Name	Date started	Target end date

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

Foundation averages from raw lists or ungrouped frequency tables: mean, median, mode and range. Sourced from legacy WJEC GCSE Mathematics-Numeracy Fou

REVISE
.wales

F3.11 — Mean, median, mode & range — lists & ungrouped data

Spec 4.2.8, 4.2.10 — Unit 3 (calculator allowed)

Foundation averages from raw lists or ungrouped frequency tables: mean, median, mode and range. 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: ~2 hours 15 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (90 marks across 35 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).

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Mean, median, mode & range — lists & ungrouped data — what the new spec asks

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

Mean, median, mode 4.4.1

- Calculate each measure from a raw list.
- Calculate from an ungrouped frequency table.
- Choose the most appropriate average for context.

Range 4.4.2

- Find range = max − min.
- Use range to compare spread between two data sets.
- Combine with an average to compare data sets.

From frequency tables 4.4.3

- Use $\Sigma fx \div \Sigma f$ for mean.
- Use cumulative frequency for median position.
- Identify the modal value.

Exam strategy 4.4

- Order data before finding the median.
- Write Σfx and Σf columns for mean.
- Round mean to 1 d.p. unless told otherwise.

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Crib sheet »

Mean, median, mode & range — lists & ungrouped data in one page

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

Mean

$$\text{mean} = \text{total} \div \text{count}$$

Add all the values, divide by how many.

Median

Order the data smallest to largest.

Median = middle value.

Even number of values ⇒ mean of the middle two.

Mode

Most frequent value.

Can be more than one mode (bimodal).
Can be no mode if all unique.

Range

$$\text{range} = \text{largest} - \text{smallest}$$

Measure of *spread*, not average.

From frequency tables

Mean = $\Sigma(x \times f) \div \Sigma f$.

Median position: $(n+1)/2$ from the cumulative frequency.

Mode = x with the highest f.

Choosing an average

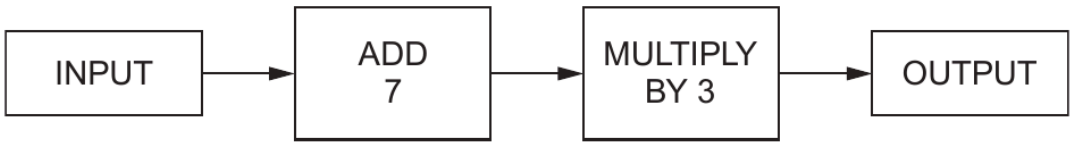
Mean: uses every value (sensitive to outliers).

Median: middle, not affected by outliers.

Mode: only one for categorical data.

Examiner only

4. The diagram below shows a number machine.



Using the number machine, calculate:

(a) the INPUT when the OUTPUT is 36, [1]

.....

.....

(b) the OUTPUT when the INPUT is n. [2]

.....

.....

3300U401 05

5. Write down three integers, all less than 25, whose
- range is 8, and
- mean is 13. [2]

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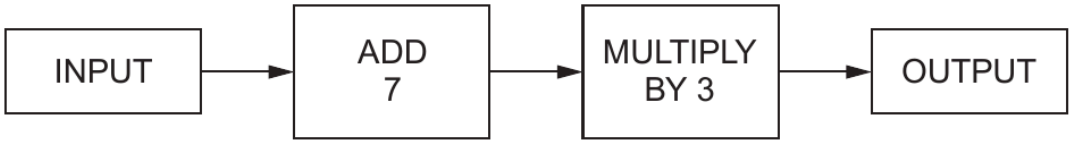
The three integers are ..... , ... and .....

Examiner only

15. The diagram below shows a number machine.



Using the number machine, calculate:

(a) the OUTPUT when the INPUT is −2, [1]

.....

.....

(b) the INPUT when the OUTPUT is 36, [1]

.....

.....

16. Write down three integers, all less than 25, whose
- range is 8, and
- mean is 13. [2]

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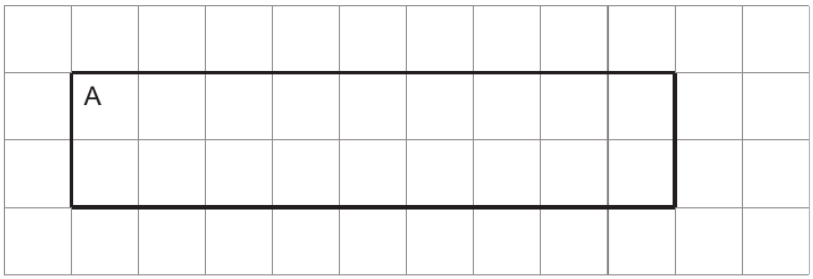
The three integers are ..... , ... and .....

