Surname	Centre Number	Candidate Number
Other Names		0

GCSE

3310U30-1

A18-3310U30-1

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER

TUESDAY, 6 NOVEMBER 2018 – MORNING

1 hour 45 minutes

ADDITIONAL MATERIALS

The use of a calculator is not permitted in this examination.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet. Question numbers must be given for all work written on the continuation page.

Take π as 3·14.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

In question **3***(a)*, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**5**	
2.	**7**	
3.	**11**	
4.	**5**	
5.	**11**	
6.	**4**	
7.	**4**	
8.	**4**	
9.	**10**	
10.	**8**	
11.	**7**	
12.	**4**	
Total	**80**	

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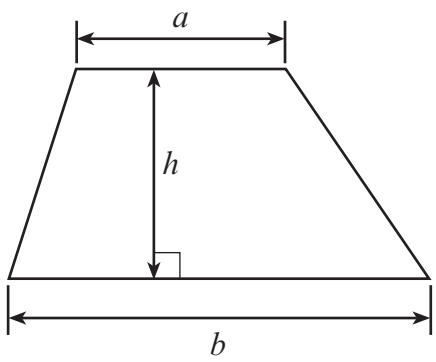
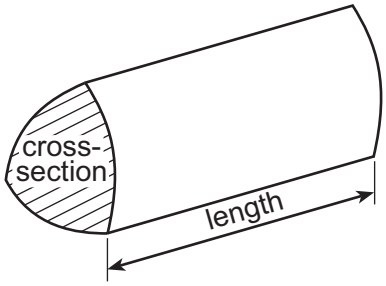
Formula List – Intermediate Tier

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. Ffion is making a box for a present.
The box is a cuboid.
Ffion draws a sketch of a net of the cuboid.

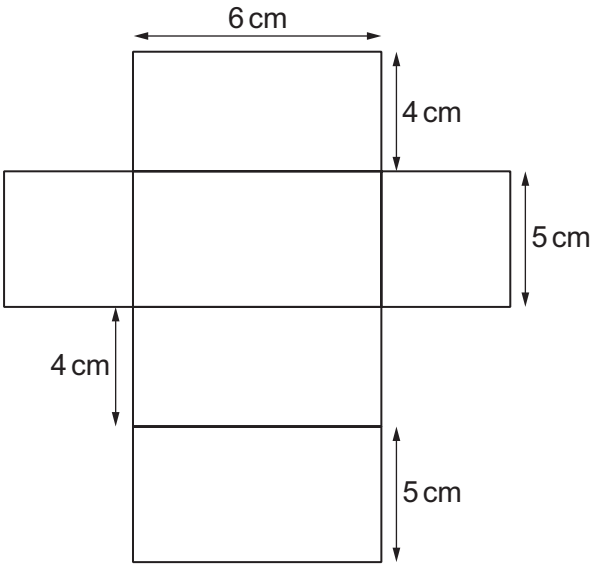

Diagram not drawn to scale

(a) Write down the height, length and width of the box. [1]

Height is ..... cm Length is ..... cm Width is ..... cm

(b) After Ffion has finished making the box, she cuts and sticks coloured string along each edge of the finished box.

The string costs 3p for every 2 cm.
How much will Ffion spend on the string?
You must show all your working. [4]

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Cost of the string is .....

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2. *(a)* Rob has carried out a survey.
He asked 25 students how many times they visited the library last month.
His results are shown below.

Number of library visits	0	1	2	3	4	5
Tally		𝍸 I	𝍸 II	IIII	𝍸 III	

Using Rob's results, answer the following questions.

