Name	Date started	Target end date

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

Foundation Unit 3 calculator work: rounding to nearest 10/100/1000 and to significant figures, then real-world calculations mixing fractions, decimals

REVISE
.wales

F3.01 — Number, rounding & multipliers in context

Spec 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.4.8, 1.4.9, 1.6.1 — Unit 3 (calculator allowed)

Foundation Unit 3 calculator work: rounding to nearest 10/100/1000 and to significant figures, then real-world calculations mixing fractions, decimals and percentages. 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 40 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (107 marks across 59 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).

Number, rounding & multipliers in context — what the new spec asks

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

Rounding 1.1.1

- Round to nearest 10, 100, 1000.
- Round to a given number of decimal places.
- Round to a given number of significant figures.

Calculator fluency 1.1.2

- Use brackets and the fraction key correctly.
- Convert between fractions, decimals and percentages.
- Use the $\times 10^{x}$ key for standard-form style inputs.

Real-world calculations 1.4.8

- Set up a calculation from a worded context.
- Decide whether to round and to how many figures.
- Check the answer is sensible in context.

Exam strategy 1.6.1

- Write down calculator key presses or interim values for method marks.
- Don't round mid-calculation — only at the end.
- State units in the final answer.

Crib sheet »

Number, rounding & multipliers in context in one page

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

Rounding to nearest 10/100/1000

Look at the digit *after* the place you're rounding to.

5 or above ⇒ round up. Below 5 ⇒ round down.

3 274 to the nearest 100 = 3 300.

Significant figures

First sig fig is the first non-zero digit, left to right.

0.00408 to 2 s.f. = 0.0041.

Keep place value with zeros if needed: 4 273 to 1 s.f. = 4 000.

Decimal places

Count digits *after* the decimal point.

3.1476 to 2 d.p. = 3.15 (digit after is 7, so round up).

Fraction ↔ decimal ↔ percent

$$\text{divide top by bottom} \Rightarrow \text{decimal} \times 100 \Rightarrow \%$$

¾ = 0.75 = 75%. 0.4 = 40% = 2/5.

Multipliers in context

+15% ⇒ × 1.15. −20% ⇒ × 0.80.

Chain them: +10% then −10% is × 1.10 × 0.90 = × 0.99 (not 1).

Common traps

- Rounding the rounded answer twice.
- Forgetting trailing zeros: 4 273 to 1 s.f. is 4 000, not 4.
- Treating % off and % on as inverses (they aren't).

Examiner only

7. *(a)* Solve these equations.

(i) $7x = 56$ [1]

(ii) $y + 19 = 83$ [1]

(b) Simplify the expression $12k - 15k + 7k$. [1]

8. *(a)* Write down the value of 9^2. [1]

(b) Work out $1{\cdot}2 \times 70$. [1]

Examiner only

14. A **whole** number is written on a card.

You are given three clues to help you work out the number on the card.

Clue 1 : **Double** the number is between 8 and 18 inclusive.

Clue 2 : The number is a prime number.

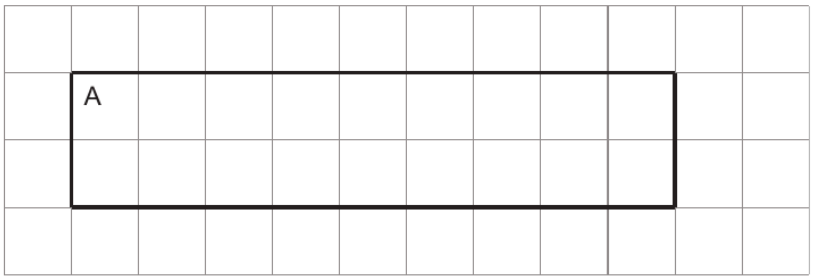
Clue 3 : The number is **not** a factor of 100.

What is the number on the card?
You must show all your working. [3]

The number on the card is .....

Examiner only

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



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

.....

.....

Perimeter = ...

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

.....

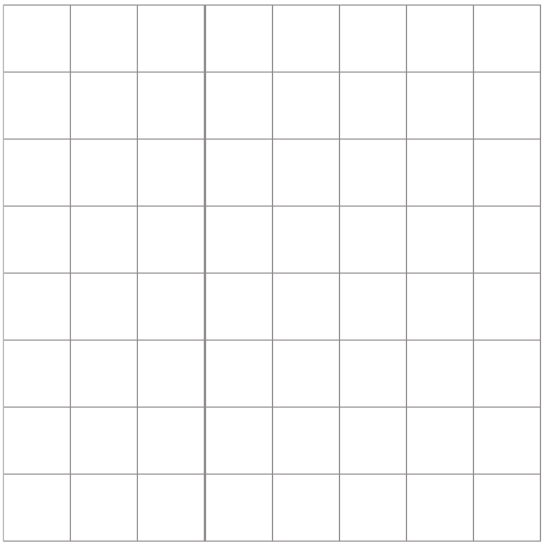
.....

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]



3300U101
07

Examiner only

20. A box contains many discs, identical in shape and size.
A picture of one of four Welsh castles is printed on each disc.

(a) A disc is chosen at random from the box.
Complete the table below to find the probability of choosing a disc showing Dinefwr Castle. [2]

Picture	Caernarfon Castle	Harlech Castle	Rhuddlan Castle	Dinefwr Castle
Probability	0·36	0·12	0·24	

.....

.....

.....

.....

(b) In the box, there were 522 discs showing a picture of Caernarfon Castle.
How many of the discs showed a picture of Harlech Castle? [2]

.....

.....

.....

.....

END OF PAPER

Examiner only

2. *(a)* Write thirteen point two five in figures. [1]

.....

(b) Write the number 60 043 in words. [1]

.....

(c) Here are four digits:

8 5 3 7

(i) Use each of these digits once and once only.
What is the **largest** number that can be made? [1]

(ii) Use **three** of these digits once and once only.
What is the **smallest even** number that can be made? [1]

Examiner only

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

A journey takes 2 hours 35 minutes.
The journey finishes at 7 p.m.

At what time did it begin?
Write your answer in 24-hour clock time.
You must show all your working. [3 + 2 OCW]

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.....

7. *(a)* Write 312 cm in metres. [1]

.....

312 cm = ... m

(b) Write 9·07 km in metres. [1]

.....

9·07 km = ... m

Examiner only

8. *(a)* Mark has some cards. Each card has a number written on it.
These are Mark's cards.
The number on the last card is missing.

3	4	3	5	4	7	3	4	

Write a number on the last card so that the mode of these numbers is an odd number. [1]

.....

.....

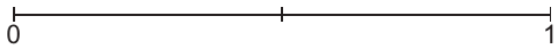
(b) Jane has a different set of cards.
These are Jane's cards.

2	2	4	7	9	15	15	21

Jane chooses a card at random from her set of cards.
On the probability scale below, mark the points A and B where:

(i) A is the probability of Jane choosing a number less than 10, [1]

(ii) B is the probability of Jane choosing the number 15. [1]



Examiner only

5. *(a)* Write 481·627 correct to 2 decimal places. [1]

.....

(b) Write down the value of 8^2. [1]

.....

(c) Write down the value of $\sqrt{49}$. [1]

.....

(d) Work out 38·25 ÷ 1000. [1]

.....

Examiner only

5. In this question, you must use only the numbers 3 and 7 to make other numbers.
You must only add or subtract.

For example, if we wanted an answer of 11, we could write

$$7 + 7 - 3 = 11.$$

Show how you can get each of the following answers.

(a) 2 [1]

Write your solution in the box below.

= 2

(b) 8 [1]

Write your solution in the box below.

= 8

(c) 19 [1]

Write your solution in the box below.

= 19

Examiner only

10. Twenty-five balls have numbers printed on them.
Some of the balls are coloured yellow (Y), the others are coloured blue (B).
The list below shows both the colour of each ball and the number printed on it.

Y 76	Y 217	B 54	B 126	Y 21
Y 438	Y 32	B 561	B 194	Y 69
B 37	B 518	Y 94	Y 157	Y 208
Y 382	B 56	B 234	Y 72	B 84
Y 68	Y 271	Y 53	B 100	Y 321

(a) Complete the frequency table. [2]

Type of ball	Yellow		Blue	
	Number < 100	Number $\geqslant 100$	Number < 100	Number $\geqslant 100$
Frequency	8			

(b) How can you use your table to check that all the balls have been counted? [1]

(c) The 25 balls are placed in a box.
One ball is chosen at random.
What is the probability that it is a yellow ball numbered less than 100? [2]

Examiner only

16. *ABCD* is a rectangle.
AB is parallel to *EF*.
AC, *CE* and *DG* are straight lines.