Examiner only

4. *(a)* Rectangle A is drawn on the centimetre square grid below.



(i) What is the perimeter of rectangle A? [1]

.....

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Perimeter = ...

(ii) What is the area of rectangle A?
Give the units of your answer. [2]

.....

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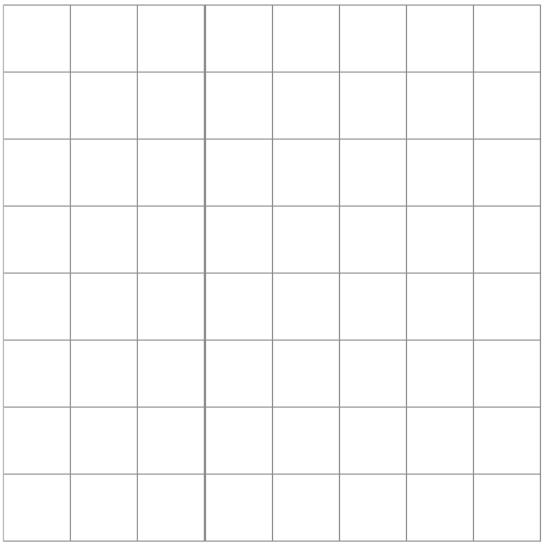
Area = ...

Examiner only

(b) Rectangle B has the same area as rectangle A and fits on the centimetre square grid below.
Rectangle B has a different perimeter from rectangle A.

Draw rectangle B on the grid below. [1]



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

12. Look at the following set of four numbers.

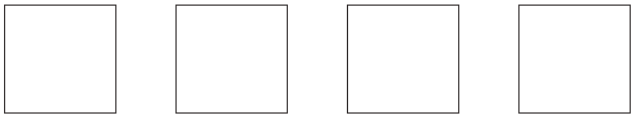
5 8 10 13

Find another set of four numbers so that:

- the range has increased by 2,
- the mean remains the same,
- the median has decreased by 1.

You may use some of the numbers from the original set, but **not** exactly the same four numbers. [3]

My four numbers are



Examiner only

4. The mean of two numbers is 7.
The range of these two numbers is 8.

What are these two numbers? [2]

The numbers are ☐ and ☐

5.

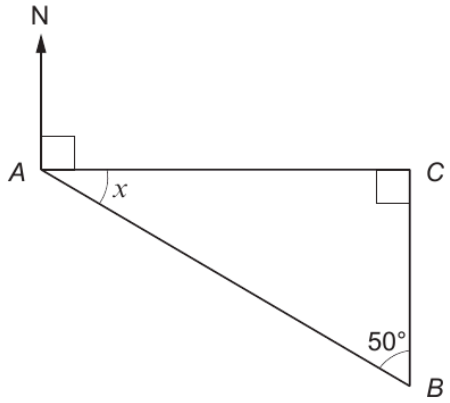


Diagram not drawn to scale

Calculate the size of angle x.
Hence, give the bearing of point B from point A. [3]

x = ... ° Bearing of point B from point A = ... °

Examiner only

10. *(a)* Fatima writes down three **square** numbers.
The total of the square numbers is 30.

Which square numbers did Fatima write down? [3]

The numbers which Fatima wrote are ..... , ... and .....

(b) Cadfan writes down four **positive odd** numbers.

The mode of his numbers is 7.
The median of his numbers is 6.

Which odd numbers could Cadfan have written down? [3]

The numbers Cadfan could have written are ..... , ... , ... and .....

Examiner only

14. The mean of two numbers is 7.
The range of these two numbers is 8.

What are these two numbers? [2]

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The numbers are ☐ and ☐

15.

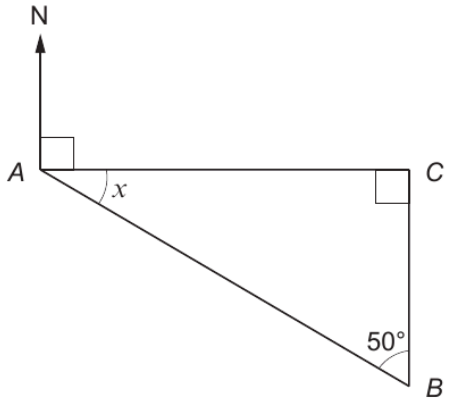

Diagram not drawn to scale

Calculate the size of angle x.
Hence, give the bearing of point B from point A. [3]

.....