(i) What is the range?
Circle your answer. [1]

0 1 2 3 4 5

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(ii) What is the median?
Circle your answer. [1]

0 1 2 3 4 5

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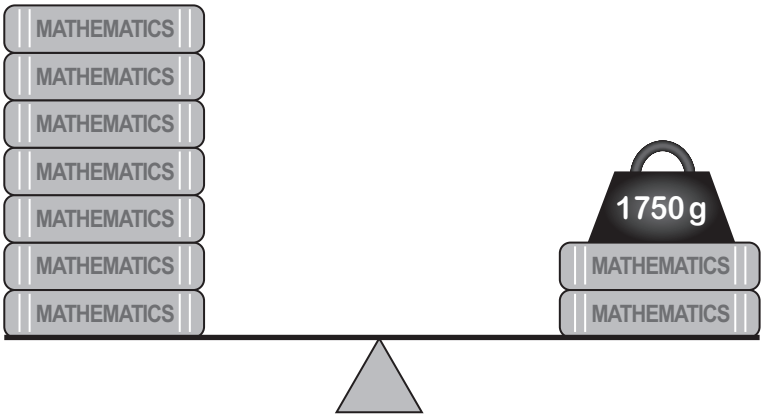
(b) Rob puts some books and a weight on a set of balance scales.
All the books are identical.



What is the mass of one book? [2]

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(c) Rob balances some identical dictionaries.
10 dictionaries are on one side.
2 dictionaries and a 3200 g weight are on the other side.

Let the mass of one dictionary be x grams.

(i) Use the information above to write an equation in terms of x. [1]

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(ii) Find the total mass of **all 12** dictionaries. [2]

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The total mass of all 12 dictionaries is ..... g

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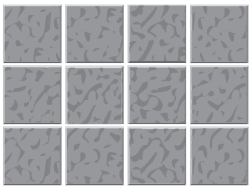
3. (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Tref-tiles sells boxes of small wall tiles.
Three different boxes are available.



Box of 25 tiles for £7.50	Box of 40 tiles for £11.20	Box of 100 tiles for £29

Catrin is buying a very large quantity of these small tiles to cover all the walls in her bathroom.
Which box offers the best value for money?
You must show all your working. [4 + 2 OCW]

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(b) *Tref-tiles* sells a wall tile measuring 10 cm by 20 cm.
How many of these tiles would be needed to cover a wall measuring 3 m by 4 m?
You can assume there are no gaps between the tiles.
You must show all your working. [3]

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Number of tiles is .....

(c) *Tref-tiles* has 5 boxes of tiles on special offer.
All the tiles in each box are identical.

Box	A	B	C	D	E
Shape of tile	Square	Rhombus	Regular pentagon	Right-angled triangle	Circle

3 of these boxes contain tiles that tessellate.
Manon is asked to select these 3 boxes.
Which **3 boxes** should Manon select? [2]

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Box ....., box ..... and box .....

