Candidate Name	Centre Number					Candidate Number				
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GCSE

MATHEMATICS - NUMERACY
UNIT 1: NON - CALCULATOR
INTERMEDIATE TIER

2nd SPECIMEN PAPER SUMMER 2017

1 HOUR 45 MINUTES

ADDITIONAL MATERIALS
The use of a calculator is not permitted in this examination. A ruler, protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES
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 in this booklet.

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.

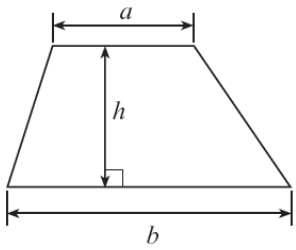
The number of marks is given in brackets at the end of each question or part-question.

The assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing in question **2*(c)*(i)**.

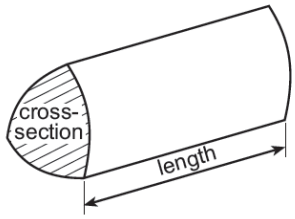
For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**5**	
2.	**9**	
3.	**4**	
4.	**5**	
5.	**5**	
6.	**6**	
7.	**4**	
8.	**9**	
9.	**2**	
10.	**4**	
11.	**7**	
12.	**8**	
13.	**4**	
14.	**8**	
TOTAL	**80**	

Formula list

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



Volume of a prism = area of cross section × length



1.

Ten people work at *Dragon Fitness*.
One of these people earns £1000 per week.
All the other 9 people earn the same weekly wage.
The mean wage for all of these 10 people is £280 per week.

(a) Complete the table below to show the different types of average weekly wage for these 10 people.

[4]

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Mean	Median	Mode
£280		

(b) Complete the following sentence and give a reason for your choice of mode, median or mean.

[1]

'The average wage of people working at *Dragon Fitness* is most typically £……'

Reason……

……..

2. Carys is planning a visit to Blaenau Ffestiniog tomorrow.
Carys lives in Rhyl and plans to travel by train.

She will need to travel by train from Rhyl to Llandudno Junction, then change train to travel on to Blaenau Ffestiniog.

Carys has collected the timetables she needs to plan her day out.

Going to Blaenau Ffestiniog:

Departs	From	To	Arrives	Duration
07:08	Rhyl	Llandudno Junction	07:28	20m
07:57	Rhyl	Llandudno Junction	08:16	19m
08:29	Rhyl	Llandudno Junction	08:51	22m
08:57	Rhyl	Llandudno Junction	09:16	19m
09:27	Rhyl	Llandudno Junction	09:43	16m
09:57	Rhyl	Llandudno Junction	10:16	19m

Departs	From	To	Arrives	Duration
07:39	Llandudno Junction	Blaenau Ffestiniog	08:42	1h 03m
10:28	Llandudno Junction	Blaenau Ffestiniog	11:30	1h 02m
13:30	Llandudno Junction	Blaenau Ffestiniog	14:32	1h 02m
16:33	Llandudno Junction	Blaenau Ffestiniog	17:35	1h 02m

Returning from Blaenau Ffestiniog:

Departs	From	To	Arrives	Duration
14:57	Blaenau Ffestiniog	Llandudno Junction	15:57	1h 00m
17:37	Blaenau Ffestiniog	Llandudno Junction	18:35	58m
20:23	Blaenau Ffestiniog	Llandudno Junction	21:21	58m

Departs	From	To	Arrives	Duration
16:18	Llandudno Junction	Rhyl	16:34	16m
16:25	Llandudno Junction	Rhyl	16:43	18m
17:15	Llandudno Junction	Rhyl	17:33	18m
17:37	Llandudno Junction	Rhyl	17:53	16m
18:39	Llandudno Junction	Rhyl	18:55	16m
18:53	Llandudno Junction	Rhyl	19:12	19m
19:26	Llandudno Junction	Rhyl	19:42	16m
19:51	Llandudno Junction	Rhyl	20:10	19m

(a) If Carys leaves Rhyl after 9 a.m., what is the earliest possible time at which she could arrive in Blaenau Ffestiniog? Circle your answer.