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x = ... ° Bearing of point B from point A = ... °

Examiner only

5. In this question, you must complete the boxes using **only** the digits 0, 1 and 2.
In each part, you must use **all three** of the digits.

(a) Write the size of an angle which is an obtuse angle. [1]

			°

(b) Write the size of an angle which is a reflex angle. [1]

			°

6. Kate writes down three **different even** numbers.

The mean of Kate's numbers is 8.
She did **not** write down the number 8.

What possible even numbers could Kate have written down? [3]

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Possible numbers Kate could have written are ..... , ... and .....

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

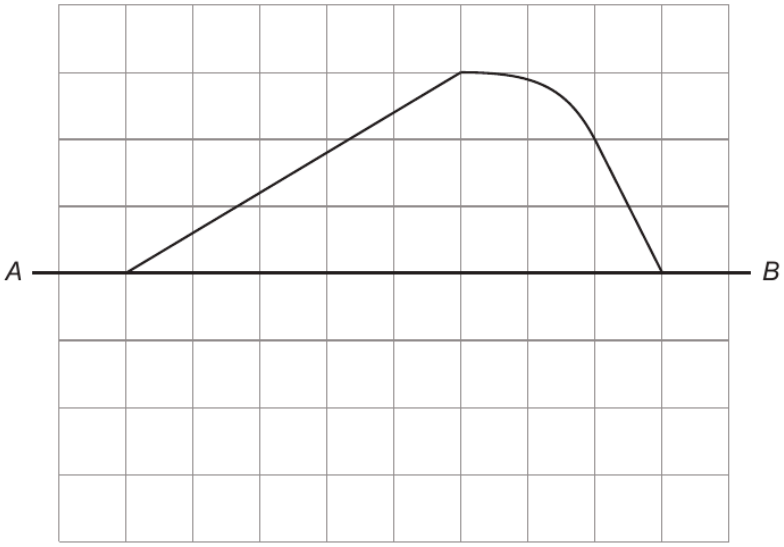
(b) Write 75% as a fraction in its lowest terms. [1]

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

28 31 28 29 31 28 34 24 32

Mode is .....

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



Examiner only

6. *(a)* Write the next term in the sequence below. [1]

2, 26, 50, 74, ...

(b) Describe the rule for continuing the following sequence. [1]

77, 64, 51, 38, 25, ...

Rule:

.....

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(c) A dog is x years old.
Another dog is 2 years younger.
Write down, in terms of x, the age of the younger dog. [1]

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7. Gwenan writes down four numbers:

64 89 83 26

(a) Calculate the mean of Gwenan's numbers. [3]

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(b) Every number in Gwenan's list is increased by 1.
What is the mean of her new list of numbers? [1]

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Examiner only

16. *AB* and *CD* are parallel.

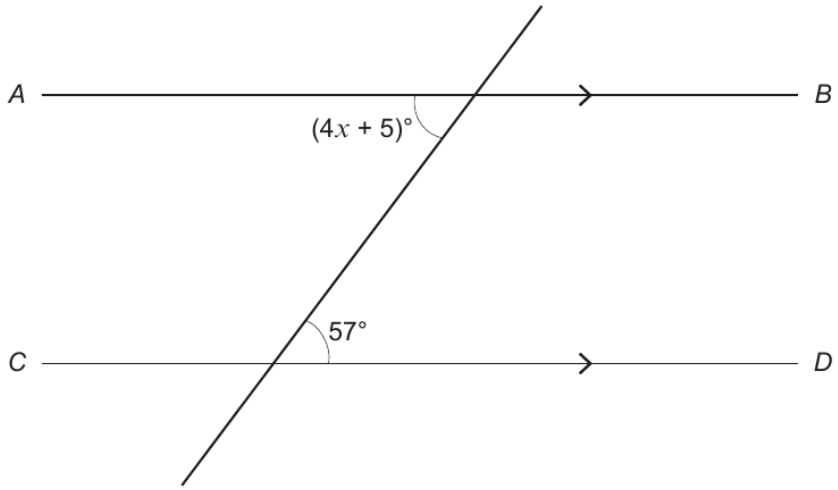

Diagram not drawn to scale

Calculate the value of x. [3]

17. Write down four positive whole numbers in the boxes below so that:

- the range of the numbers is 6,
- the mean of the numbers is 5,
- the median of the numbers is 4. [3]

Examiner only

9. Write down four whole numbers so that:

- they are all between 1 and 15 inclusive
- they have a mode of 7
- they have a median value of 8·5
- their mean is 9.

