Name	Date started	Target end date

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

Foundation critical thinking with statistics: spotting misleading bar charts, line graphs and pictograms (truncated axes, distorted scales, missing ca

REVISE
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F3.13 — Misleading graphs & drawing valid conclusions

Spec 4.2.21, 4.2.22, 4.2.23 — Unit 3 (calculator allowed)

Foundation critical thinking with statistics: spotting misleading bar charts, line graphs and pictograms (truncated axes, distorted scales, missing categories) and judging whether a conclusion is supported by the data. 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: ~21 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (14 marks across 11 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 3 is the calculator-allowed paper).

Misleading graphs & drawing valid conclusions — what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 3: calculator-allowed.

Critiquing diagrams 4.5.1

- Spot truncated or non-zero axes.
- Spot unequal scales.
- Identify missing data or categories.

Misleading pictograms 4.5.2

- Check the key is clear and consistent.
- Spot symbols varied in size to mislead.
- Identify rounding or fractional-symbol issues.

Drawing conclusions 4.5.3

- Decide whether a conclusion is supported by the data.
- Watch for overgeneralisation (‘all’, ‘most’).
- Suggest improvements to a misleading chart.

Exam strategy 4.5

- Quote the specific feature that misleads.
- Write a one-sentence improvement.
- Don’t criticise things that aren’t actually misleading.

Crib sheet »

Misleading graphs & drawing valid conclusions in one page

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

Truncated axes

Axis not starting at 0 makes small differences look huge.
Always check where the y-axis begins.

Distorted scales

Unequal intervals on an axis make trends misleading.
Scales should be linear unless clearly labelled otherwise.

Missing data

Categories left out, or a chart not showing the total.
Could change the conclusion entirely.

Pictogram pitfalls

Symbols of different sizes representing the same value.
Missing or unclear key.

Valid conclusions

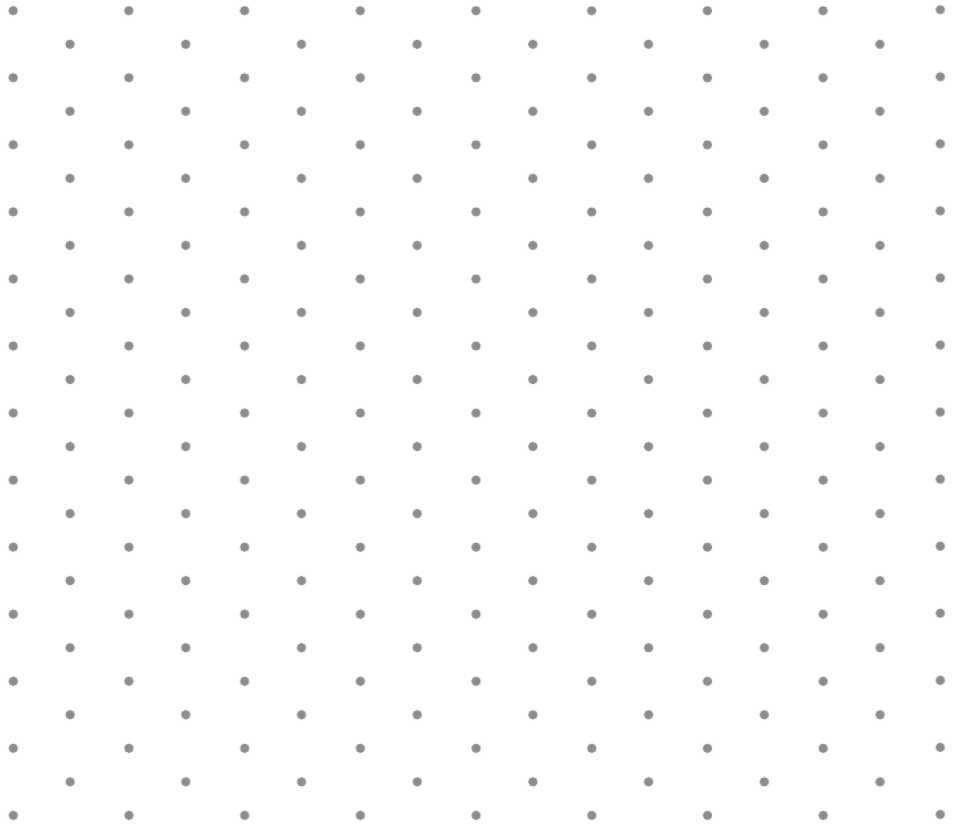
Conclusion should be supported by the data shown.
Watch for 'most', 'all', 'always' — usually too strong.