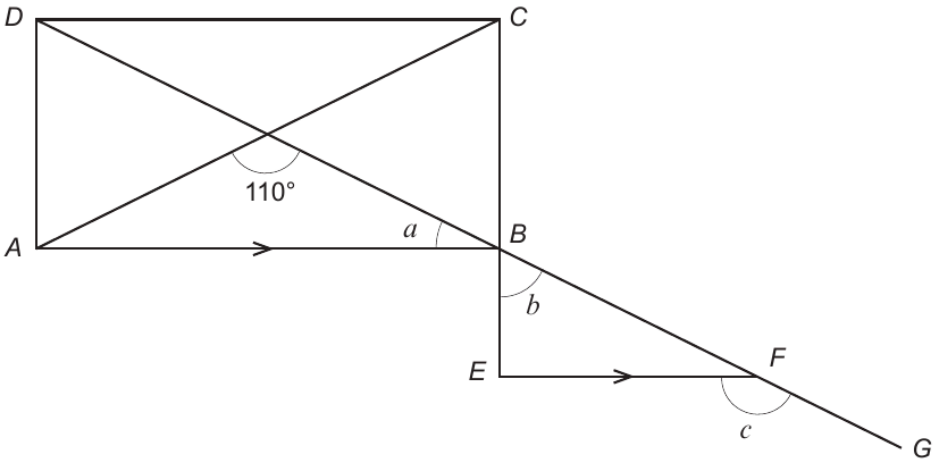


Diagram not drawn to scale

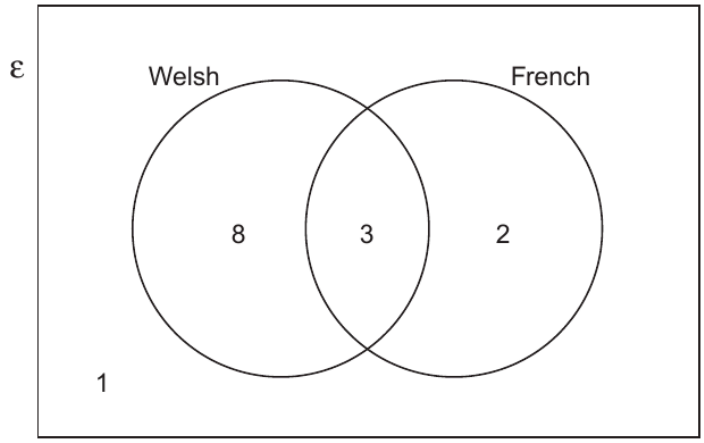
Find the size of each of the angles a, b and c. [4]

a = ... ° b = ... ° c = ... °

Examiner only

6. A group of pupils is asked whether they can speak Welsh, French, both languages, or neither language.

Their answers are shown in the Venn diagram below.
The universal set, ε, contains all the pupils in the group.



(a) How many of the pupils cannot speak French? [1]

.....

(b) One pupil from the group is chosen at random.
What is the probability that this pupil can speak both Welsh and French? [2]

.....

.....

.....

Examiner only

7. *(a)* Solve these equations.

(i) $7x = 56$ [1]

(ii) $23 - x = 9$ [1]

(b) (i) Sian has n boxes.
Each box contains 8 pens.
How many pens does Sian have altogether? [1]

Number of pens is .....

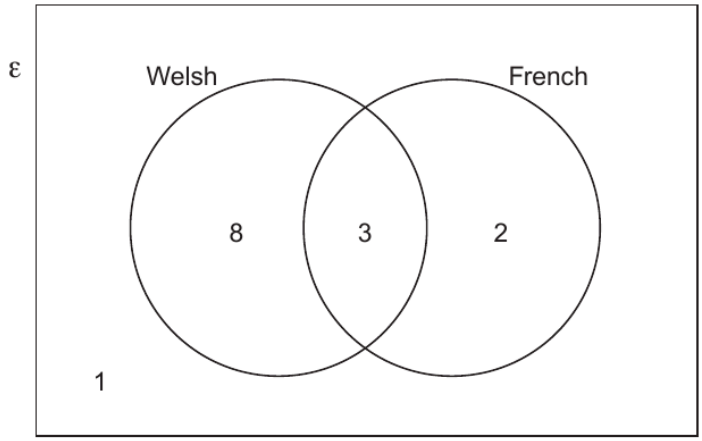
(ii) Meic had m CDs.
He gave 3 CDs to a friend.
How many CDs does Meic have now? [1]

Number of CDs is .....

Examiner only

16. A group of pupils is asked whether they can speak Welsh, French, both languages, or neither language.

Their answers are shown in the Venn diagram below.
The universal set, ε, contains all the pupils in the group.



(a) How many of the pupils cannot speak French? [1]

.....

(b) One pupil from the group is chosen at random.
What is the probability that this pupil can speak both Welsh and French? [2]

.....

.....

.....

Examiner only

20. A cuboid has dimensions of 40 mm, 25 mm and 12 mm.
All of these measurements are correct to the nearest mm.

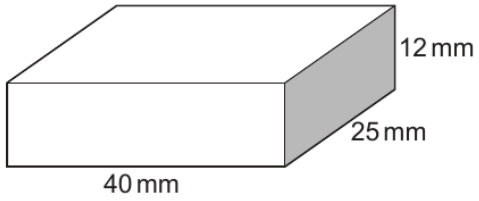


Diagram not drawn to scale

Four of these cuboids are stacked together as shown below.

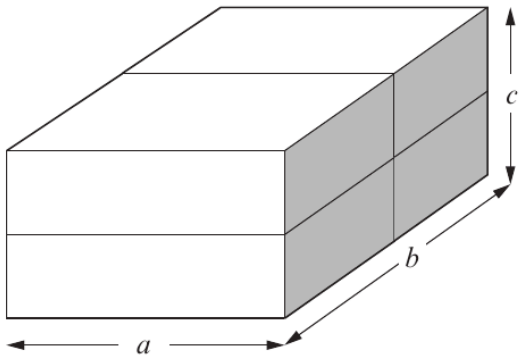


Diagram not drawn to scale

(a) Write down the **greatest** possible value of length a.
Give your answer in mm. [1]

.....

(b) Calculate the **greatest** possible value of length b.
Give your answer in mm. [1]

.....

.....

.....

(c) Calculate the **least** possible value of length c.
Give your answer in mm. [1]

.....

.....

.....

END OF PAPER

Examiner only

2. *(a)* Add 4571 and 862. [1]

(b) Subtract 643 from 817. [1]

(c) Calculate one quarter of 300. [1]

(d) Gwilym thinks of a number.
When he divides his number by 7, he gets an answer of 6.

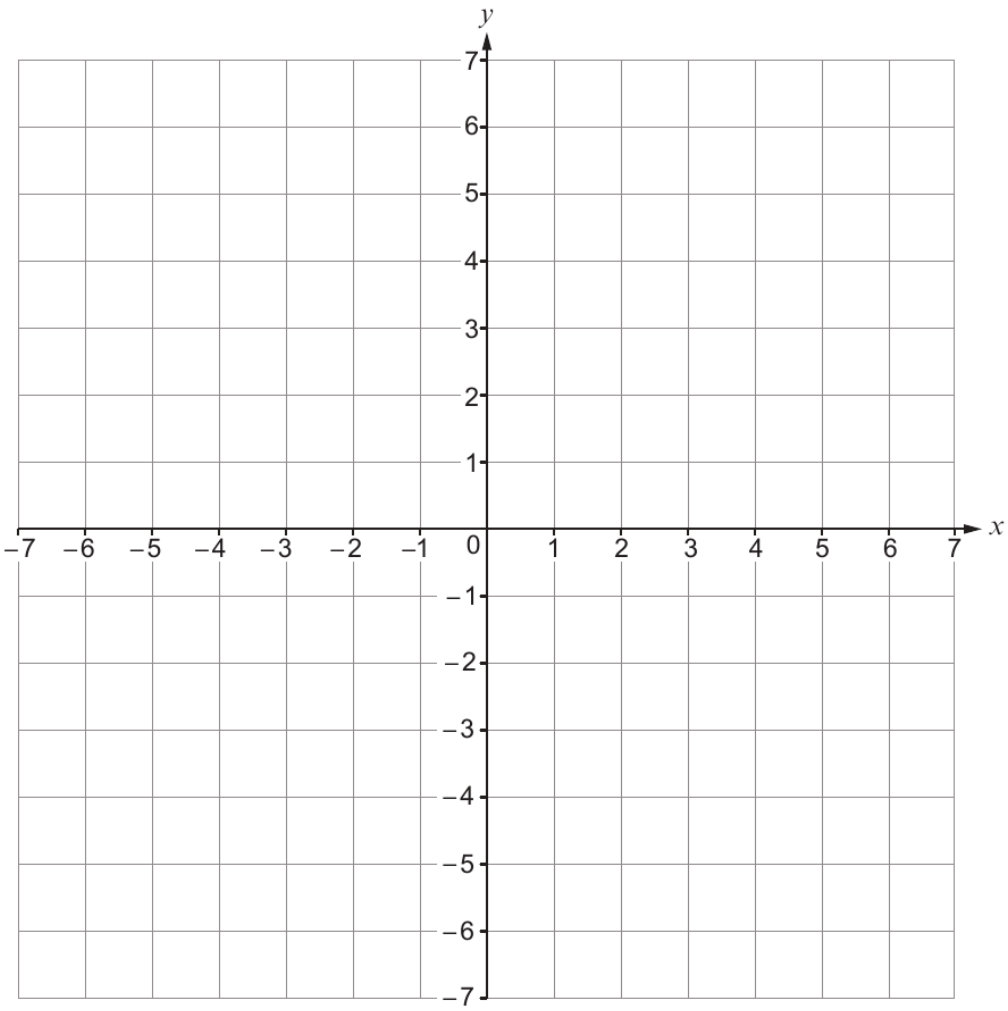
When he divides his number by 2, what should his answer be? [2]

3. *(a)* Write 637 correct to the nearest 100. [1]

(b) Write 3892 correct to the nearest thousand. [1]

Examiner only

2. *(a)* Draw the line $x = -4$ on the grid below. [1]