Write your numbers in the boxes below. [3]

Examiner only

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

A customer buys 7 identical small boxes and 3 identical large boxes from a shop.
The total cost of these boxes is £59.
Each small box costs £5.

How much does each large box cost?
You must show all your working. [3 + 2 OCW]

Examiner only

5. (a) Last year, Viktor's total income before tax was 28 000 euros.

The tax bands, taxable income and tax rates for last year were as follows:

Band	Taxable income	Tax rate
Personal allowance	Up to 10 000 euros	0%
Basic rate	10 000 euros to 25 000 euros	22%
Higher rate	Over 25 000 euros	35%

Viktor has already paid 3600 euros towards his income tax bill for last year.
Calculate how much income tax Viktor still owes.
You must show all your working. [7]

(b) When Viktor paid 3600 euros towards his bill, the exchange rate was £1 = 1.11 euros.
How much was 3600 euros in pounds?
Give your answer correct to the nearest penny. [2]

£ .....

Examiner only

8. There are five numbers in a list.
The mean of the five numbers is 7.
Another number is added to the list.
The mean of these six numbers is 8·5.

Find the value of the sixth number.
You must show all your working. [3]

9. *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 1 : 8.
The **larger** share is £16.80.
What is the total amount of money shared?
You must show all your working. [3 + 2 OCW]

Examiner only

18. There are five numbers in a list.
The mean of the five numbers is 7.
Another number is added to the list.
The mean of these six numbers is 8·5.

Find the value of the sixth number.
You must show all your working. [3]

19. A sum of money is shared in the ratio 1 : 8.
The **larger** share is £16.80.
What is the total amount of money shared?
You must show all your working. [3]

Examiner only

4. (a) Which of the following is nearest in mass to 5 kg?
Circle the correct answer. [1]

7 lb 11 lb 15 lb 19 lb 23 lb

(b) Which of the following is nearest in volume to 100 litres?
Circle the correct answer. [1]

100 pints 125 pints 150 pints 175 pints 200 pints

5. Rhian is n years old.
Samir is 7 years younger than Rhian.
Nigel is twice as old as Samir.

Write down an expression, in terms of n, for Nigel's age. [3]

Nigel's age .....

Examiner only

5. Find the median of the numbers listed below. [2]

22 13 29 20 17 15 11

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6. In the table below, the letters a, b, c and d represent different numbers.
The total for each row is given at the side of the table.
Find the values of a, b, c and d. [4]

a	a	a	a	120
b	a	a	a	107
b	b	c	c	114
a	b	c	d	100

a = ...

b = ...

c = ...

d = ...

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Examiner only

15. Rhian is n years old.
Samir is 7 years younger than Rhian.
Nigel is twice as old as Samir.

Write down an expression, in terms of n, for Nigel's age. [3]

.....

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.....

Nigel's age .....

16. The mean of four numbers is 7.

(a) What is the total of the four numbers? [1]

.....

.....

(b) Find a set of four numbers such that:

- their mean is 7
- their range is 6.

Write your four numbers in the boxes below. [2]

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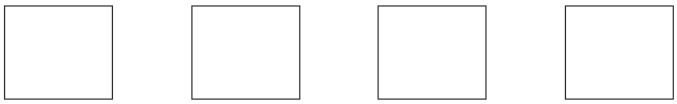

Examiner only

5. (a) The mean of four numbers is 9.
What is the total of the four numbers? [1]

.....

.....

(b) Find a set of four numbers such that:
- their mean is 9
- their mode is 11.

Write your four numbers in the boxes below. [2]

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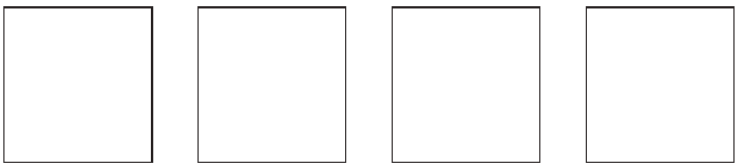

Examiner only

5. (a) Arwel writes a list of six numbers:

3 3 4 4 5 6

Arwel adds another number to his list.
The mode of his seven numbers is an **odd** number.
What number does Arwel add to his list? [1]

.....

.....

The number that Arwel adds to his list is .....

(b) Ffion writes a list of seven numbers:

3 8 4 1 2 8 9

What is the median of Ffion's seven numbers? [2]

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.....

The median of Ffion's seven numbers is .....

(c) Marc writes down two numbers:

2 7

Marc adds another number to his list.
The mean of his three numbers is 5.

What number does Marc add to his list?
You must show all your working. [3]

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The number that Marc adds to his list is .....