[1]

10:28 11:30 13:30 14:32 14:57

(b) Carys decides to leave Rhyl after 9 a.m.
She would like to spend the least time possible changing trains on her way to Blaenau Ffestiniog, so she selects the most suitable train.

How long will she have to wait for her connecting train to Blaenau Ffestiniog at Llandudno Junction station?
Circle your answer. [1]

12 minutes 16 minutes 19 minutes 45 minutes 1h 2 minutes

(c)(i) *You will be assessed on the quality of your organisation, communication and accuracy in writing in this part of the question.*

Carys plans to be at the railway station in Blaenau Ffestiniog by 5 p.m. to begin her return journey home.
How much time, in hours and minutes, will it take to travel back (from the time she leaves Blaenau Ffestiniog to the time she arrives back at Rhyl station)?
[4 + OCW 2]

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(ii) Delays on the Blaenau Ffestiniog to Llandudno Junction railway line are expected tomorrow.
A delay may cause Carys to miss her connecting train on the way home.
If this happens, at what time will Carys arrive back at Rhyl station?
You may assume that Carys misses only one train.
Circle your answer.

18:35 21:21 18:55 19:12 19:42

Explain how you decided on your answer. [1]

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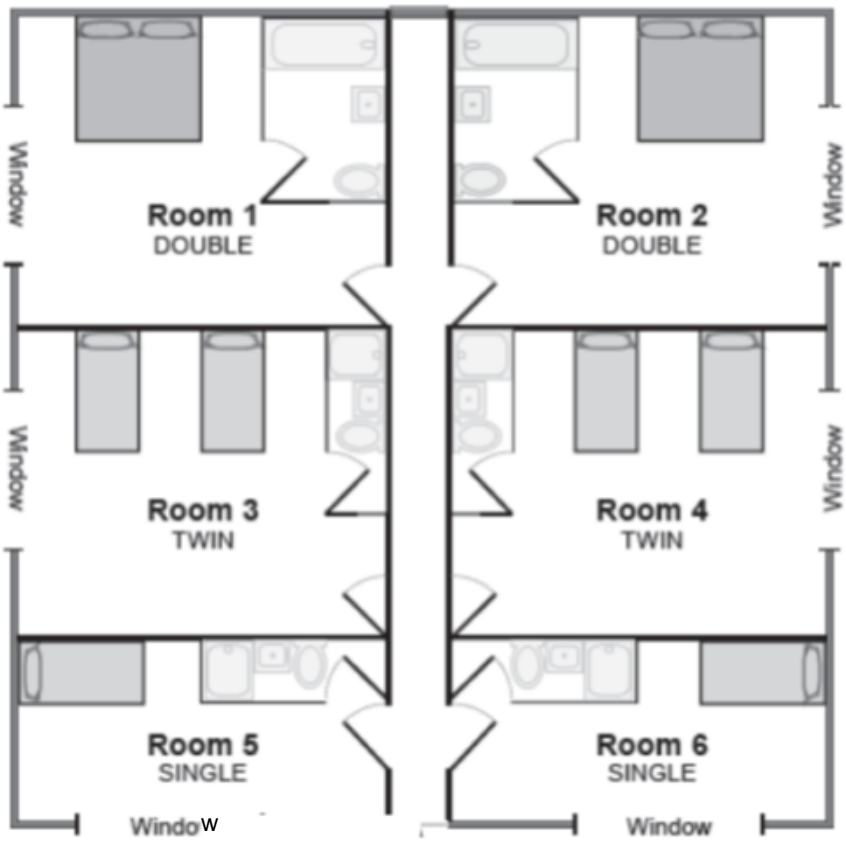
3. *Gwesty Traeth* is a guest house and has six bedrooms.

Two of the rooms are described as *Double* (they have a double bed).
Two of the rooms are described as *Twin* (they have two single beds).
Two of the rooms are described as *Single* (they have one single bed).

The diagram below shows a plan of these rooms.



The people listed below have contacted *Gwesty Traeth* requesting rooms for dates in July 2016.