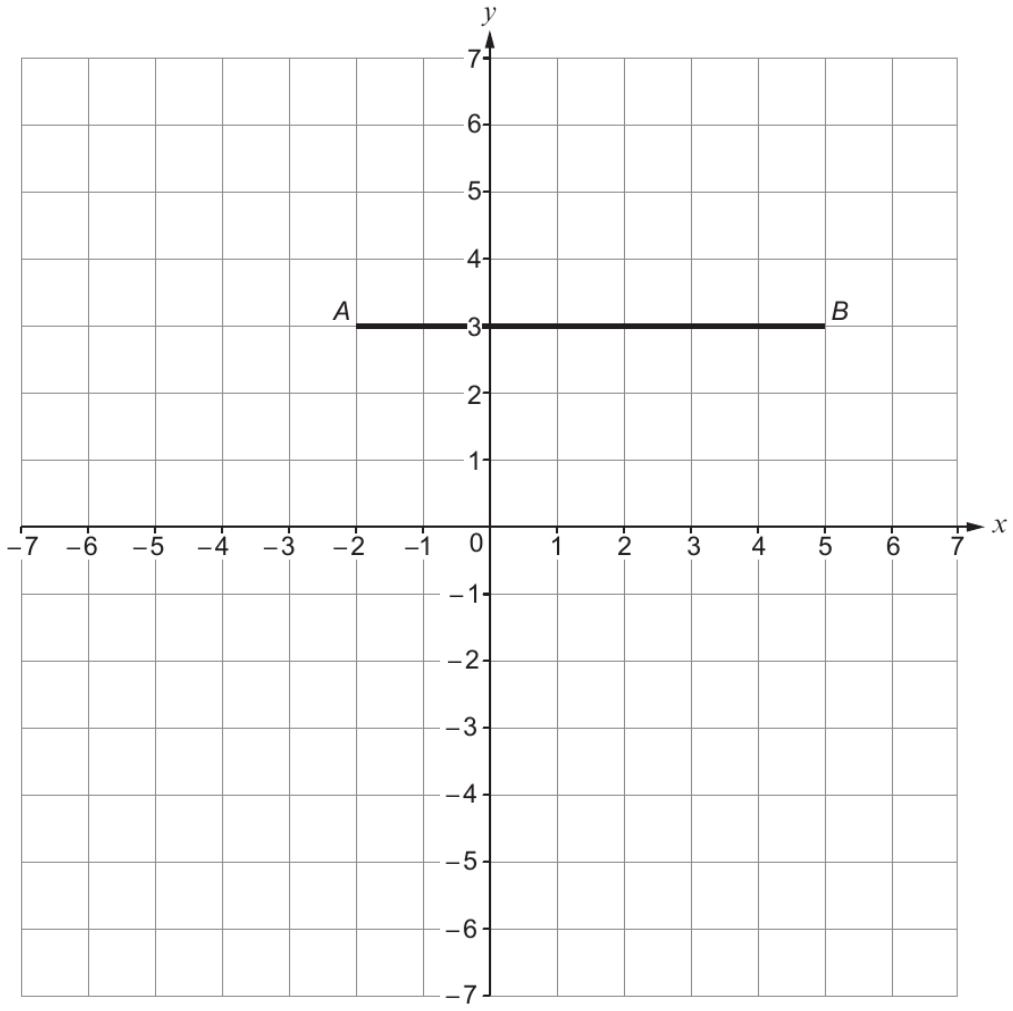


Examiner only

(b) *C* is a point on the grid below so that:

- $\widehat{BAC} = 90°$,
- $AC = AB$.

(i) Show the position of point *C* **on the grid**. [2]



(ii) Write down the coordinates of point *C*. [1]

.....

3300U301
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Examiner only

4. *(a)* One of these letters has exactly one line of symmetry.
Circle this letter. [1]

P H Z D O

(b) One of these letters has rotational symmetry of order 2.
Circle this letter. [1]

V T S L M

5. *(a)* Write a number in the empty box to make the calculation correct. [1]

$20 - \square + 6 = 17$

(b) Put +, –, × or ÷ in each space below to make the calculation correct. [1]

18 ..... 6 ..... 2 = 1

Examiner only

10. You are given that $543 \times 17 = 9231$.

(a) What is the value of $5{\cdot}43 \times 1{\cdot}7$?
Circle the correct answer. [1]

0·9231 9·231 92·31 923·1 9231

.....

.....

(b) What is the value of $\frac{9231}{54{\cdot}3}$?

Circle the correct answer. [1]

0·17 1·7 17 170 1700

.....

.....

(c) What is the value of $\frac{9231}{543 \times 1{\cdot}7}$?

Circle the correct answer. [1]

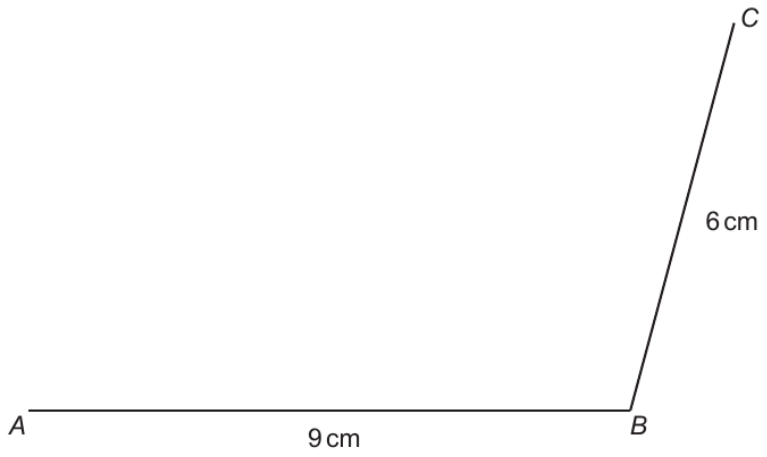
0·1 1 10 100 1000

.....

.....

Examiner only

19. *(a)* Two sides of a parallelogram *ABCD* are drawn accurately below.
Using only a ruler and a pair of compasses, complete an accurate drawing of the parallelogram.
You must show all your construction arcs. [2]



(b) The line *XY* below forms part of a scale drawing of a garden.
The scale drawing has a scale of 1:200.

What is the actual distance between point *X* and point *Y* in the garden?
Give your answer in **metres**. [3]

.....

.....

.....

.....

Actual distance between point *X* and point *Y* = ... metres

Examiner only

1. *(a)* Write 95 048 in words. [1]

(b) Find the sum of 872 and 59. [1]

(c) Multiply 250 by 5. [1]

(d) Work out $\frac{1}{3}$ of 624. [1]

(e) Write down all the factors of 18. [2]

The factors of 18 are .....

Examiner only

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.
Write down, in terms of n, the total number of grapes Adrian now has. [1]

.....

8. 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
$\frac{1}{4}$	0·25	25%
$\frac{7}{10}$	.....	..... %
$\frac{.....}{20}$	.....	5%

.....

9. Find $\sqrt{11{\cdot}56} + 2{\cdot}5^2$. [1]

.....

.....

Examiner only

15. (a) Find a whole number value of n, so that $7n-9$ is a multiple of 4.
You must show all your working. [2]

When n = ..., $7n-9$ is a multiple of 4.

(b) Find a whole number value of n, so that $3n-5$ is a prime number.
You must show all your working. [2]

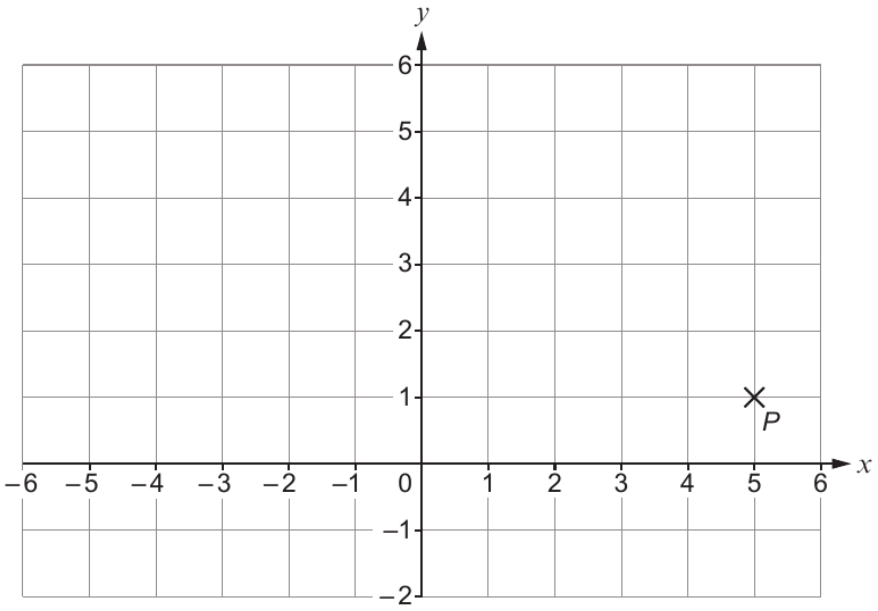
When n = ..., $3n-5$ is a prime number.