Examiner only

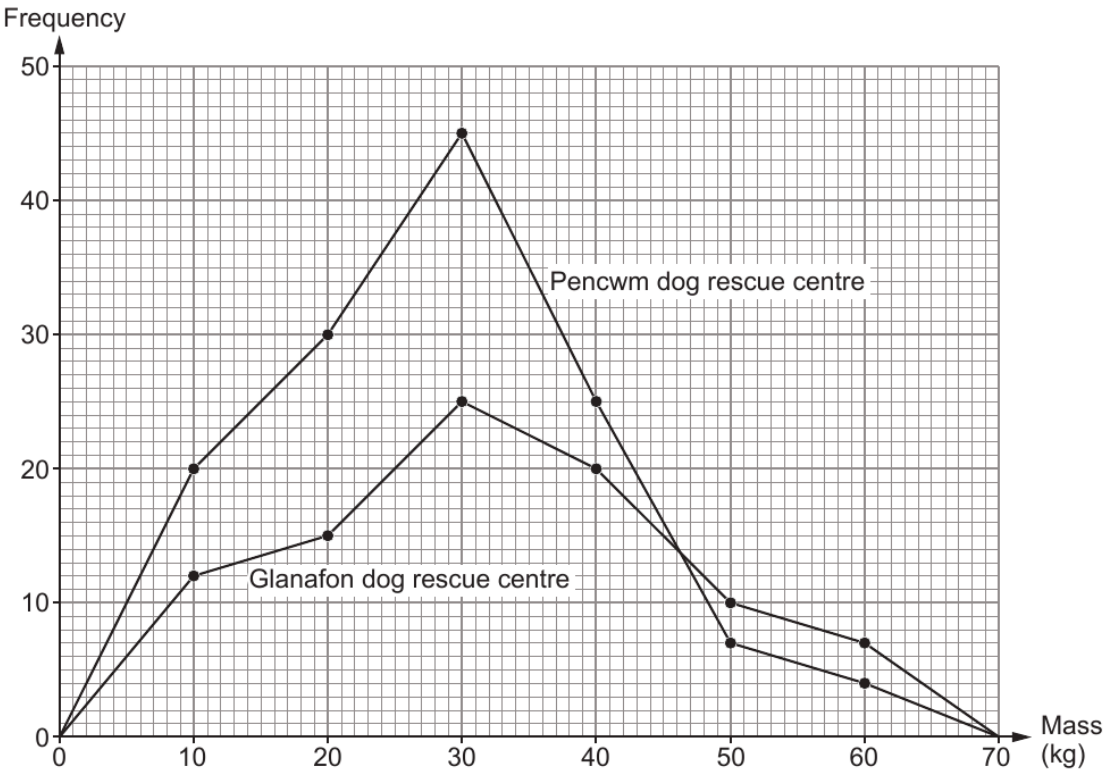
6. Glanafon and Pencwm dog rescue centres take in unwanted dogs.

The mass of each dog in the two dog rescue centres was recorded.

Groups of width 10 kg were used:

$5\,\text{kg} \leqslant \text{mass} < 15\,\text{kg}, \quad 15\,\text{kg} \leqslant \text{mass} < 25\,\text{kg}, \quad \ldots, \quad 55\,\text{kg} \leqslant \text{mass} < 65\,\text{kg}$

The results are shown in the frequency polygons below.



(a) Doreen, Rory and Muzhir look at these frequency polygons.

(i) Doreen says,

"The modal group of the masses of dogs in each dog rescue centre is the same."

Is Doreen correct?

Yes ☐ No ☐ Can't tell ☐

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

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Examiner only

(ii) Rory says,

"28 of the dogs in Pencwm each have a mass of 18 kg."

Is Rory correct?

Yes ☐ No ☐ Can't tell ☐

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

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(iii) Muzhir says,

"There is a higher proportion of dogs that are heavier than 35 kg in Glanafon than in Pencwm."

Without doing any calculations, decide if Muzhir is correct.

Correct ☐ Incorrect ☐ Can't tell ☐

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

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(b) The estimate of the mean mass of the dogs in Glanafon was 32·5 kg.
How much less was the estimate of the mean mass of the dogs in Pencwm?
You must show all your working. [5]

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Estimate of the mean mass of the dogs in Pencwm is ..... kg less than in Glanafon.

Examiner only

7. A report from a Saturday newspaper is shown below.

> **Mean rainfall for the last 5 days is 42 mm**
>
> Mid Wales had significant rainfall over the last 5 days.
> 40 mm of rain fell on Monday, 37 mm on Tuesday and 39 mm on Wednesday.
> Thursday was the wettest day, when 48 mm of rain fell.
> Rain fell again on Friday.
> The mean rainfall per day for these 5 days was 42 mm.