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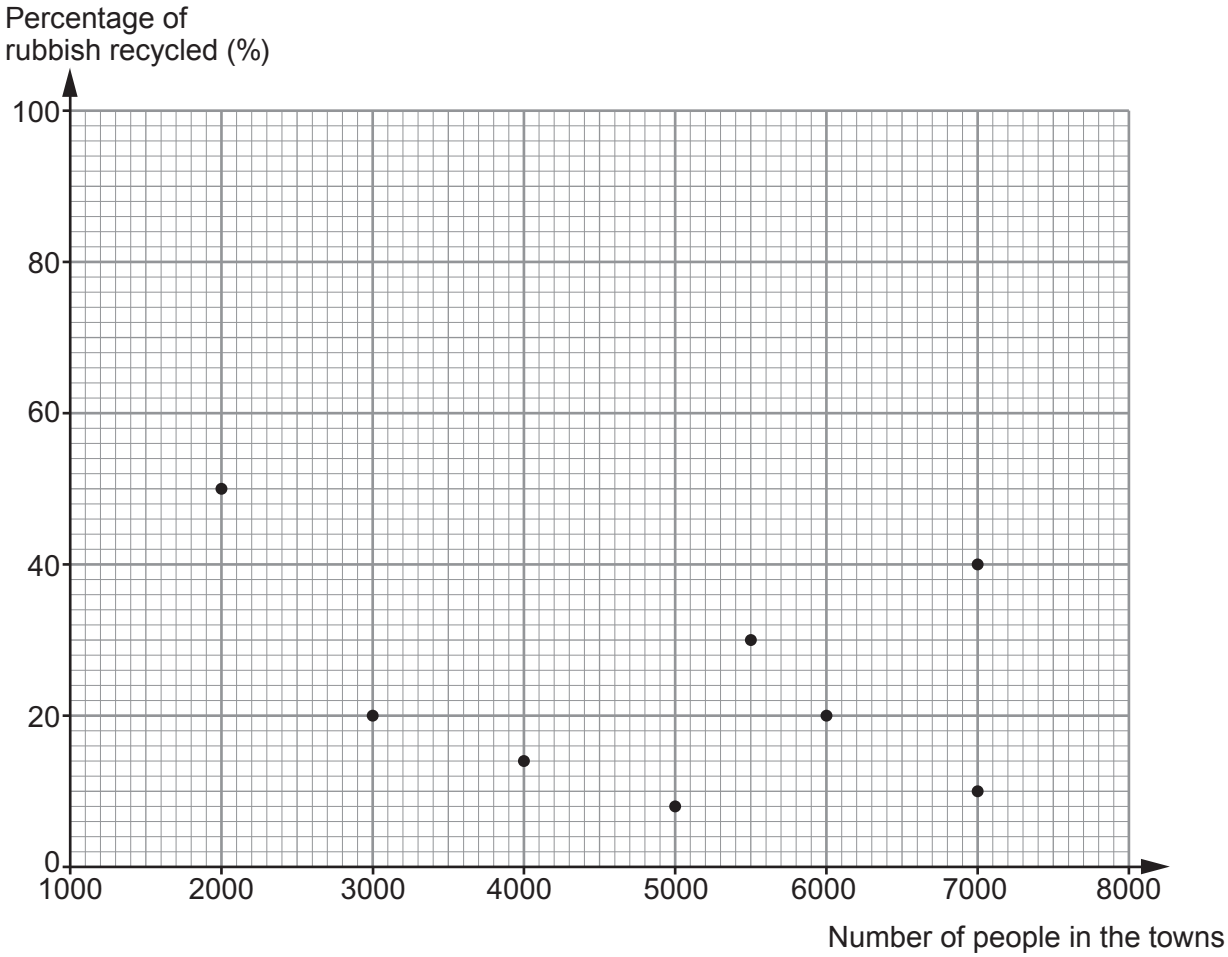
4. *(a)* The mass of rubbish recycled is given as a percentage of the total mass of rubbish produced.

The percentage of rubbish recycled by people living in 8 small towns was recorded. The results for the first week in July 2005 are shown in the scatter diagram below.



(i) Complete each of the statements below. [2]

'In July 2005, two of the 8 towns had the same number of people.
The percentages of rubbish recycled in these two towns were

..... % and ..... %.'

'The town with the least number of people had set a target of recycling 45% of rubbish for July 2005.
This small town beat this target by ..... %'

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(ii) Explain why it is **not** reasonable to use this data to estimate the percentage of rubbish recycled in a town of 9000 people. [1]

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(b) In 2016, *Merefod* town council recorded the total mass of rubbish recycled.
Of this total mass, 130 230 tonnes was paper and cardboard.

This amount of paper and cardboard was $\frac{1}{4}$ of the total mass of rubbish recycled.

Calculate the total mass of rubbish recycled. [2]

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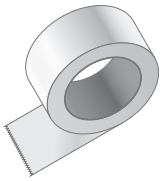
5. A badge is made using a metal button, a pin and sticky tape.

Lulu's Craft Shop

Pack of 42 metal buttons, only £2.50

Bag of 24 pins, only £1.10

60 cm roll of sticky tape, 52p



(a) Elwyn decides to buy metal buttons and pins to make badges, so that there are no metal buttons or pins left over.
He wants to buy the **least** possible number of packs of metal buttons and bags of pins.

(i) Show that Elwyn should buy 4 packs of metal buttons and 7 bags of pins.
You must show all your working. [2]

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(ii) What is the maximum number of badges Elwyn can possibly make using 4 packs of metal buttons and 7 bags of pins? [1]

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(b) Each pin is stuck on to a metal button using approximately 2·5 cm of sticky tape.

Elwyn plans to sell the badges to make the maximum profit possible.

(i) How many rolls of sticky tape should Elwyn buy? [3]

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Number of rolls of sticky tape .....

