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WJEC GCSE Mathematics and Numeracy (Double Award) – Question Pack

Ratio in context: sharing in a ratio, equivalent ratios, scaling and map scales. Sourced from legacy WJEC GCSE Mathematics and Mathematics-Numeracy Hi

REVISE
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1.11 – Ratio in context

Spec 1.10.1, 1.10.2 – Unit 1 (calculator allowed)

Ratio in context: sharing in a ratio, equivalent ratios, scaling and map scales. Sourced from legacy WJEC GCSE Mathematics and Mathematics-Numeracy Higher papers, organised for revision under the 2025 spec.

2025 SPECIFICATION

Estimated time for entire question pack: ~1 hours 21 minutes

Derived from the GCSE Higher pace of ~1.5 min/mark (54 marks across 13 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 allowed on every question in this pack (Unit 1 is the calculator-allowed paper).

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Ratio in context – what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 1: calculator-allowed.

Sharing in a ratio 1.10.1

- Add the parts → total parts.
- Value per part = total ÷ total parts.
- Each share = ratio number × value per part.

Equivalent ratios 1.10.1

- Multiply or divide both sides by the same number.
- Simplest form: divide by the HCF.
- Compare ratios by reducing to the same first term.

Ratio as fractions 1.10.1

- In $a : b$, first part is $\frac{a}{a+b}$ of the whole.
- Convert between ratio and fraction to combine with %s.
- Useful when total is unknown but a part is given.

Map scales & scaling 1.10.2

- Scale $1 : k$ – multiply map distances by k to get real distances.
- Keep units consistent (cm ↔ m ↔ km).
- Recipes scale up/down: multiply all ingredients by the same factor.

Ratio in context in one page

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

Sharing in a ratio

£720 in 2 : 7.

Total parts = 9 \Rightarrow one part = $720 \div 9 =$
£80.

Shares: $2 \times 80 = \text{£}160$ and $7 \times 80 =$
£560.

Three-part ratios

£400 shared 1 : 2 : 5.

Total parts = 8; one part = £50.

Largest share = $5 \times 50 = \text{£}250$.

Equivalent ratios

Simplify by dividing both sides by HCF.

$15 : 25 = 3 : 5$.

$1.2 : 0.4 = 12 : 4 = 3 : 1$.

Ratio \leftrightarrow fraction

In 3 : 7, the first part is $\frac{3}{10}$ of the total.

The total of the ratio parts is the
denominator.

Map / scale problems

Scale 1 : 50 000 means 1 cm on the map
= 50 000 cm = 500 m on the ground.

Scale up the 'real' quantity by the same
factor.

Common traps

- Forgetting to add all parts to get the total.
- Using the small number as the "one part".
- Mixing units when scaling (cm vs km).

Examiner
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(iii) Find the ratio that is now used to share the money between Lotty and Rafael.
Express your answer in its simplest form. [3]

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Lotty's winnings : Rafael's winnings = :

(b) In another prize draw, it was planned to give £5000 as the first prize.
To make it more popular, the organisers decide to increase this first prize by 26%.

The most efficient method of calculating the amount of the increased first prize is

$$1.26 \times 5000.$$

The second prize was planned to be £3000, but it is now decided to decrease this prize by 6%.

Write down the most efficient method of calculating the amount of the decreased second prize.
You are not expected to work out the answer. [1]

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5. Rhodri has carried out an experiment to measure the diameters of 20 spherical dust particles, in microns.

Here are his results.

Diameter, d (microns)	Frequency
$1 \leq d < 2$	2
$2 \leq d < 4$	6
$4 \leq d < 5$	8
$5 \leq d < 9$	4

- (a) (i) Calculate an estimate of the mean diameter of a dust particle. [4]

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- (ii) Rhodri measures the diameters of another 25 dust particles.
Rhodri is told,
'The ratio of dust particles with diameters less than 4 microns to those with diameters greater than or equal to 4 microns is 7 : 8.'
He finds this fact is true when he considers all 45 dust particles.
How many of the extra 25 dust particles have a diameter of less than 4 microns?
You must show your working. [3]

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Examiner
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1.



- (a) Jasmine entered herself, Sophie and Bryn as a group in a talent contest. Bryn only had a minor part.

Bryn, Sophie and Jasmine won the contest. They shared the prize money in the ratio 2 : 6 : 7, with Bryn getting the smallest share. Jasmine won £560, the largest share.

How much money did Bryn and Sophie each win? [4]

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Bryn receives £

Sophie receives £



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13. The front views of two mathematically similar milk cartons are shown below.