- Sasha and Mia want to share a twin room for the 6th and 7th.
- Mr & Mrs Jones want a double room for the 5th.
- Flavia wants a single room for the 5th and 6th.
- Mr & Mrs Evans want a double room for themselves and a twin room for their sons, Morys and Ifan, to share for the three nights 5th, 6th and 7th.
- Their daughter Heledd will join them on the 6th and 7th, and she requires a single room.
- Mr & Mrs Igorson want a double room for the 6th and 7th.

Use the table below to show who is given which room for each of the dates from the 5th July until the 7th July.
No-one should have to change rooms during their stay.

[4]

	Room 1	**Room 2**	**Room 3**	**Room 4**	**Room 5**	**Room 6**
5th July						
6th July						
7th July						

4. Thomas buys a number of items from a market stall with two £20 notes and one £10 note.

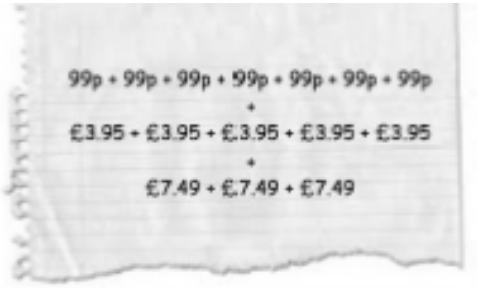
These are the items Thomas buys:

7 cereal bars at 99p each

5 pairs of socks at £3.95 each

3 sweaters at £7.49 each

Thomas waits for the owner of the market stall to list all the items he has selected.



The owner then uses a calculator to add these costs individually and gives Thomas 75p change.

(a) Without the use of a calculator, how could Thomas check the calculation by using an efficient method?
You must show all your working.

[4]

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(b) Did Thomas receive the correct change? If not, state the correct amount.

[1]

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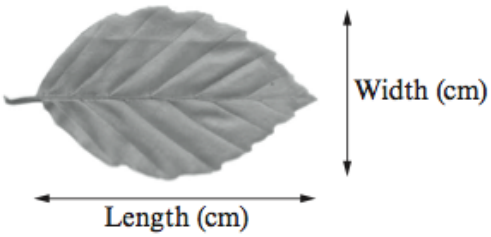
5. Billy and Shaun both completed a survey.
They collected leaves from a number of trees and decided to measure them.

They agreed on the following decisions

- The length of the leaf does not include the stem
- The width of the leaf is measured at the widest section of the leaf



(a) Why have they both agreed on these decisions about measuring the leaves? [1]