(a) Calculate the rainfall for Friday.
You must show all your working. [3]

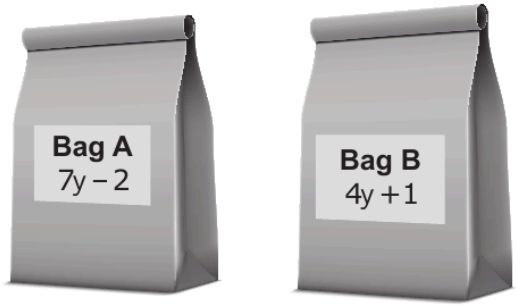
Rainfall on Friday was ..... mm

(b) It did not rain on Saturday or Sunday in this week.
Calculate the mean rainfall per day for the week. [2]

Mean rainfall per day for the week is ..... mm

Examiner only

8. There are $7y-2$ counters in Bag A.
There are $4y+1$ counters in Bag B.



9 counters are added to Bag B.
There are now the same number of counters in each bag.

Form an equation in terms of y.
Solve the equation to find the value of y.
You must show all your working. [4]

9. A cup contains some tea.

Elsie drinks $\frac{5}{7}$ of the tea.

There are 44 ml of tea left in the cup.
How much tea was in the cup before Elsie drank any? [2]

Examiner only

9. A car was bought in 1973 for £2500.

In the first year, this car depreciated by 23% of its value.
In each of the following 39 years, it depreciated by 4% of its value the previous year.

The car then started to increase in value.
In each of the next 10 years, it increased by 14% of its value the previous year.

Calculate the value of the car after these 50 years.
You must show all your working. [4]

The value of the car after 50 years is £ .....

END OF PAPER

Examiner only

15. (a) The mean of four numbers is 9.
What is the total of the four numbers? [1]

(b) Find a set of four numbers such that:
- their mean is 9
- their mode is 11.

Write your four numbers in the boxes below. [2]

Examiner only

7. (a) Jemma is asked to work out the following calculation.

$$10 + 4 \times 9$$

Jemma's method is

14 × 9 = 126

Explain why Jemma's method is wrong. [1]

(b) Sion is asked to answer the following question.

How many halves are there in 20?

Sion's method is

20 ÷ 2 = 10

Explain why Sion's method is wrong. [1]

(c) Rebecca is asked to find the range of the numbers below.

7 1 20 14 11

Rebecca's method is

11 − 7 = 4

Explain why Rebecca's method is wrong. [1]

Examiner only

(d) Stef knows what $\frac{1}{5}$ of Paulo's number is.

Using this information, **explain** how Stef can work out $\frac{1}{10}$ of Paulo's number. [1]

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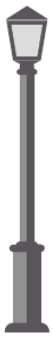
Examiner only

7. (a)

Remember:

1 kilowatt (kW) = 1000 watts (W)



There are 8 street lights in Ffordd Alwyn.
Each light is fitted with an 80 watt light bulb.

Each of the 8 street lights is usually on from 6 p.m. to 6 a.m.

It costs 32.4p per hour for each **kilowatt** of electricity used.

How much would be saved **per week** if the 8 street lights were only on from 7 p.m. to 5 a.m.?
Give your answer in pounds, correct to the nearest penny.
You must show all your working. [5]

Examiner only

(b) A lamp post is vertical and stands on horizontal ground.
The angle of elevation of the top of the lamp post is 68° when measured from a point 3·3 m from the centre of the base of the lamp post.