Critique checklist

- Do axes start at 0?
- Are scales equal?
- Is the sample large enough?
- Are all categories shown?

Examiner only

5. *(a)* Draw an isometric representation of a cuboid measuring 6 cm by 4 cm by 3 cm.
Use the grid below. [2]



(b) Calculate the volume of the cuboid.
Give the units of your answer. [3]

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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]

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(c) There are 50 balls in the bag.
How many of them are blue? [2]

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Examiner only

3. Here are 9 numbers:

27 19 20 32 21 29 20 24 33

(a) Find the mean of these numbers. [3]

(b) Neil says,

"To find the median, you just choose the middle number in the list.
The median of these numbers is 21."

Neil's median is incorrect.
Explain what is wrong with Neil's method. [1]

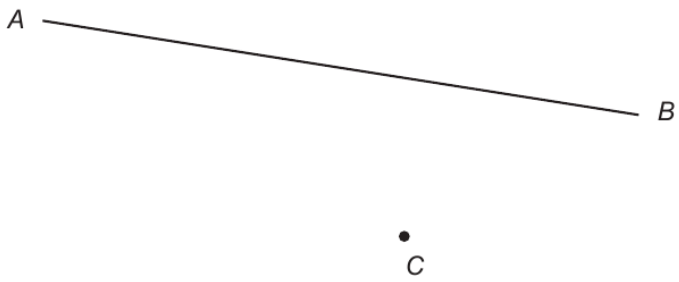
4. *(a)* One of the numbers below is a multiple of 13.
Circle the correct answer. [1]

2226 3213 1628 2843 6110

(b) Find the value of $\frac{30^2 + 20^2}{26}$. [1]

Examiner only

4. A line *AB* is shown below.



(a) Mark the midpoint of *AB* with a ×. [1]

(b) Draw a line parallel to *AB* that passes through point *C*. [1]

5. *(a)* Bethan writes down two square numbers.

She adds her two numbers together.
Her answer is a square number less than 30.

Which two square numbers did Bethan write down? [2]

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Bethan's square numbers are ..... and .....

(b) Harri adds three even numbers together and gets an answer of 23.

Explain how you know that Harri's answer is incorrect. [1]

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Examiner only

1. (a) One of the calculations below is incorrect.
Circle the incorrect calculation. [1]

$78 + 9952 = 10030$ $875 \div 35 = 25$ $3685 - 2852 = 833$

$452 \times 63 = 28466$ $89775 \div 45 = 1995$

(b) One of the numbers below is a multiple of 38.
Circle the multiple of 38. [1]

2 19 338 388 3838

(c) Computers cost £432 each.
How many can be bought with £9876? [1]

Examiner only

3. Complete the calculation below, by finding the **two** missing digits. [1]

5	.....	×	4	7	=	2	4	.....	1

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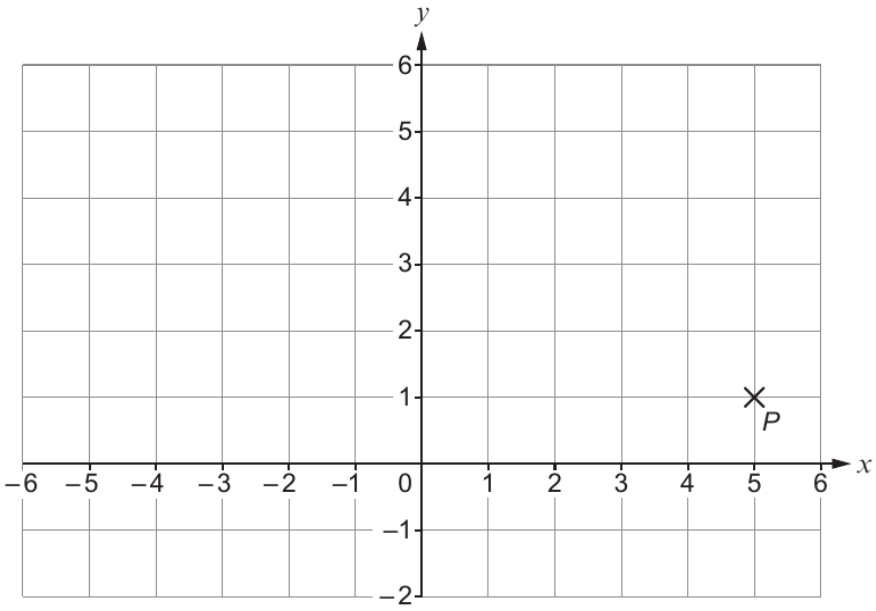
4. The point *P* is plotted on the grid below.