(ii) Elwyn sells all the badges he makes for 50p each.
Calculate the maximum profit he would make. [5]

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6. *(a)* Mold is on a bearing of 065° from Ruthin.
What is the bearing of Ruthin from Mold?
Circle your answer. [1]

245° 095° 295° 125° 315°

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(b) Rhyl is on a bearing of 330° from Ruthin.
What is the bearing of Ruthin from Rhyl?
Circle your answer. [1]

105° 030° 150° 075° 350°

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(c) When it is 19:40 in Cardiff, it is 23:40 in Dubai.

(i) What time is it in Dubai when it is 13:30 in Cardiff?
Circle your answer. [1]

15:30 10:30 09:30 17:30 19:30

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(ii) What time is it in Cardiff when it is 02:10 in Dubai?
Circle your answer. [1]

20:10 06:10 22:10 10:10 00:10

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7. Yousef has a piece of wallpaper.

He wants to draw some of the leaves to create a different design to screen print.

Diagram not drawn to scale

Yousef draws lines on the wallpaper.
Some of the lines are parallel.
He measures four angles and needs to calculate four more.

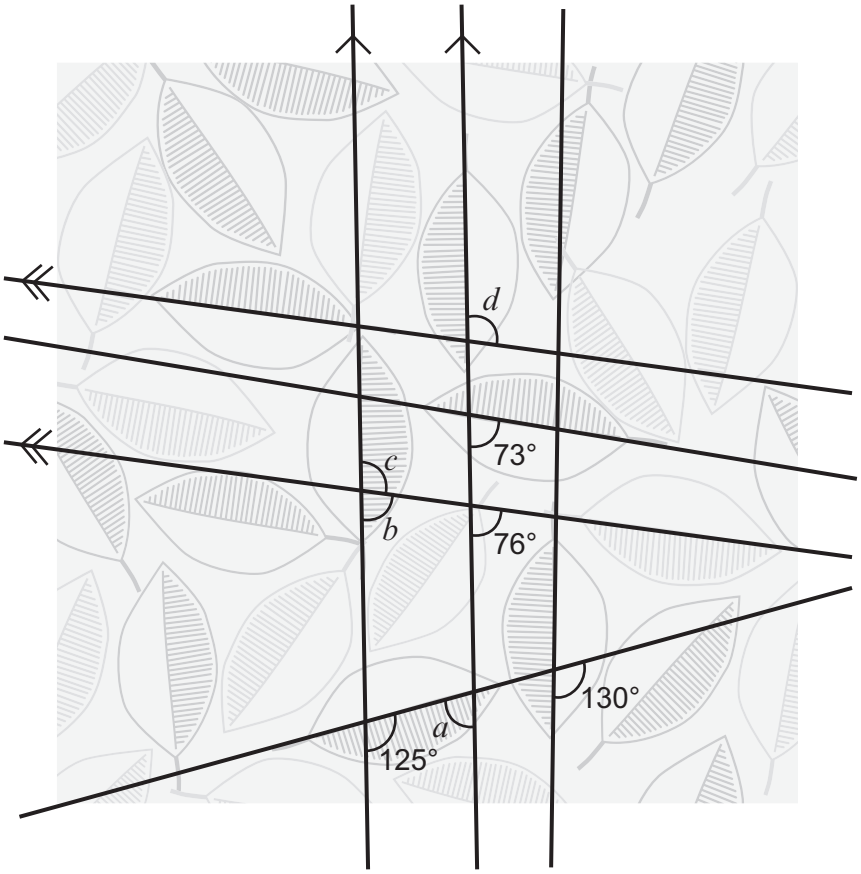

Diagram not drawn to scale

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

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a = ... ° b = ... ° c = ... ° d = ... °

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8. Mrs Butler asked all her friends how many pairs of shoes they own.
Here are the results.

Number of pairs of shoes	1 to 6	7 to 12	13 to 18
Number of people	1	5	8

(a) Which is the modal group? [1]

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(b) Mrs Butler says,

'Most people in Wales own more than 12 pairs of shoes.'