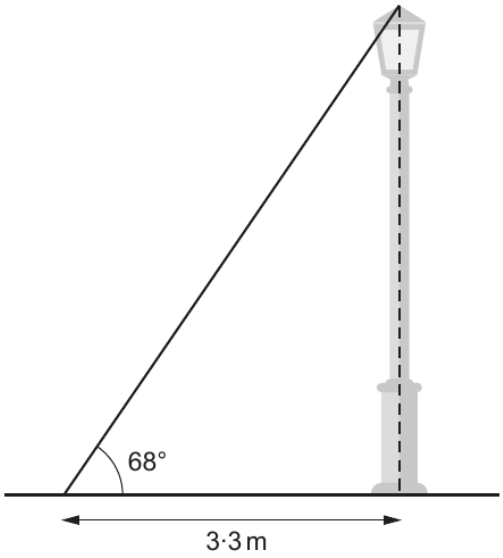
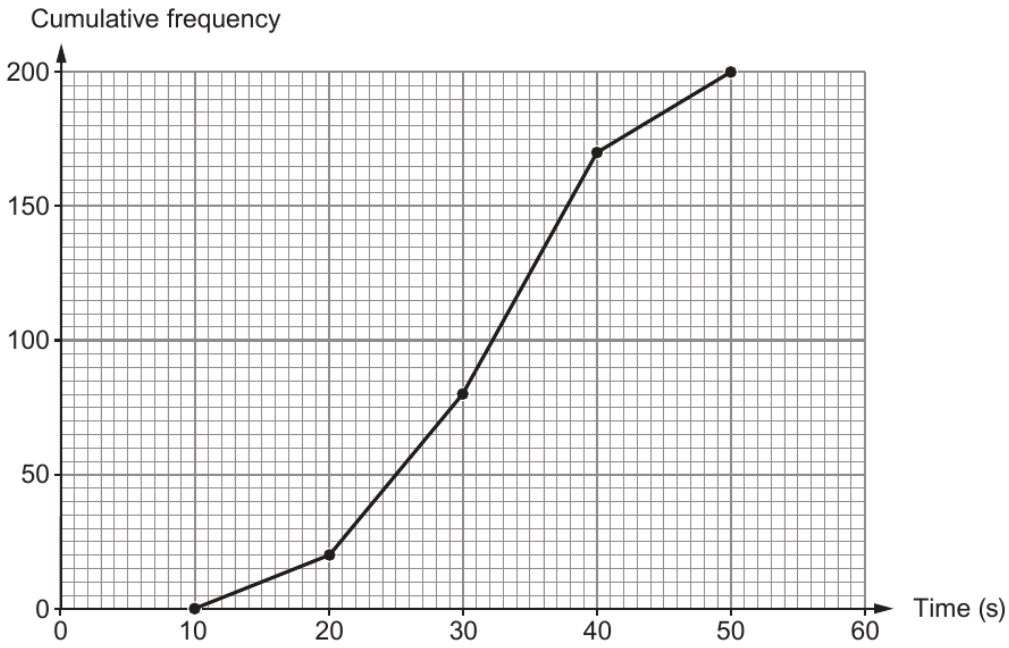


Diagram not drawn to scale

Calculate the height of the lamp post. [3]

Examiner only

8. (a) On 1st June last year, 200 customers used cash to pay at Shop Lil.
The cumulative frequency diagram represents the time each of these 200 customers waited to be given change at the checkout.



(i) How many of these customers waited between 30 and 50 seconds for their change? [2]

.....

.....

(ii) Use the graph to estimate the median time these 200 customers waited for their change.
Circle your answer. [1]

24 seconds 32 seconds 38 seconds 80 seconds 100 seconds

(iii) Calculate the fraction of these 200 customers who waited 40 seconds or longer for their change.
Give your answer in its simplest form. [2]

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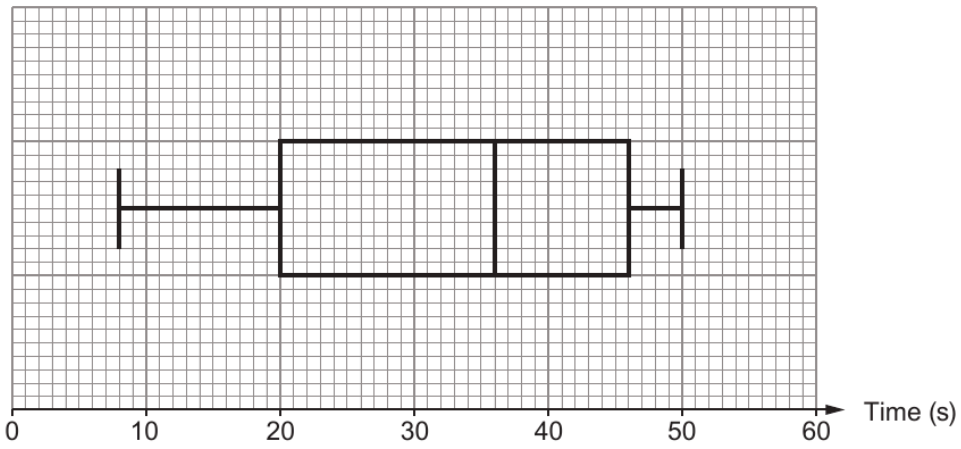
Examiner only

(b) On 1st June this year, the manager at Shop Lil drew a box-and-whisker plot of the times 200 customers waited for their change at the checkout.



Based on the results of these 200 customers, the manager made the following statements. Complete the statements.