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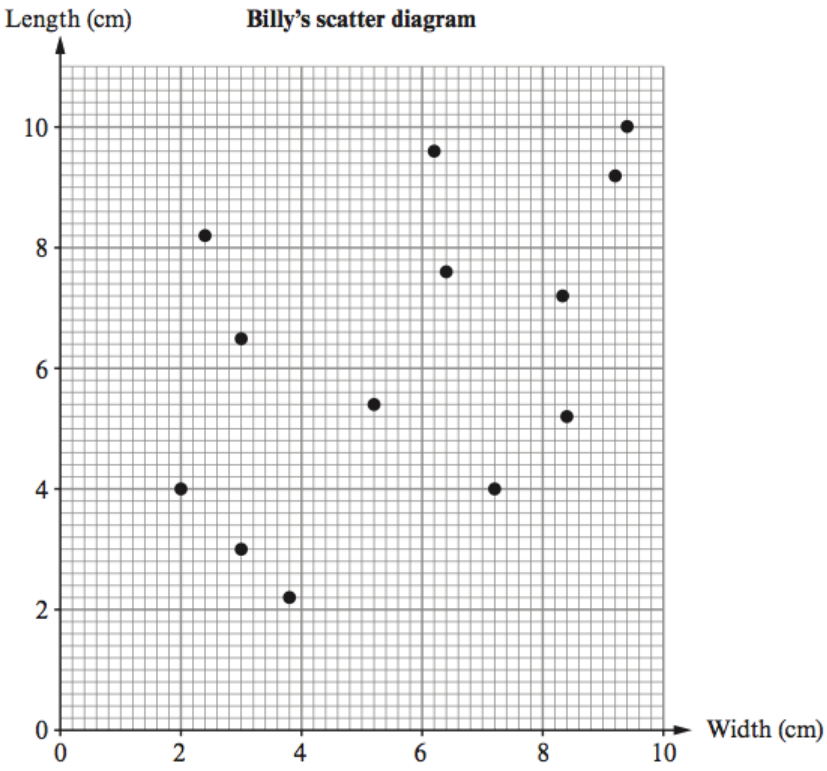
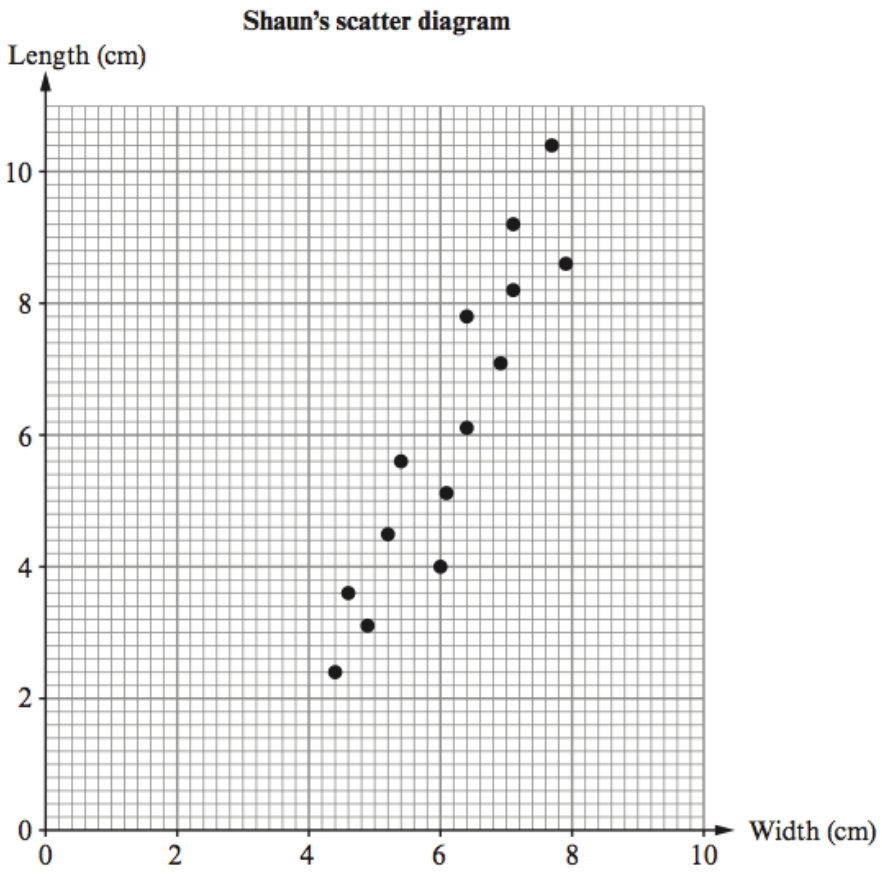
(b) Billy measured the length and width of each leaf he had collected.
Shaun did the same with his leaves.
They displayed the lengths and widths of their own leaves on separate scatter diagrams.
Billy's scatter diagram is shown below and Shaun's scatter diagram is shown opposite.





(i) Who found the longest leaf? …….

Write down the length of this leaf. ..... cm

[1]

(ii) Only one of the two boys collected all his leaves from the same tree.
Who was this, Billy or Shaun? Give a reason for your answer.

[1]

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(iii) Draw, by eye, a line of best fit on Shaun's scatter diagram.

[1]

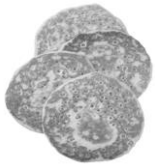
(iv) Shaun realises he has one more leaf that he has not included on his scatter diagram.
The leaf is damaged in such a way that Shaun cannot measure its width.
The length of the leaf is 8·5 cm.
Write down a reasonable estimate for the width of this leaf.

Width ……. cm

[1]

6.