Is Mrs Butler correct in using this data to come to this general conclusion?
You must give a reason for your answer. [1]

Yes ☐ No ☐

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(c) Write down **different groups** Mrs Butler could have chosen so that all of the data can be analysed more accurately. [2]

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9. *(a)* Jade is planning a weekend break to celebrate her 21st birthday.
The weekend break costs £350.
Jade's father says,

'If you save 21% of your earnings each week for the next 20 weeks, I will give you the rest of the money you need.'

Jade earns £72 per week.
How much is Jade's father offering to pay towards her weekend break?
You must show all your working. [4]

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(b) (i) Jade has bought a new suitcase that can hold 65 litres.
What is 65 litres in cm^3?
Circle your answer. [1]

65 cm^3 650 cm^3 6 500 cm^3 65 000 cm^3 650 000 cm^3

(ii) Jade's new suitcase weighs 3 kg.
When it is packed, her suitcase must not weigh more than 25 kg altogether.
What percentage of the 25 kg does Jade have left for packing? [2]

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(iii) Which one of the following formulae could be used to work out the volume of Jade's new suitcase?
a, b and c are measurements of the 3 dimensions of the suitcase.
Circle your answer. [1]

$a + b^2 + c$ $2a^2c - 4\pi b^2$ $abc + \pi a^2c$ $a^3 - b^2 + c$ $a + b^3 + c$

(c) Jade needs a new passport photograph.
A passport photograph must be 45 mm high by 35 mm wide.

Jade has a mathematically similar photograph that she could reduce in size to use as her new passport photograph.
The height of this photograph is 9 cm.
Calculate the width of this photograph. [2]

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10. The picture shows a mountain hut.
The hut
- stands on a rectangular base,
- has a uniform cross-section.

(a) Draw a sketch of the plan view of the mountain hut. [1]

(b) This mountain hut is shown on a map.
The scale of the map is 1 : 50 000.
On the map the mountain hut is 4·2 cm from a farmhouse.
How far away is the hut from the farmhouse?
Give your answer in km. [3]

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Distance is ..... km

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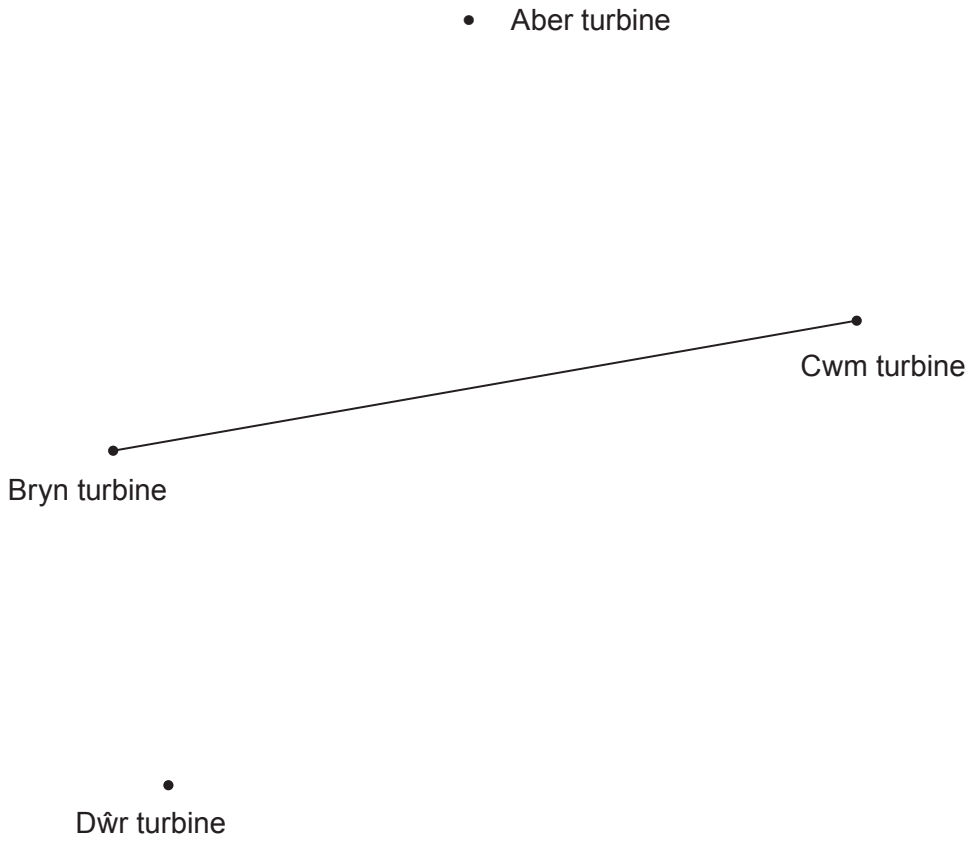
(c) The map below shows the placement of four wind turbines, and a road connecting two of the turbines.