Diagram not drawn to scale

(a) Circle either TRUE or FALSE for each statement given below. [1]

STATEMENT		
The ratio of the lengths of the cartons is the same as the ratio of the heights of the cartons.	TRUE	FALSE
The ratio of the volumes of the cartons is the same as the ratio of the heights of the cartons.	TRUE	FALSE

(b) It is claimed that the larger carton contains double the amount of milk contained in the smaller carton.
 Show that this claim is not true.
 Explain your answer. [3]

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Examiner
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- (c) Another similar milk carton has a label with an area that is one quarter of the area of the label on the carton of height 24 cm.



Diagram not drawn to scale

Calculate the height of this new carton.

[3]

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Examiner only

3. Sara is carrying out a survey of the three villages, Cwm, Allthir and Gwyndir. The diagram below shows the positions of the three villages.

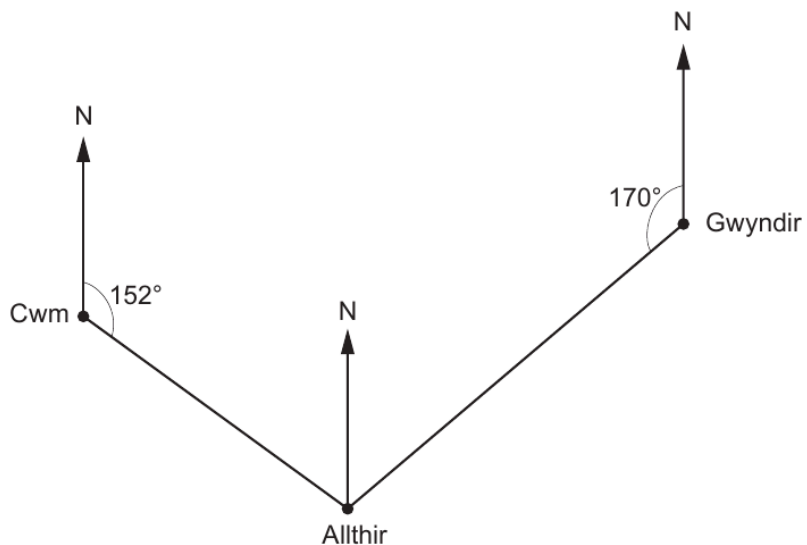


Diagram not drawn to scale

- (a) What is the bearing of Allthir from Gwyndir?
Circle your answer.

[1]

010° 170° 180° 190° 200°

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- (b) What is the bearing of Cwm from Allthir?
Circle your answer.

[1]

028° 152° 242° 332° 352°

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Examiner
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(c) The area of the land covered by the three villages is 200 km^2 .
The total population of the three villages is 8400 people.

(i) What is the population density of the three villages?
Give your answer in population/ km^2 .

[2]

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(ii) The populations of Cwm, Allthir and Gwyndir are in the ratio 3 : 4 : 5.
Calculate the population of Gwyndir.

[2]

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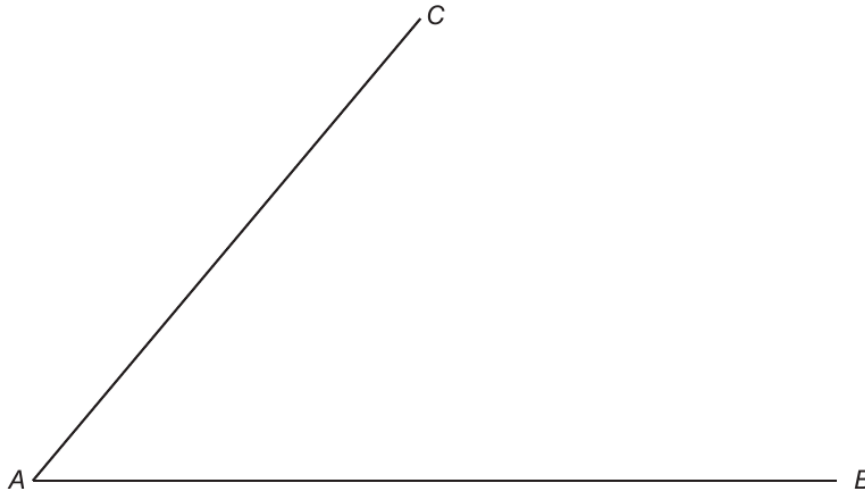
2. Two straight lines, AB and AC , are shown below.

The point P is

- equidistant from line AB and line AC ,
- 6 cm from point B ,
- **more** than 10 cm from point A .

Show clearly the position of point P .

[3]



3. (a) Share £720 in the ratio 2 : 7.

[2]

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(b) Calculate the value of the reciprocal of 0.2.

[2]

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4. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

A sum of money is shared in the ratio 3 : 4 : 7.
The smallest share is £210.

What is the total amount of money shared?
You must show all your working.

[4 + 2 OCW]

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1. In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.

The sizes of angles a and b in the triangle shown below are in the ratio 2 : 3.