Ingredients to make **4 pancakes**



55 g plain flour
1 egg
100 ml milk
37·5 ml water
25 g butter

Useful information: metric and imperial units

4 ounces is approximately 110 g
25 ml of milk or water is approximately 1 fluid ounce

(a) Using the recipe shown above, calculate the quantity of plain flour needed to make 48 pancakes. **Give your answer in ounces**.

[3]

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(b) Owen works in a school kitchen.
He uses the recipe information for pancakes shown above.
He has measured out the plain flour, milk and butter and placed them with the eggs in a large bowl.
Owen measures out 150 fluid ounces of water to add to his other pancake ingredients in the bowl.
How many pancakes is Owen making?

[3]

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7. In a supermarket, the same brand of shampoo is sold in two different-sized bottles.

Large bottle 800 ml for £1.28

Small bottle 300 ml for 45p

Which bottle of shampoo offers the better value for money?
You must show your working and give a reason for your choice.

[4]

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8. Derek works for a company which designs and fits kitchen cupboards.
Kitchen cupboards and worktops are usually measured in mm.

(a)(i) A worktop is 4500 mm long.
How much is this in metres?

[1]

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(ii) A rectangular worktop needs to be covered in a special varnish.
The worktop measures 3000 mm long by 700 mm wide.
Calculate the area of the top surface of the worktop in m^2.

[2]

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(b) A kitchen cupboard is in the shape of a cuboid.
Its capacity is 420 000 cm^3.
Internally, the cupboard measures 60 cm wide and 70 cm deep.
Calculate the internal height of the cupboard in cm.

[2]

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(c) A kitchen worktop measures 301 cm, **correct to the nearest 1 cm**.

Derek needs to fit two of these worktops together along a wall measuring 605 cm, **correct to the nearest 5 cm**.
Unfortunately, he finds that the worktops do not fit.

Explain why this might have happened, and state the greatest possible difference between the lengths of the wall and the two worktops.

[4]

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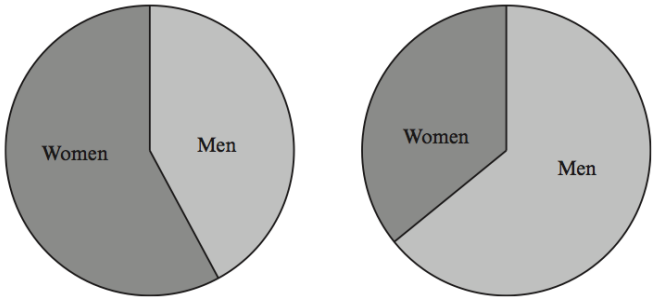
9.*(a)* Lucy has been given pie charts showing the number of computers sold by 2 different companies.

RG computers *LF computers*



Lucy says

'More men buy RG computers than LF computers.'

Explain how this could be true. [1]

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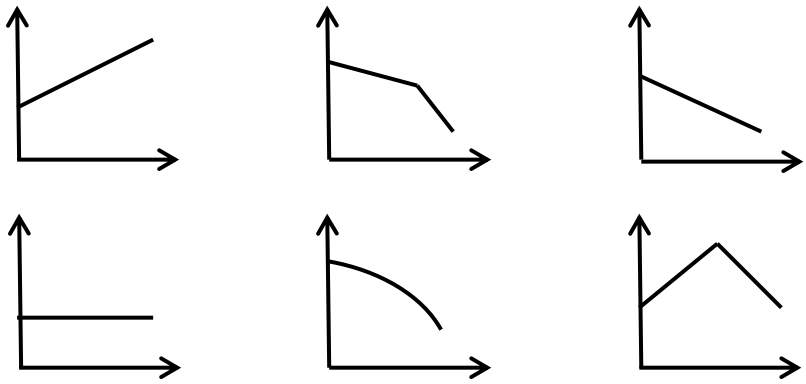
(b) Lucy sees a headline.

Sales of desktop computers are steadily falling.