A new wind turbine, Efail, is to be built.
It is to be placed
- on the road connecting Bryn turbine and Cwm turbine, and
- on the perpendicular from Aber turbine to the road.

The map is drawn using a scale of **2 cm represents 1 km**.

How far will Efail turbine be from Dŵr turbine?
You **must** use constructions to answer this question, using **only a pair of compasses and a ruler**. [4]

Scale 2 cm represents 1 km



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Distance is ..... km

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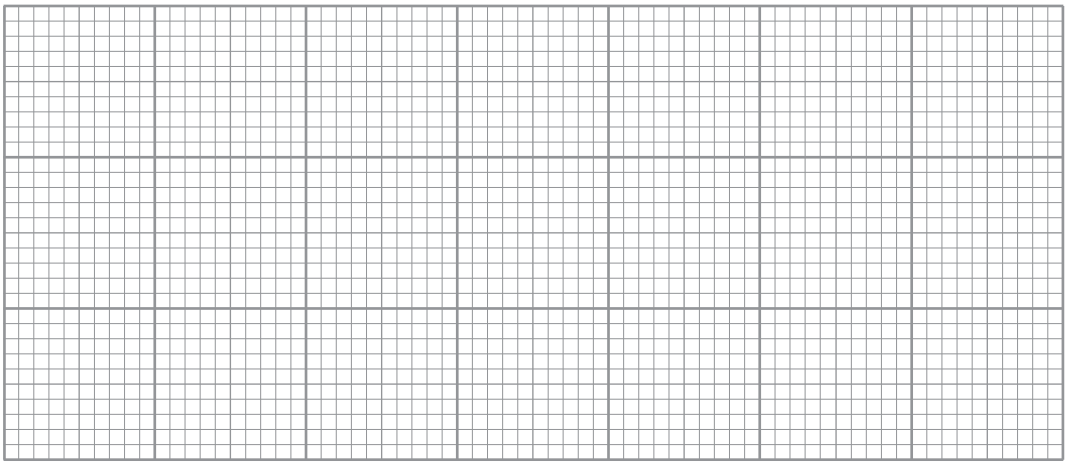
11. Gwen records the time she spends writing each of 240 text messages.
She finds the following.

- The greatest time is 1 minute 5 seconds.
- The range of the times is 60 seconds.
- The median is 45 seconds.
- The lower quartile is 23 seconds.
- The interquartile range is 32 seconds.

(a) Use the graph paper to draw a box-and-whisker diagram to represent Gwen's data. [5]



(b) How many of these text messages took Gwen more than 23 seconds to write? [2]

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..... text messages

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12. *(a)* There is a queue of 96 people waiting to buy concert tickets.

Liam has 8 vouchers to hand out, offering 20% off ticket prices.

He has decided to use a systematic sampling method to select who receives these 8 vouchers.

Liam has randomly selected the 6th person in the queue to receive the first voucher.

Use the table below to give the positions in the queue of the 8 people who would receive vouchers. [2]

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Voucher	1	2	3	4	5	6	7	8
Position in the queue	6th	.....	.....	.....	.....	.....	.....	.....

(b) Gerallt used his 20% off voucher to buy tickets.
He paid £120 for tickets using the voucher.
How much would these tickets have cost Gerallt without a voucher? [2]

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Cost without a voucher £ .....

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.	Examiner only

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