Examiner only

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

5	.....	×	4	7	=	2	4	.....	1

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

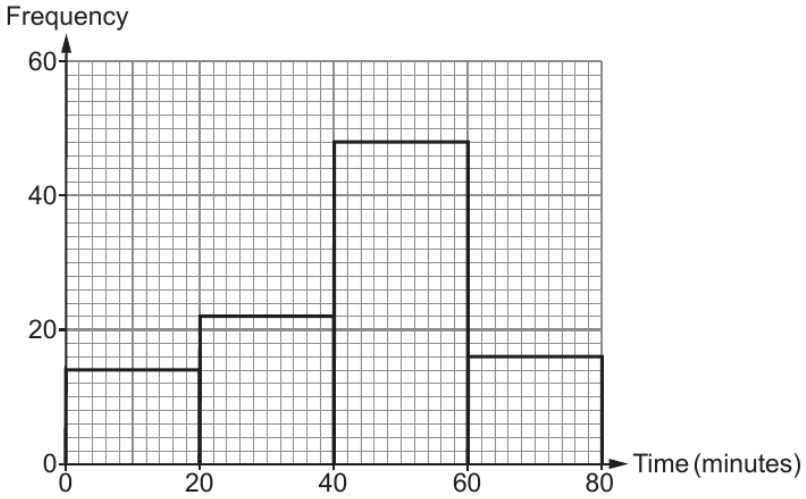


Steve writes the coordinates of *P* as 1; 5.
Explain what is wrong with the way Steve has written the coordinates. [2]

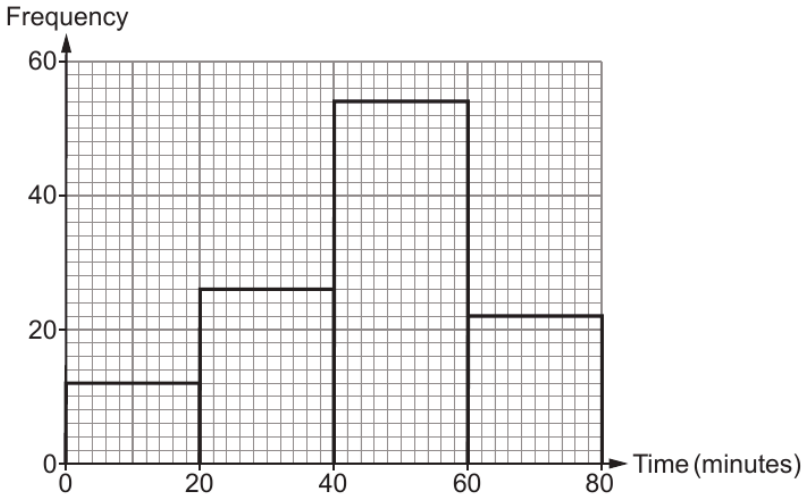
3300U201
05

3. The frequency diagrams below show the lengths of time that men and women spent training in the gym on Friday.

Time spent training – Men



Time spent training – Women



Examiner only

(a) Freddie says he spent exactly 1 hour 25 minutes training in the gym on Friday.
Explain how you know that Freddie is not telling the truth. [1]

(b) How many men spent less than 20 minutes training in the gym on Friday?
Circle your answer. [1]

12 14 54 6 20

(c) How many women spent less than 40 minutes training in the gym on Friday?
Circle your answer. [1]

14 26 34 38 76

(d) Gwen says,

"A greater **proportion** of women than men spent between 40 and 60 minutes training in the gym on Friday."

Is Gwen's statement true or false?

True ☐ False ☐

You must show all your working to support your answer. [5]

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.

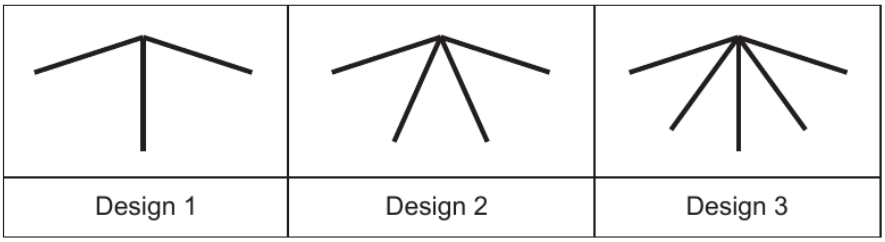
How much does each large box cost?
You must show all your working. [3 + 2 OCW]

Examiner only

4. A jewellery designer makes brooches.
Each brooch consists of a number of identical pieces of metal.

These brooches come in different designs.
These designs follow a simple pattern.

The first three designs are shown below.
Design 1 consists of 3 pieces of metal.



Design 1	Design 2	Design 3

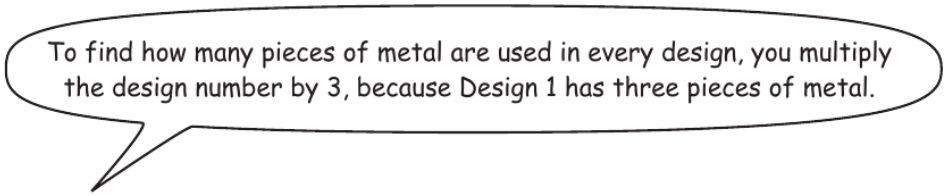
(a) How many pieces of metal will be used to make the brooch in Design 5? [1]

.....

(b) Which design uses 11 pieces of metal? [1]

.....

(c) A customer says,



Is the customer correct for every design?

Yes ☐ No ☐

Give a reason for your answer. [1]

.....

.....

.....

.....

Examiner only

(d) One customer decides to order a special brooch with a horizontal bar at the top.

The designer knows two of the angles. These are shown in the diagram below.

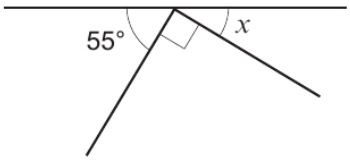


Diagram not drawn to scale

Calculate the size of angle x. [2]

.....

.....

$x =$ ..... °

(e) The designer uses the following formula to calculate how much he will charge for a brooch.

Charge for a brooch (in £) = 2 × cost of materials + 14

A customer spends £30 on a brooch for a friend.

Calculate the cost of the materials for this brooch. [2]

.....

.....

.....

.....

Cost of materials is £ .....

Examiner only

5. (a) Iwan recorded his gas usage for a week.
His meter reading was 21 345 kWh at the start of the week.
His meter reading was 21 640 kWh at the end of the week.

Gas costs 7.2p per kWh.
VAT at 5% is payable on the cost of any gas used.

Calculate the total cost of Iwan's gas for the week.
You must show all your working. [5]

Examiner only

(b) For the first 7 days of October, the mean daily outside temperature at midday where Iwan lives was 13·2°C.
The temperatures at midday for the next 2 days of October were 12·2°C and 12·4°C.

Calculate the total of the temperatures for the first 7 days.
Hence, calculate the mean midday temperature for the first 9 days of October.
You must show all your working. [4]

The mean midday temperature for the first 9 days of October was ..... °C

(c) The plan of the streets where Iwan lives is shown below.

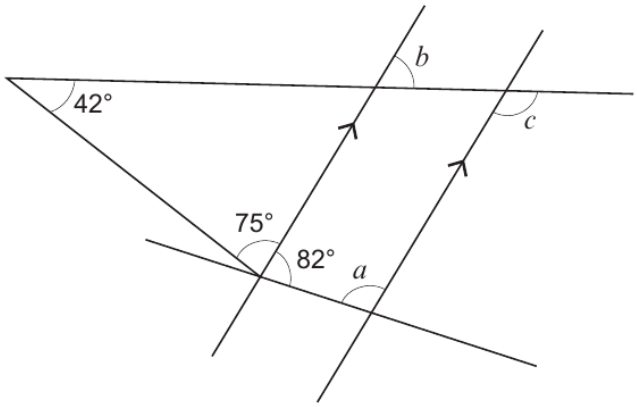


Diagram not drawn to scale

Find the size of each of the angles a, b and c. [3]

a = ... ° b = ... ° c = ... °

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

13. (a) Solve the equation $3x - 10 = 17$. [2]

(b) Simplify $6f - 4g + 2f - 9g$. [2]

14. (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

Examiner only

15. In the diagram below, AD is a straight line.

$B\hat{A}C = 90°$, $B\hat{D}E = 90°$ and $C\hat{B}E = 90°$.

$AC = 7{\cdot}7$ cm, $BC = 11{\cdot}3$ cm and $BD = 13{\cdot}1$ cm.