A graph was printed under this headline.
Which of the following graphs was it most likely to have been?
Circle your answer. [1]



10. Coffee is often sold in a carton.
The height of one coffee carton is 13·4 cm.

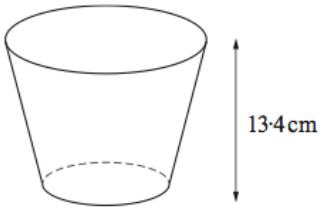


Diagram not drawn to scale

A stack of 4 empty coffee cartons is shown below.

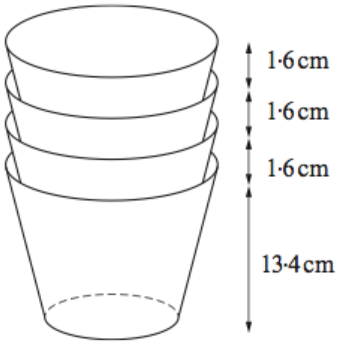


Diagram not drawn to scale

(a) What is the total height of a stack of 21 coffee cartons?
Circle your answer. [1]

32 cm 33·34 cm 33·6 cm 45·4 cm 47 cm

(b) The height of a stack of x coffee cartons is 61·4 cm.
By forming an equation, or otherwise, calculate the number of coffee cartons in the stack.

[3]

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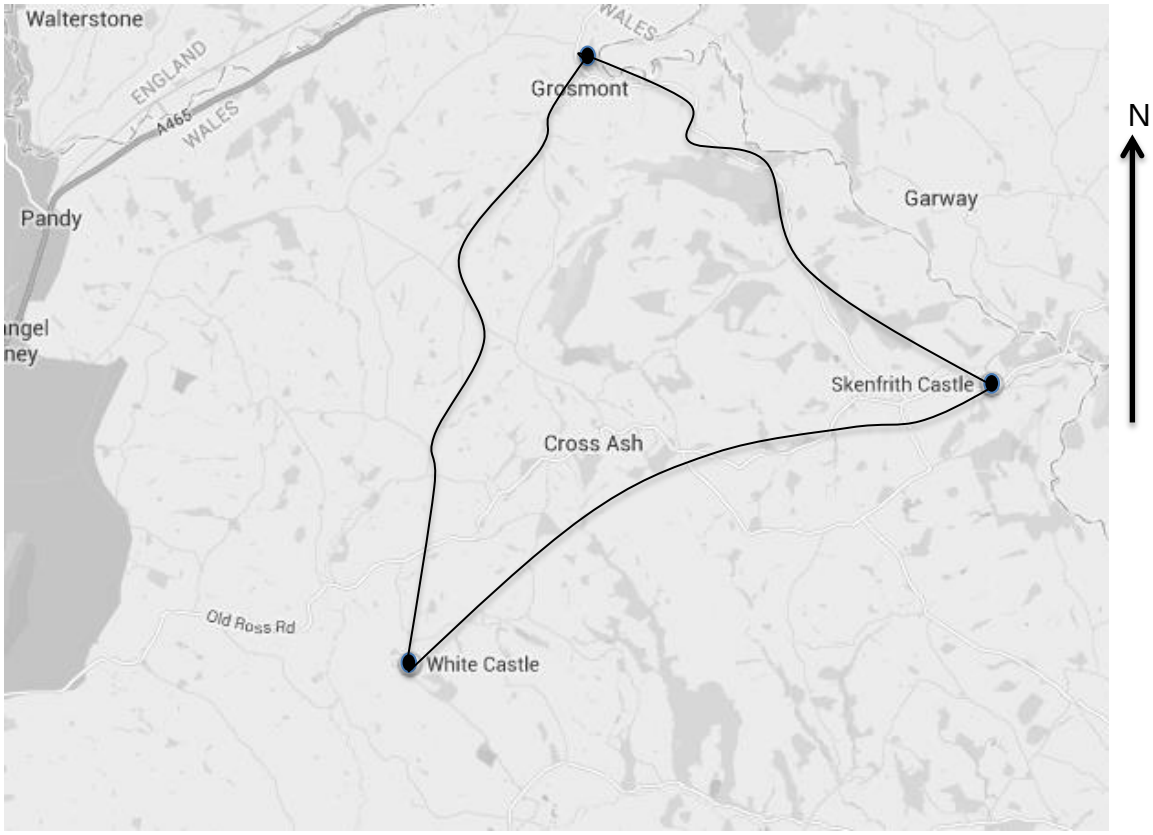
11. The three Welsh castles, shown below, are all within walking distance of each other.