Steve writes the coordinates of *P* as 1; 5.
Explain what is wrong with the way Steve has written the coordinates. [2]

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Examiner only

9. A car passes through four places in the following order: Aber, Berw, Ceiro and Dinas.
The car passes through Aber, Berw and Ceiro at the times shown in the table below.

Place	Time
Aber	13:30
Berw	14:40
Ceiro	16:30
Dinas	

The time taken to travel from Aber to Berw is **twice** the time taken to travel from Ceiro to Dinas.

At what time does the car pass through Dinas?
You must show all your working. [3]

10. Solve the following equations.

(a) $11k = 99$ [1]

Examiner only

9. Solve each of the following equations.

(a) $\frac{x}{5} = 20$ [1]

(b) $7m + 3 = 31$ [2]

10. Evaluate 55% of 42·8. [2]

Examiner only

16. In a game, each competitor will have 20 attempts at throwing a ball into a bucket.
They will get 1 point for every ball that lands in the bucket.

Sioned wants to keep a record of the total points for each competitor.
She decides to show the results in a table with the total points recorded in **groups of equal width**.

(a) She starts to draw a table using five groups, as shown below.

Total points	0 to 3	4 to 7	8 to 11	… to …	… to …
Number of competitors					

Explain why these groups will not be suitable. [1]

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(b) Sioned considers using the table shown below.
She decides that it is suitable for recording all the total points in **groups of equal width**.
Fill in the two missing numbers in the **top** row. [1]

Total points	0 to 6	7 to	..... to 20
Number of competitors			

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Examiner only

(c) Finally, Sioned decides to use the groups shown in the table below.
The results for the first 100 competitors are shown in the table.

Total points	0 to 2	3 to 5	6 to 8	9 to 11	12 to 14	15 to 17	18 to 20
Number of competitors	5	10	17	22	23	12	11

One of these 100 competitors is chosen at random.

(i) What is the probability that this competitor scored 6, 7 or 8 points? [1]

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(ii) Explain why the following statement may be incorrect. [1]

The probability that this competitor scored 19 points is $\frac{11}{100}$.

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Examiner only

8. Use the formula $T = 4A + 8B$ to find the value of T when A = 45 and B = 19. [2]

9. (a) Tomos wants to find the median of the numbers below.

7 1 20 14 11

He writes the answer 20.

Explain why Tomos's answer is incorrect. [1]

(b) Ted writes down five numbers:

59 89 77 31 83

(i) Calculate the mean of Ted's numbers. [3]

(ii) Every number in Ted's list is decreased by 3.
What is the mean of the numbers in his new list? [1]

Examiner only

10. Abby is asked how many quarters there are in 8.

She writes $8 \div 4 = 2$.

Explain why Abby's method is incorrect. [1]

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11. (a) Calculate the size of angle x. [2]

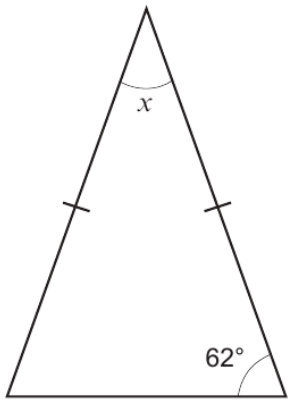

Diagram not drawn to scale

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x = ... °

Examiner only

(b) *PQRS* is a quadrilateral.
QRT is a straight line.
Calculate the size of angle y. [3]

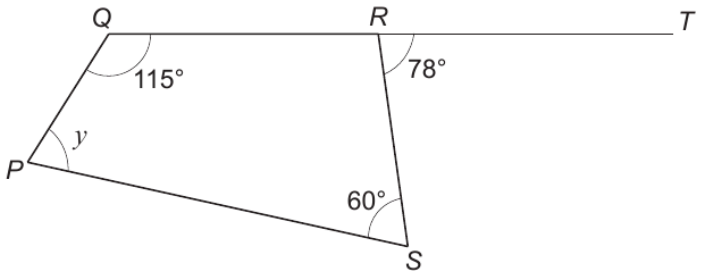

Diagram not drawn to scale

y = ... °