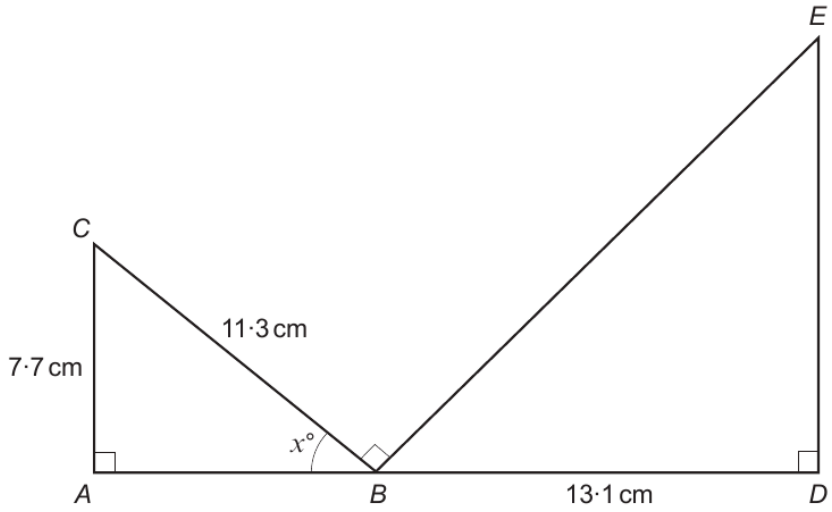
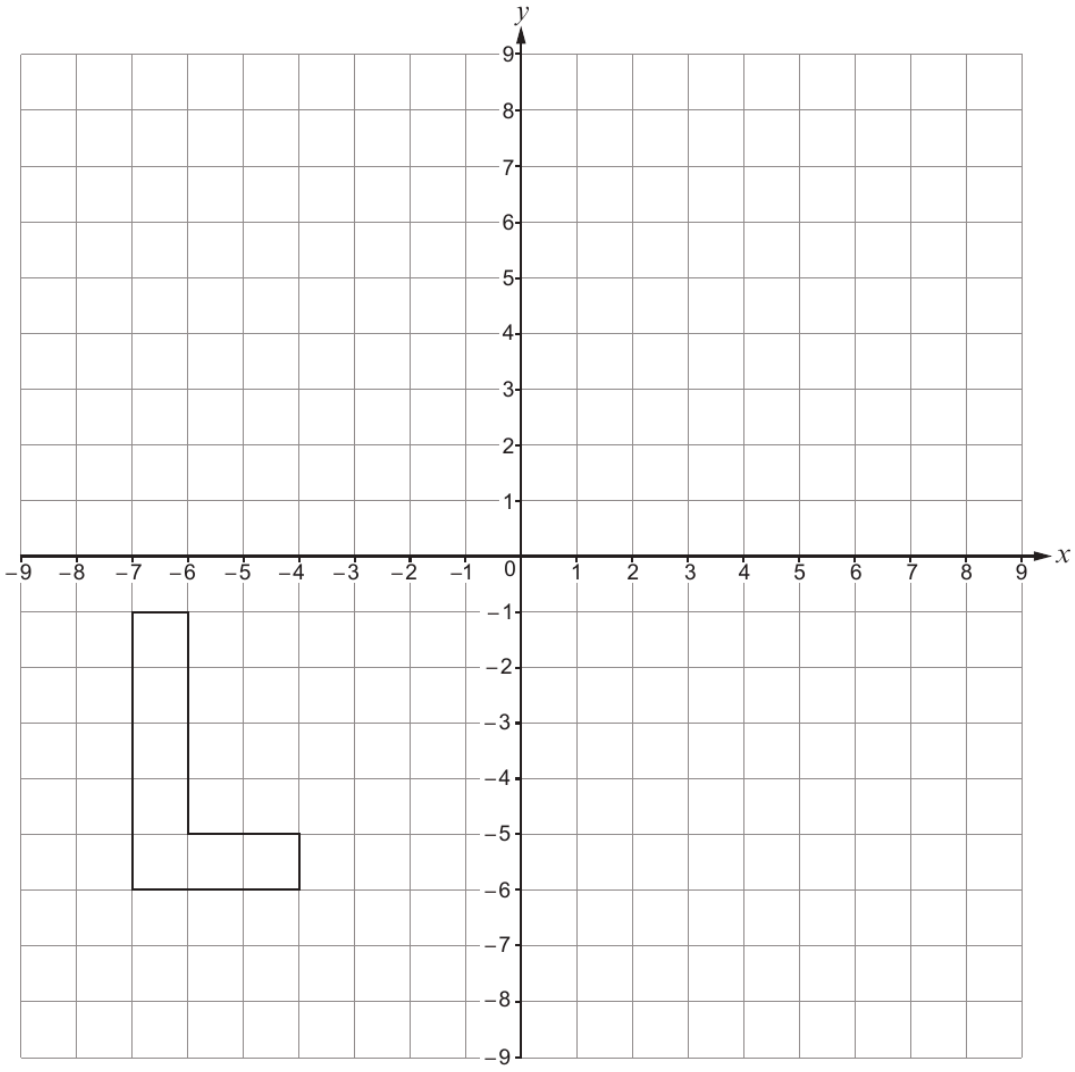


Diagram not drawn to scale

(a) Calculate the value of x. [3]

Examiner only

20. Rotate the shape shown below by 90° anticlockwise about the origin. [2]



END OF PAPER

Examiner only

20. XY is a tangent to a circle, centre O, at the point A.
$\hat{AYO} = 54°$.

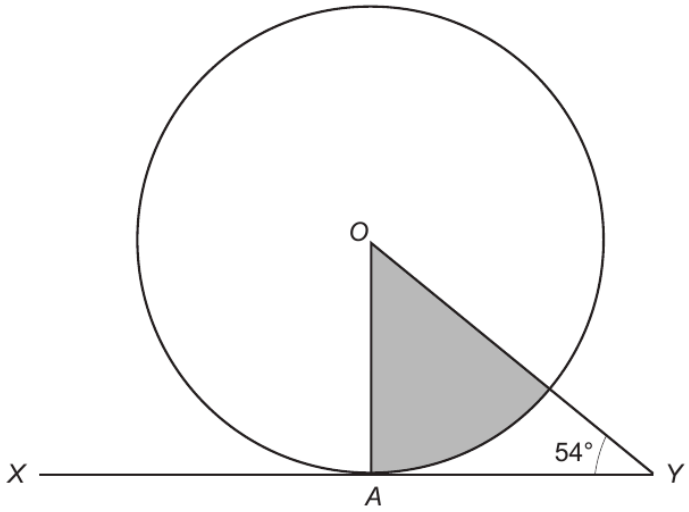


Diagram not drawn to scale

(a) What percentage of the whole circle is shaded?
You **must** show how you calculated your answer. [3]

(b) What tangent property of circles did you use in order to answer part (a)? [1]

END OF PAPER

Examiner only

1. Glen is trying to keep fit.

Glen works every day from Monday to Friday.
He sets himself two targets for these days.
The targets are to walk:

- at least 10 000 steps **every day** from Monday to Friday
- at least 50 000 steps **in total** from Monday to Friday.

He records the number of steps he takes each day from Monday to Friday.

Day	Number of steps
Monday	10 672
Tuesday	13 586
Wednesday	12 341
Thursday	11 932
Friday	9754

(a) Has Glen achieved his target to walk at least 10 000 steps **every day**?
Give a reason for your answer. [1]

Yes ☐ No ☐

.....

.....

.....

(b) Glen's second target was to walk at least 50 000 steps from Monday to Friday.
By how many steps did he beat this target? [2]

.....

.....

.....

(c) Approximately how many steps did Glen walk on Tuesday?
Give your answer correct to the nearest 100. [1]

.....

3310U201
03

Examiner only

2. (a) Arwyn doubles the number fifty-three thousand.
Write Arwyn's answer in figures. [2]

(b) Write 3572 correct to the nearest 100. [1]

(c) Calculate $6+4\times9$. [1]

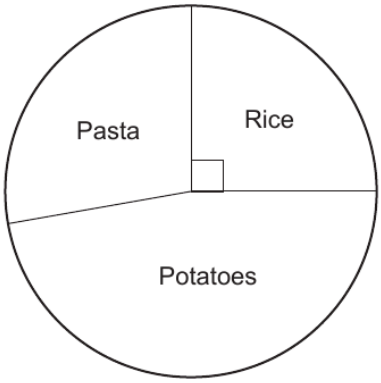
(d) Estimate $103\times9\cdot8$. [2]

(e) Can 626 be divided exactly by 3?
You must show working to support your answer. [1]

Yes ☐ No ☐

Examiner only

2. In a survey, 540 people were asked if they preferred pasta, rice or potatoes.
They were asked to choose just one preference.
The results are displayed in the accurately-drawn pie chart below.



(a) How many people preferred rice? [2]

..... people

(b) The sector for potatoes on the pie chart is to be split.
40% of the people who chose potatoes said they preferred chips.

What will be the size of the angle in the sector for **chips**?
You must show all your working. [3]

..... °

(c) 540 people took part in the survey. $\frac{7}{10}$ of these people were children..
How many people who took part in the survey were **not** children? [2]

Number of people who were **not** children .....

Examiner only

4. (a) Find $\frac{3}{7}$ of 9·17 km.

Give your answer in metres. [3]

..... metres

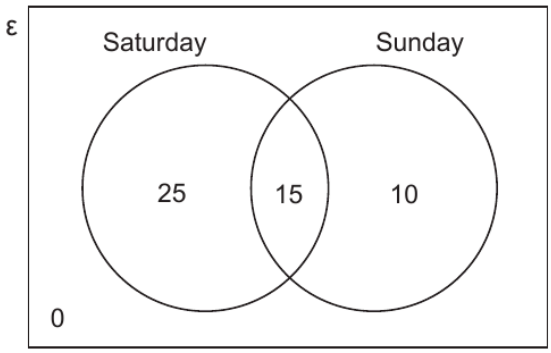
(b) Express 25 minutes as a percentage of 2 hours 5 minutes. [3]

Examiner only

5. 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.



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

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

Examiner only

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

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]

(b) Calculate 4% of £250. [2]

(c) Laura thinks of a number.

$\frac{1}{5}$ of her number is 14.

What is 50% of Laura's number? [3]

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

Examiner only

13. Here is a net of a cuboid.

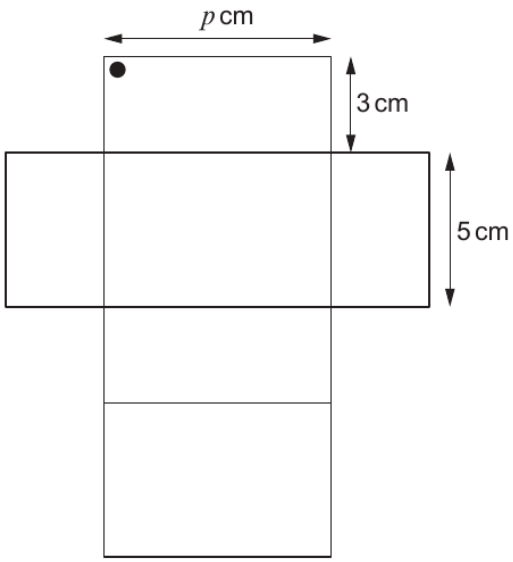


Diagram not drawn to scale

The net is folded to form a cuboid.