White Castle

Skenfrith Castle

Grosmont Castle

These castles are shown on the map below.
The black lines represent the **footpaths** between the castles.



(a) **By road**, White Castle is 11 km from Skenfrith Castle.
Complete the sentence below.

The map scale is approximately 1 cm to represent …… km.

[3]

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(b) Complete the following statements.

The bearing of Skenfrith Castle from White Castle is ..... °

The bearing of White Castle from Grosmont Castle is ..... °

[2]

(c) Treasure has been buried at a position *X.*
X is the position that meets both the following criteria:

- *X* is equidistant from Grosmont Castle and Skenfrith Castle.
- *X* is equidistant from White Castle Castle and Skenfrith Castle.

Find the treasure by marking *X* on the map.

[2]

12. Yolanda and Emyr set up a gardening business together.
They decide to calculate the charge for the time that they spend on a gardening job using the following method.

Gardening by Yolanda and Emyr

- START with a standard charge of £15
- ADD a fee of £10 for every **complete** hour worked
- ADD an additional fee of 20p for every **additional minute** worked
- MULTIPLY the total charge so far by 2
- EQUALS the final charge

(a) Calculate the charge for a gardening job that takes $2\frac{1}{4}$ hours.

[2]

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(b) (i) The fourth bullet point in calculating the charge reads:

- MULTIPLY the total charge so far by 2.

Why do you think this is included in Emyr and Yolanda's method for calculating a charge for gardening?

[1]

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(ii) Write a formula for working out the final charge, £T, for gardening that takes h hours and m minutes.

[3]

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(c) Yolanda notices that there is a problem with the method for calculating the charge.
They spent 2 hours on gardening for Mr Rees, and 1 hour 55 minutes gardening for Ms Elmander.

Mr Rees paid less than Ms Elmander.
Explain why this happens.

[2]