(i) "On 1st June this year, 50% of our customers were given their change in ..... seconds or less." [1]

(ii) "On 1st June this year, the interquartile range of the times taken to give customers their change was ..... seconds." [2]

.....

.....

(c) Consider the 50 customers waiting the **longest** times to get their change on 1st June last year and this year.
Has the speed of giving change at the checkout improved since last year?

Yes ☐ No ☐

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

.....

.....

.....

.....

Examiner only

17. Factorise $x^2 + 3x - 40$, and hence solve $x^2 + 3x - 40 = 0$. [3]

18. a and b are two numbers, where $b > a$.

The mean of the two numbers is equal to the range of the two numbers.

Show that $3a = b$. [3]

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

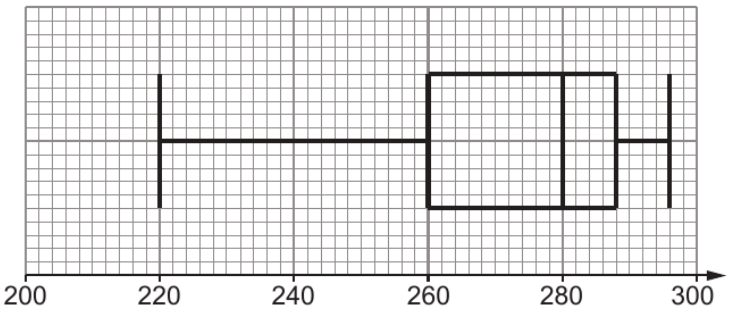
(i) Calculate the mean of Ted's numbers. [3]

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

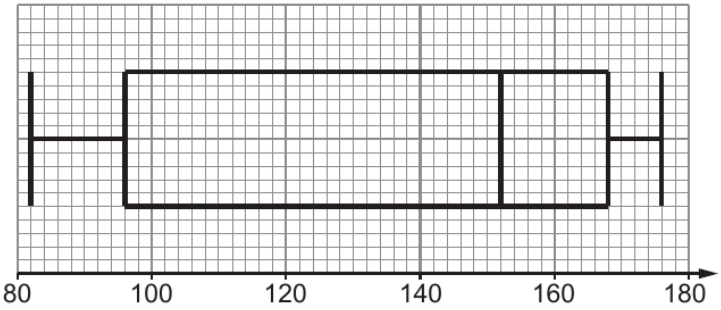
11. Geraint has collected data on some adult gulls.
He weighed 400 slender-billed gulls, 400 little gulls, and 400 black-headed gulls.

He has constructed box-and-whisker diagrams to display the masses of the gulls.

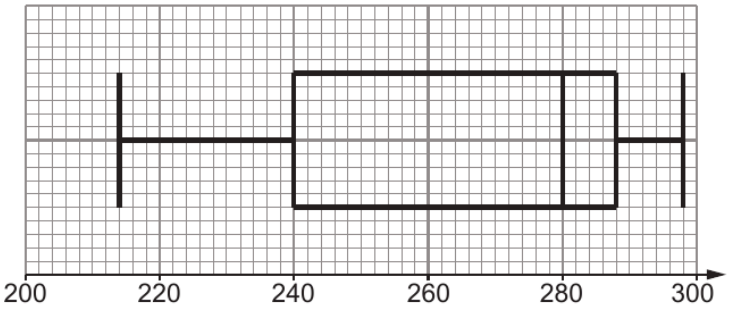
Slender-billed gulls



Little gulls



Black-headed gulls



Examiner only

(a) What is the range of the masses of the slender-billed gulls? [1]

.....

Range of the masses ..... g

(b) How many of the little gulls have a mass greater than or equal to 96 g? [2]

.....

.....

.....

(c) Write down the percentage of little gulls that have a mass greater than or equal to 168 g. [1]

..... %

(d) From the box-and-whisker diagrams, Geraint notices that two of the types of gull have the same median mass.
He makes the following statement about these two types of gull.

"The diagrams suggest that one of these two types of gull generally has a greater mass than the other."

(i) Which type of gull appears to have the greater mass? [1]

.....

(ii) Geraint based his statement on **one** of the following measures.
Which measure did Geraint use?
Circle your answer. [1]

Range Median Lowest mass Lower quartile Upper quartile

Examiner only

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]

END OF PAPER

Examiner only

12. Find five numbers so that:

- their mean is 4·5
- their mode is 3·5.

Write your five numbers in the boxes below. [3]

The five numbers are

13. The interior angle of a regular polygon is 171°.

How many sides does the polygon have? [3]