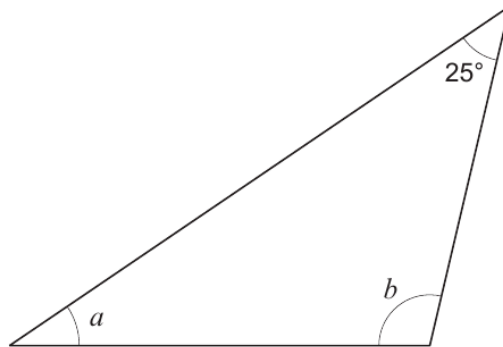


Diagram not drawn to scale

Calculate the size of each of the angles a and b .
You must show all your working.

[3 + 2 OCW]

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(b) Rhodri finds 2 venues that arrange party nights.

<p>Friar Hall Party night special</p> <p>£105 hall hire charge + £5 per person</p>



<p>Minfelin Lodge Party night special</p> <p>£207 room hire charge + £3 per person</p>

Rhodri calculates the total cost of organising the party at each venue. He finds that the total costs are the same. For how many people is Rhodri planning the 21st birthday party? You must show all your working.

[3]

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2. A supermarket sells 2 varieties of washing powder: Dazzle and Sparkle. Both washing powders are sold in 3.3 kg packets. The ratio of the prices of the washing powders is as follows.

$$\text{Dazzle} : \text{Sparkle} = 9 : 10$$

The price of a 3.3 kg packet of Sparkle is £4.40.

Calculate the **cost per kilogram** of Dazzle. You must show all your working.

[4]

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6. A solid statue is made from an alloy of copper and tin.
It has a volume of 150 cm^3 .

(a) In the statue, the volume of copper and the volume of tin are in the ratio $22 : 3$.

The density of copper is 8.96 g/cm^3 .

The density of tin is 7.31 g/cm^3 .

Calculate the mass of the statue.
You must show all your working.

[4]

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(b) The height of the statue is 12 cm .
A larger statue is mathematically similar to this statue.
It has a height of 21.6 cm .
Calculate the volume of this larger statue.

[3]

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10. Aled and Berwyn share £ x in the ratio 2 : 3.

- (a) Aled's share of the money is £ $0.4x$.
What is Berwyn's share of the money in terms of x ?

[1]

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- (b) Carys and Delyth share the same amount, £ x , in the ratio 3 : 7.

Show that one of these four people receives the same amount as the combined total of two of the other people. [3]

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11. Write $\frac{1}{4} \times 2^{400}$ in the form 2^n .

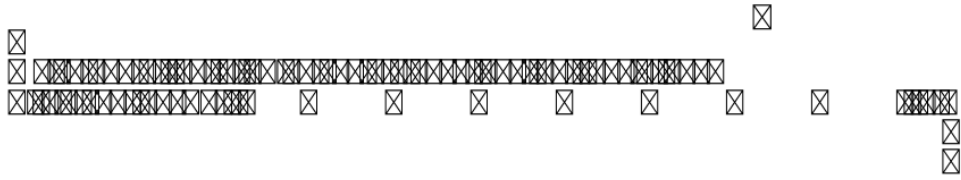
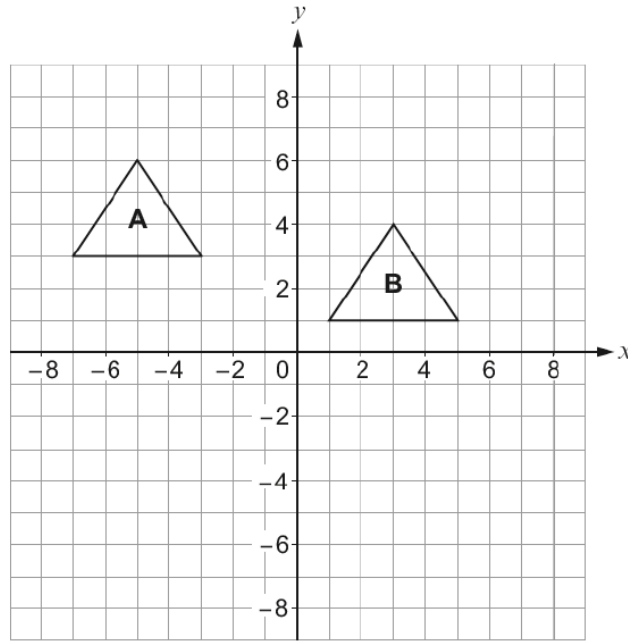
[1]

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- $\begin{pmatrix} \square \\ -\square \end{pmatrix}$
- $\begin{pmatrix} 2 \\ -8 \end{pmatrix}$
- $\begin{pmatrix} -\square \\ -\square \end{pmatrix}$
- $\begin{pmatrix} -2 \\ 8 \end{pmatrix}$
- $\begin{pmatrix} -\square \\ \square \end{pmatrix}$