(a) The corner marked with ● meets two other corners on the net.
Mark these two other corners with ●. [2]

(b) The volume of the cuboid is 90 cm^3.
What is the value of p? [2]

.....

.....

.....

.....

Examiner only

1. Solve each of the following equations.

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

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

2. (a) Evaluate 55% of 42·8. [2]

(b) Which one of the following is **not** equal to a recurring decimal?
Circle the correct answer. [1]

$\frac{2}{11}$ $\frac{2}{3}$ $\frac{3}{16}$ $\frac{7}{9}$ $\frac{5}{6}$

Examiner only

1. Morgan wants to buy the following items from a shop.

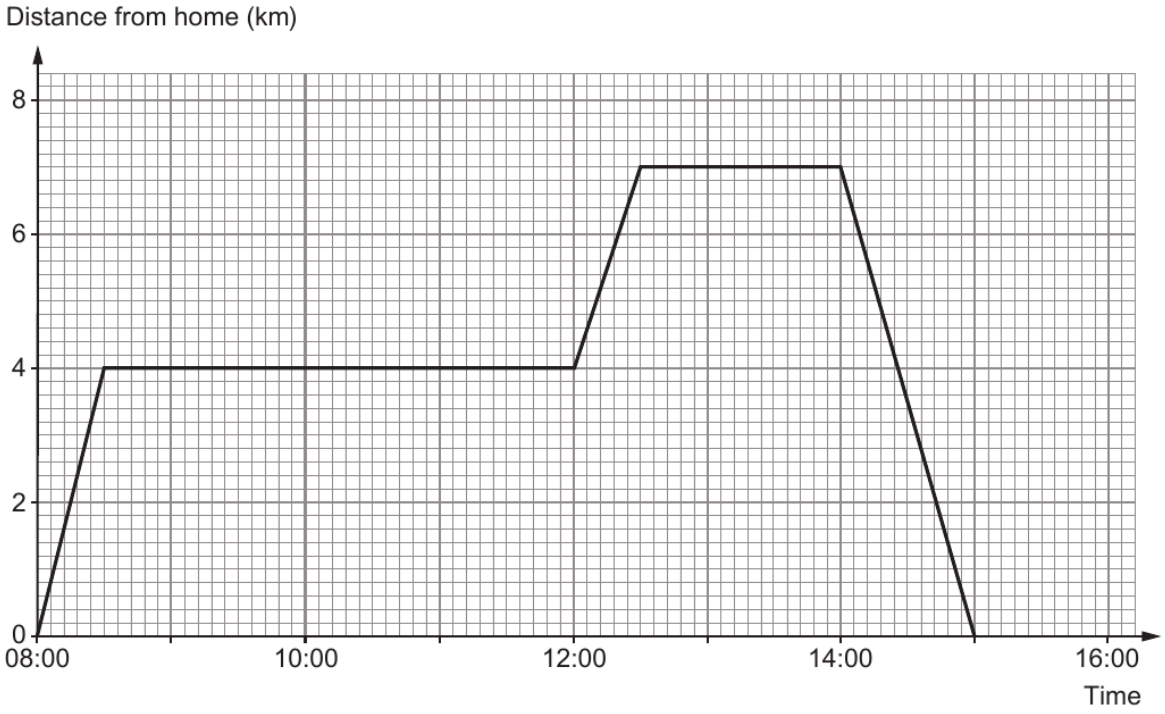
(a) Morgan uses a calculator to find the total cost of the items.

He thinks the total is £112.44.
What mistake has Morgan made? [1]

(b) Morgan pays for all the items with a £20 note.
How much change will he get? [2]

Examiner only

2. On Tuesday, Alfred travelled on a straight road.
The graph represents his journey during the day, until the time he arrived home.



(a) At what time did Alfred arrive home on Tuesday? [1]

.....

(b) How far, in total, did Alfred travel during the day on Tuesday? [1]

.....

..... km

(c) During which part of the day did Alfred travel at an average speed of 6 km per hour?
Circle your answer. [1]

08:00 to 08:30 08:30 to 12:00 12:00 to 12:30

12:30 to 14:00 14:00 to 15:00

.....

.....

Examiner only

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

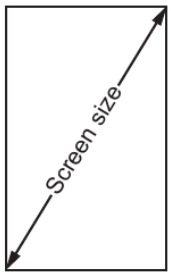
Mari is buying a new mobile phone.
She sees two deals for the same phone, as shown below.

DEAL A	DEAL B
PAY £19.99 NOW and then £28.99 a month for 24 months	PAY £100 NOW and then £24.36 a month for 24 months
	

Which deal is the cheaper for Mari over 24 months?
How much cheaper is this deal?
You must show all your working. [5 + 2 OCW]

Examiner only

(b) The screen size of a mobile phone is given as the length of the diagonal of the screen.



Mari is trying to find the screen size of the new phone.
This phone has a rectangular screen with height 12·8 cm and width 6·3 cm.
Mari has started to draw an accurate diagram below.
She has drawn a line for the width of the phone.

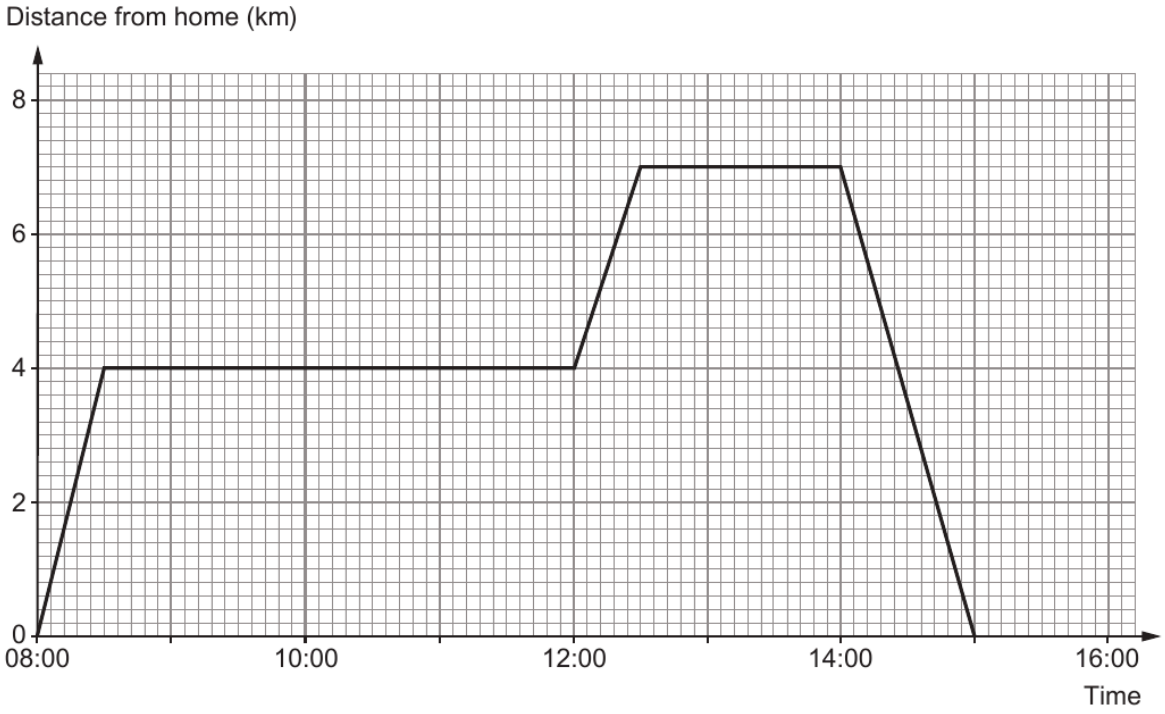
Complete the diagram to find the screen size.
Give your answer in cm, correct to 1 decimal place. [3]

Width 6·3 cm

Screen size of the new phone (correct to 1 decimal place) = ... cm

Examiner only

5. On Tuesday, Alfred travelled on a straight road.
The graph represents his journey during the day, until the time he arrived home.



(a) At what time did Alfred arrive home on Tuesday? [1]

.....

(b) How far, in total, did Alfred travel during the day on Tuesday? [1]

.....

..... km

(c) During which part of the day did Alfred travel at an average speed of 6 km per hour?
Circle your answer. [1]

08:00 to 08:30 08:30 to 12:00 12:00 to 12:30

12:30 to 14:00 14:00 to 15:00

.....

.....

Examiner only

6. Erin owns a small shop.
Last year, Erin's income from her shop was 26 000 euros.
Erin had to pay tax on all of this income.
She paid 20% tax on the first 15 000 euros of this income.
She paid 30% tax on the rest of this income above 15 000 euros.

