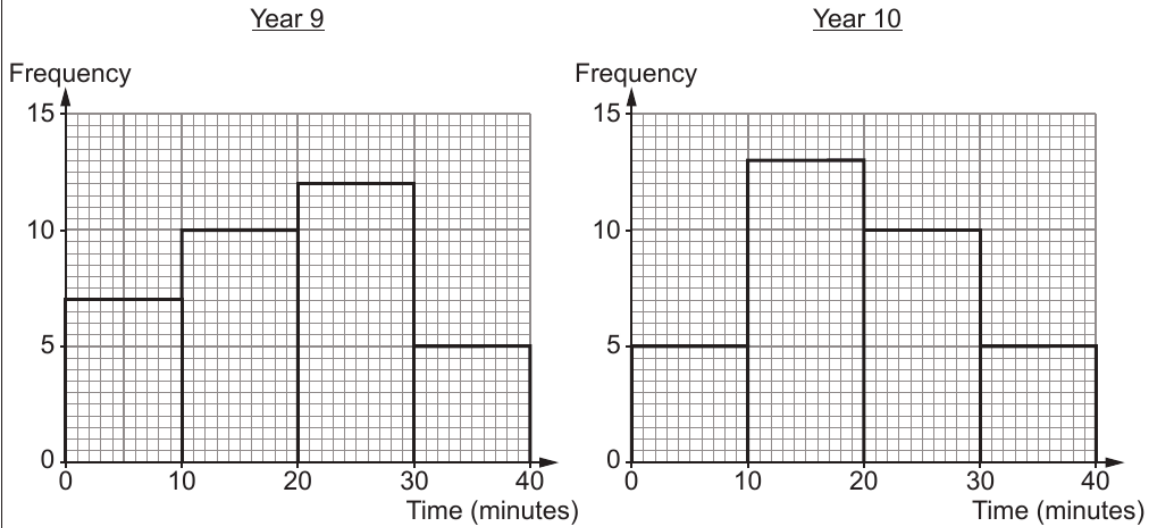


Examiner only

4. Miss Hughes asked her class of Year 9 pupils and her class of Year 10 pupils how many minutes they each spent on their mathematics homework last weekend.

The frequency diagrams below show the results.  
The groups used are as follows:

$$0 \leq \text{time} < 10, \quad 10 \leq \text{time} < 20, \quad 20 \leq \text{time} < 30 \quad \text{and} \quad 30 \leq \text{time} < 40.$$



- (a) What is the modal group of the times for the Year 9 pupils? [1]

.....

- (b) How many of the Year 10 pupils spent 20 minutes or more on their mathematics homework last weekend? [1]

.....

- (c) Did any of the Year 10 pupils spend **no** time on their mathematics homework last weekend?

Yes       No       Can't tell

You must give a reason for your answer. [1]

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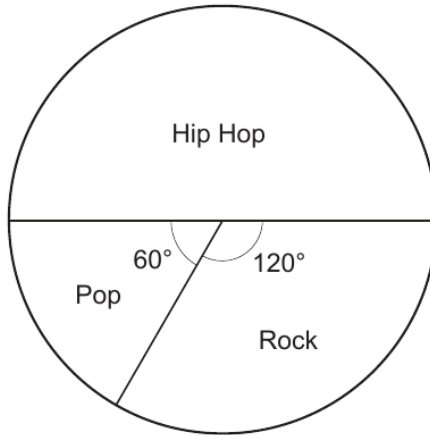
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7. Mrs Lewis asked each student in Year 11 what kind of music they preferred. She gave the students three options: Hip Hop, Pop and Rock. The pie chart below shows the results.



- (a) Mrs Lewis chooses one of the students at random. What is the probability that this student chose Hip Hop? [1]

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- (b) 45 students chose Hip Hop. How many students are there in total? [2]

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- (c) What fraction of these students chose Pop? [2]

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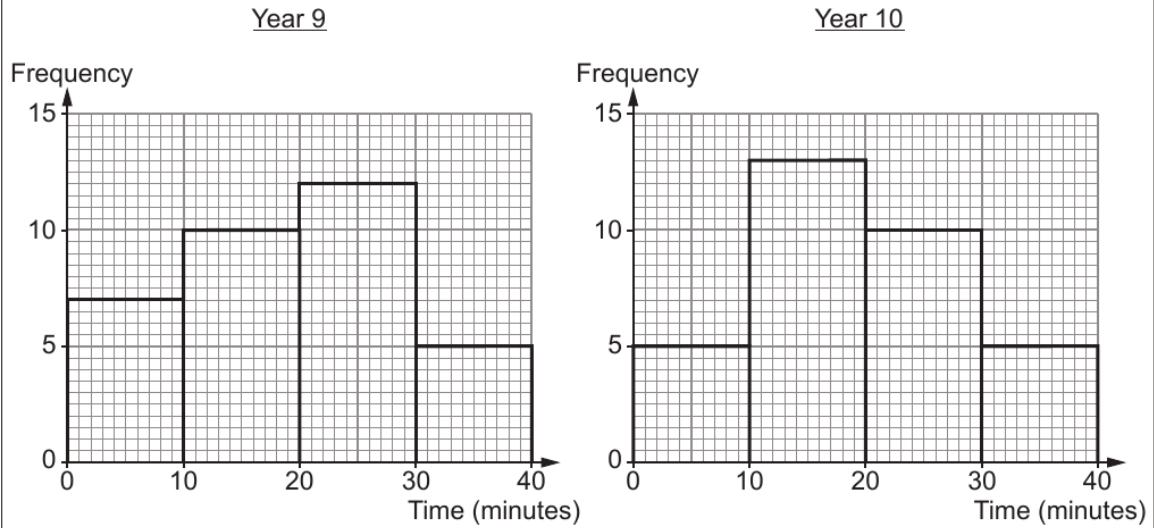


Examiner only

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.....

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.....

- (c) Did any of the Year 10 pupils spend **no** time on their mathematics homework last weekend?

Yes  No  Can't tell

You must give a reason for your answer. [1]

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Examiner  
only

- (d) Delyth calculates the following:
- the fraction of the Year 9 pupils who spent between 30 and 40 minutes on their homework
  - the fraction of the Year 10 pupils who spent between 30 and 40 minutes on their homework.

Delyth says,

"These fractions are exactly the same."

Is Delyth correct?

Yes

No

You must give a reason for your answer.

[1]

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**END OF PAPER**



11. Steffan uses 654 kWh of electricity in a three-month period.

Electricity costs £0.30 per kWh.  
The standing charge for the three-month period is £54.  
Steffan has to pay VAT at 5% on the **total** cost.

Calculate Steffan's electricity bill.  
You must show all your working.

[5]

Examiner  
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