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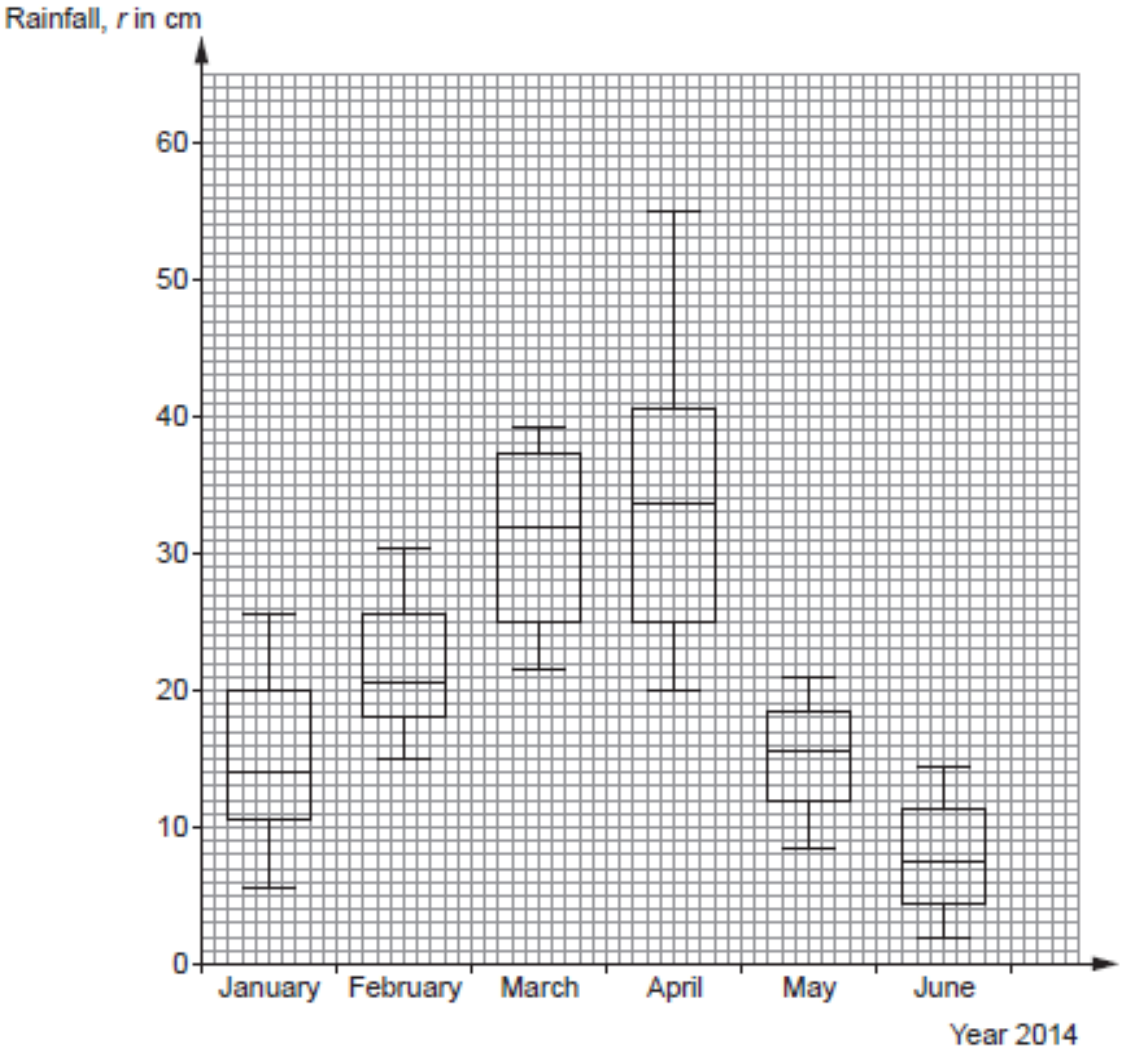
13. The information shown below was found in a holiday brochure for a small island.



The information shows monthly data about the rainfall in centimetres.

(a) Looking at the rainfall, which month had the most changeable weather?
You must give a reason for your answer.

[1]

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(b) Circle either TRUE or FALSE for each of the following statements.

[2]

If you don't want much rain, the time to visit the island is in June.	TRUE	FALSE
The greatest difference in rainfall is between the months of February and March	TRUE	FALSE
The interquartile range for May is approximately equal to the interquartile range for June.	TRUE	FALSE
The range of rainfall in February was approximately 15 cm.	TRUE	FALSE
During June, there were more days with greater than 7·5 cm of rainfall than there were days with less than 7·5 cm of rainfall.	TRUE	FALSE

(c) In July 2014, the interquartile range for the rainfall was 10 cm and the range was 40 cm.
Is it possible to say whether July has more or less rainfall than June?
You must give a reason for your answer.

[1]

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14. Two different European Political Parties are proposing changing the rules for income tax payments for the tax year April 2018 to April 2019.

Income Tax proposed by the **Yellow Party**

April 2018 to April 2019

taxable income = gross income – personal allowance

- **personal allowance is €5000**
- **basic rate of tax 10% on the first €10 000 of taxable income**
- **middle rate of tax 25% is payable on all taxable income over €10 000 and up to €30 000**
- **higher rate tax 50% is payable on all taxable income over €30 000**

Income Tax proposed by the **Orange Party**

April 2018 to April 2019

taxable income = gross income – personal allowance

- **personal allowance is €10 000**
- **basic rate of tax 20% on the first €20 000 of taxable income**
- **higher rate tax 40% is payable on all other taxable income**

(a) During the tax year 2018 to 2019, Janina's gross income is likely to be €55 000.

Which party's tax proposal would result in Janina paying the least tax, and by how much?

You must show all your working

[7]

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(b) Samuli plays rugby for an international team.
He is likely to earn €200 000 during the tax year 2018 to 2019.
Without any calculations, explain why Samuli might favour the Orange Party's proposal for income tax.

[1]

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END OF PAPER