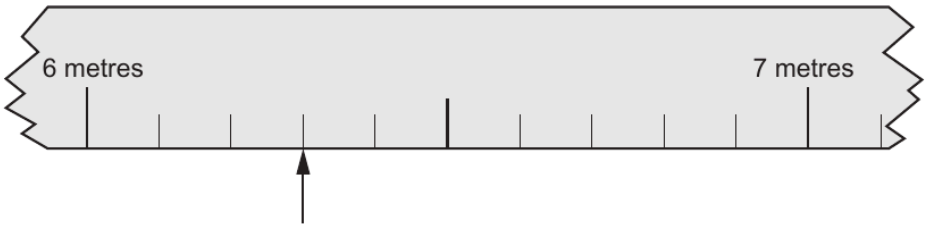
Calculate how much tax Erin paid in total.
You must show all your working. [5]

Examiner only

12. (a) How many minutes are there in 1 day and 5 hours? [2]

1 day and 5 hours = ... minutes

(b) The diagram below shows part of a measuring tape used in a long-jump competition.



The arrow indicates the distance jumped by the competitor who came second.

The winning jump was 676 cm long.

What was the difference between the lengths of these jumps? [3]

Examiner only

2. (a) Write down the value of the 3 in the number 532 719. [1]

(b) Add the numbers 865 and 92 and 407. [1]

(c) Subtract 647 from 1029. [1]

3. (a) Which is the best metric unit for measuring the mass of a pencil?
Circle the correct answer. [1]

kilograms grams tonnes centimetres milligrams

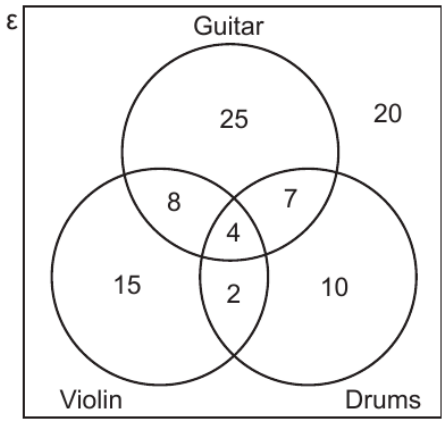
(b) Which is the best metric unit for measuring the distance from Swansea to Wrexham?
Circle the correct answer. [1]

millimetres metres kilometres litres kilograms

Examiner only

3. A music teacher asked all Year 7 students to choose which musical instruments they would like to be able to play.
They could choose from three instruments: guitar, drums and violin.
The students could choose as many of these instruments as they wished.

The Venn diagram shows the results.



(a) How many students did not choose an instrument? [1]

..... students

(b) How many students chose all 3 instruments? [1]

..... students

(c) How many Year 7 students were there? [1]

.....

..... students

(d) How many students chose 2 or more instruments? [1]

.....

..... students

(e) Which was the least popular instrument?
How many students chose this instrument? [1]

.....

.....

Least popular instrument .....

Number of students .....

Examiner only

4. In the grid below:

- each column must add to 150
- each row must add to 150.

Complete the grid. [3]

83	.....	.....
45	.....	88
.....	93	.....

.....

.....

.....

.....

.....

.....

5. Sophie says,

"5 minutes 8 seconds is double 2 minutes 54 seconds."

Is Sophie correct?

YES ☐ NO ☐

You must show working to support your answer. [2]

.....

.....

.....

.....

.....

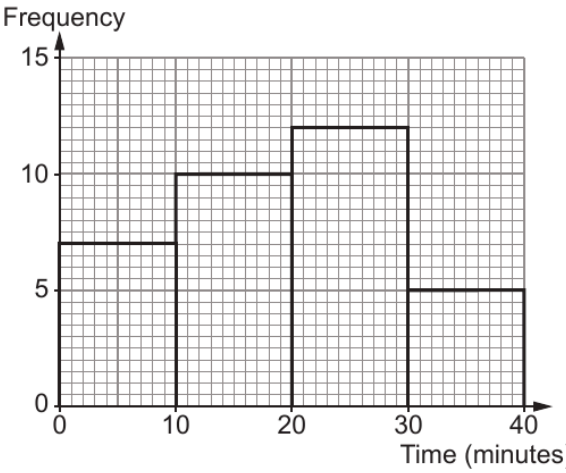
Examiner only

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.

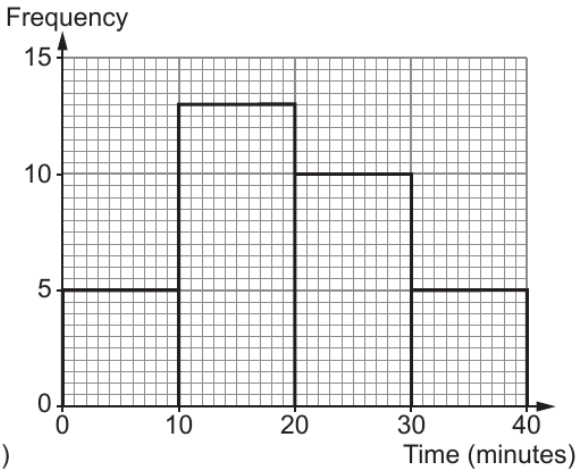
The frequency diagrams below show the results.
The groups used are as follows:

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

Year 9



Year 10



(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]

.....

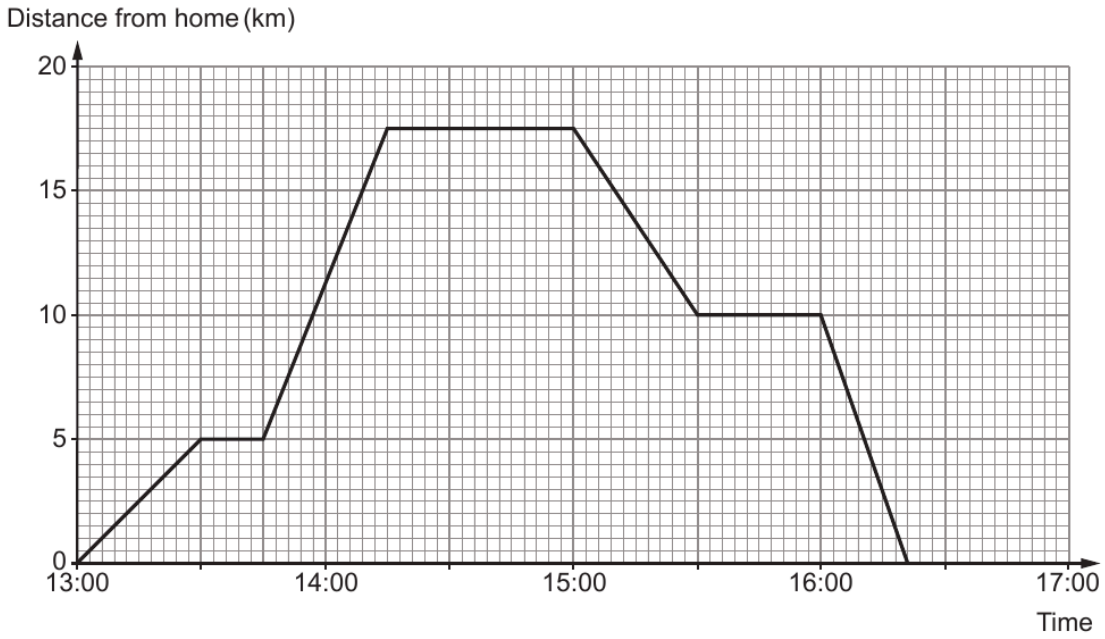
.....

.....

.....

Examiner only

5. Yesterday, Jemila cycled along a straight track from home to the beach and back.



(a) For how many minutes was Jemila 17·5 km from home? [1]

..... minutes

(b) At what time did Jemila first start cycling in the direction of home?
Circle your answer. [1]

13:30 14:15 15:00 15:30 16:00

(c) By 15:30, how many kilometres in total had Jemila cycled? [1]

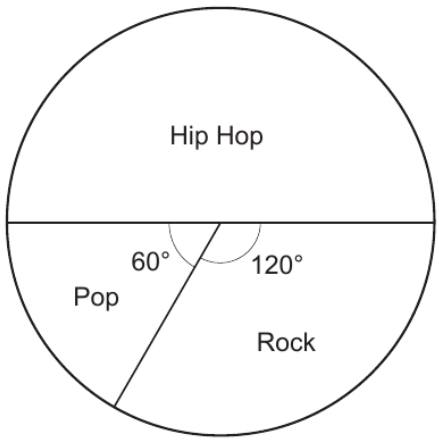
..... km

(d) Jemila was due to get home at 16:30.
She arrived home early.
How many minutes early was she? [1]

..... minutes

Examiner only

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]

.....

.....

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

.....

.....

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

.....

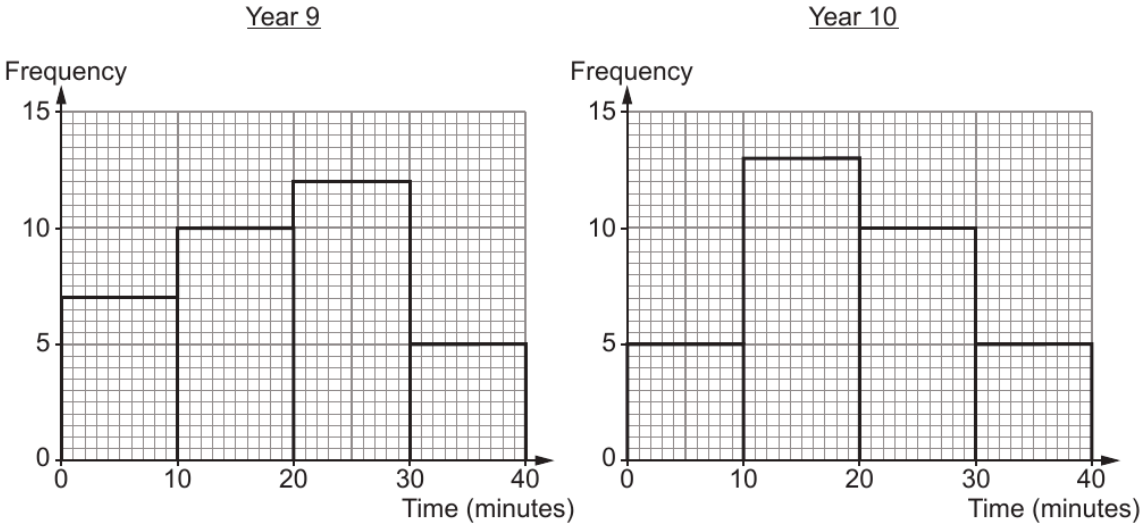
.....

Examiner only

7. 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:

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



(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]

.....

.....

.....

.....

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]

.....

.....

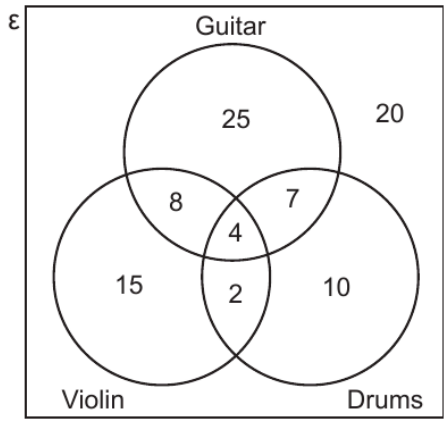
.....

END OF PAPER

Examiner only

7. A music teacher asked all Year 7 students to choose which musical instruments they would like to be able to play.
They could choose from three instruments: guitar, drums and violin.
The students could choose as many of these instruments as they wished.

The Venn diagram shows the results.



(a) How many students did not choose an instrument? [1]

..... students

(b) How many students chose all 3 instruments? [1]

..... students

(c) How many Year 7 students were there? [1]

.....

..... students

(d) How many students chose 2 or more instruments? [1]

.....

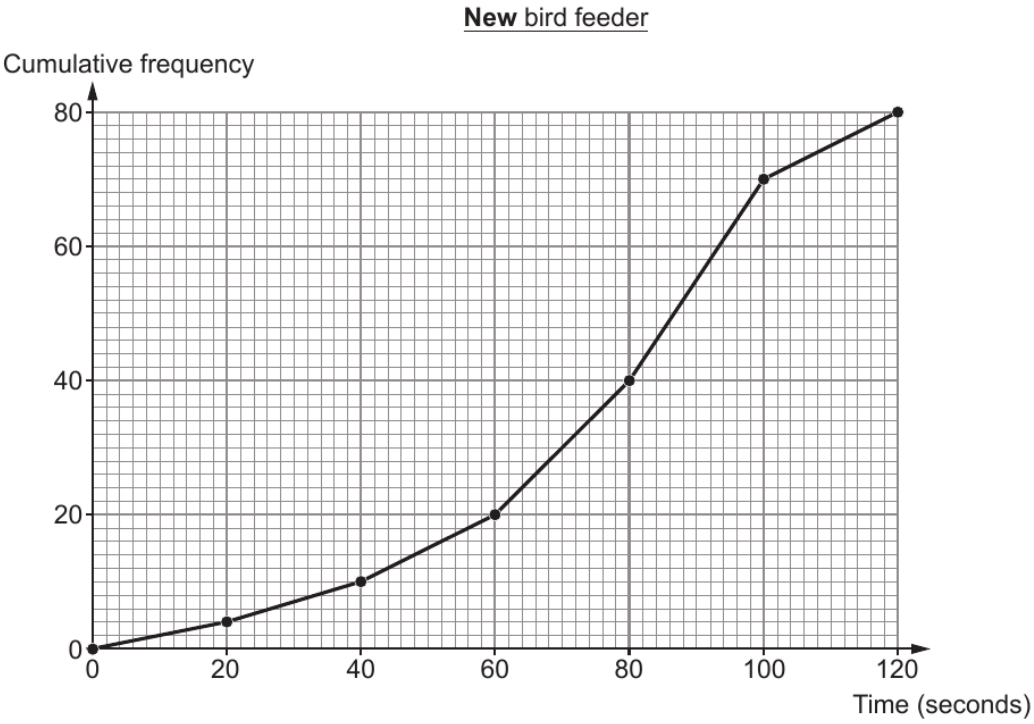
..... students

10. Aderyn is a company that makes bird feeders.

Squirrels often try to steal food from bird feeders.

To make this more difficult, Aderyn has designed a **new** bird feeder. Aderyn tests its new feeder to check how long it takes squirrels to reach the food inside.

The results are displayed in the cumulative frequency diagram below.



(a) Aderyn has the following information about the time it took squirrels to reach the food in its **original** bird feeder.

Original bird feeder	
Modal group	60 to 80 seconds
Median time	75 seconds
Interquartile range	20 seconds

Examiner only

Aderyn compared the times squirrels take to reach the food in the original bird feeder and the times they take to reach food in the new bird feeder.

(i) Complete this sentence:

'The modal group for the new bird feeder is between ..... and ..... seconds.'

Does the modal group for the new bird feeder imply that there is an improvement in the times? [1]

Yes ☐ No ☐

(ii) Use the cumulative frequency diagram and the table to give the best estimate to complete each of the following sentences.

I. 'The difference between the median times is ..... seconds.' [1]

.....

II. 'The difference between the interquartile ranges of the times is ..... seconds.' [2]

.....

.....

.....

(b) Use the cumulative frequency diagram to give the best estimate to complete the following sentence. [3]

'20% of the squirrels took ..... seconds or more to reach the food in the new bird feeder.'

.....

.....

.....

Examiner only

(c) The population density of grey squirrels in forests depends on the variety of tree that grows there.

Variety of tree	Typical population density of grey squirrels **per km^2**
Oak	1200
Chestnut	100
Pine	45

Rhian says,

I know that Maesgwyn forest has only one variety of tree: oak, chestnut or pine.

Maesgwyn forest covers an area of 21 500 m^2.
There are 24 grey squirrels living in Maesgwyn forest.

From this information, which variety of tree is most likely to be found in Maesgwyn forest?

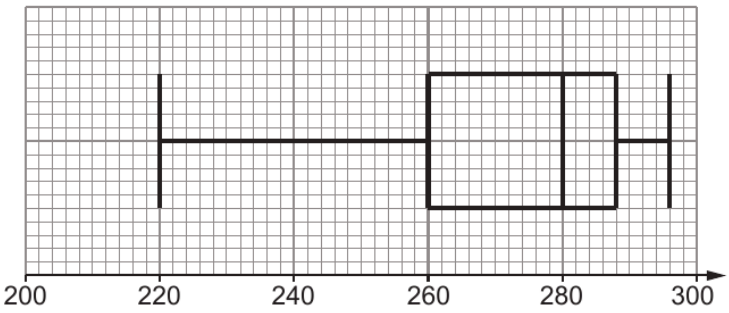
You must show working to support your answer. [3]

Oak ☐ Chestnut ☐ Pine ☐

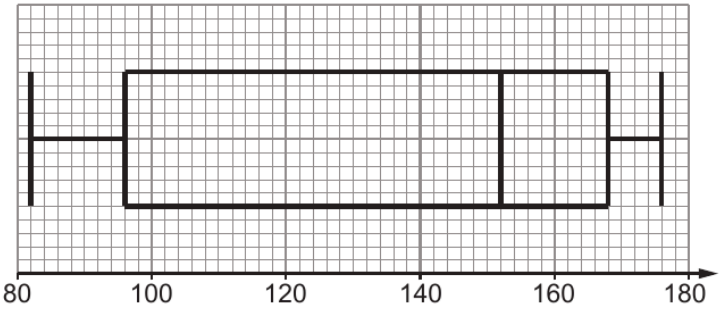
11. Geraint has collected data on some adult gulls.
He weighed 400 slender-billed gulls, 400 little gulls, and 400 black-headed gulls.

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

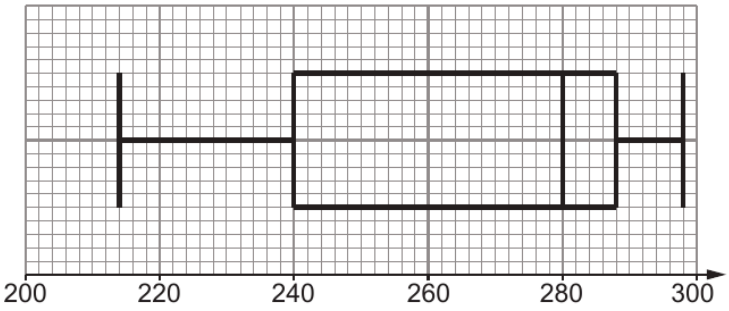
Slender-billed gulls



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

16. A rectangle has length $(x+5)$ cm and width $(x+3)$ cm.
The area of the rectangle is 120 cm^2.

(a) Show that $x^2+8x-105=0$. [2]

(b) Factorise $x^2+8x-105$, and hence solve $x^2+8x-105=0$. [3]

(c) Use your solutions from part (b) to find the dimensions of the rectangle.
You must justify any decisions that you make. [2]

Length of rectangle = ... cm

Width of rectangle = ... cm