Candidate Name	Centre Number	Candidate Number
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WJEC CBAC

GCSE

MATHEMATICS - NUMERACY

UNIT 1: NON-CALCULATOR INTERMEDIATE TIER

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 **4**.

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

Formula list

Area of a trapezium = $\dfrac{1}{2}(a+b)h$
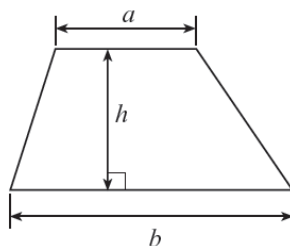
Volume of a prism = area of cross section × length
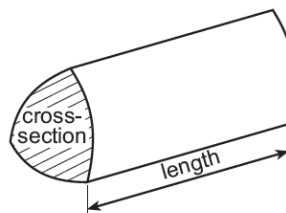
1.   Martina walks **650 metres due North**.

       She then turns **right through an angle of 37°** and then walks a further **500 metres in a straight line.**

       Using a scale of **1cm to represent 100 m**, draw an accurate scale drawing to show the above information.
       The starting point is given.

       Use your completed drawing to find the actual distance Martina is away from her starting point.   [4]

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                           Start •

       Actual distance from the starting point = ...

2.   The travel graph below illustrates Robbie's journey to and from school one day.

Distance from Robbie's house (miles)
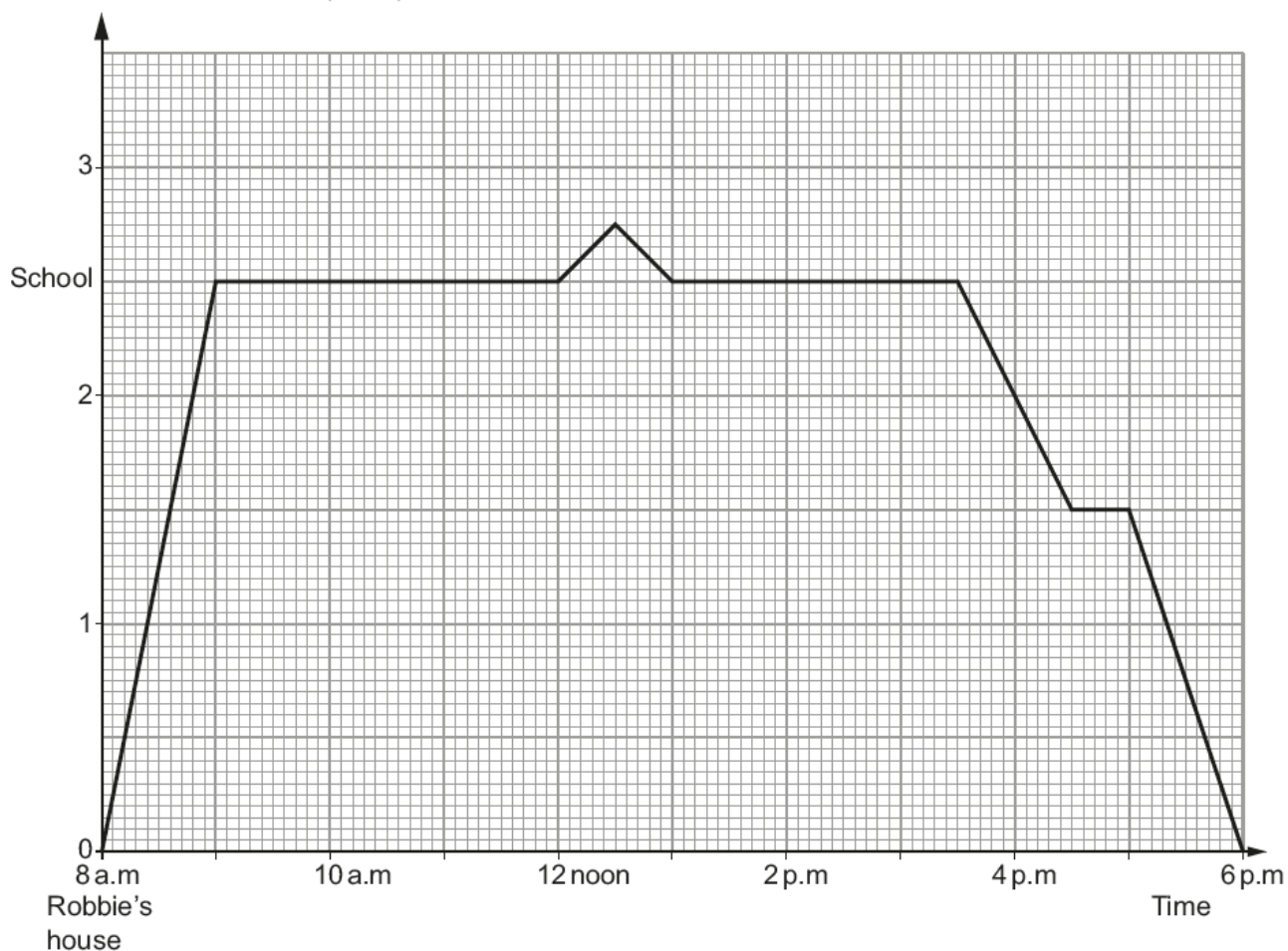
(a)   (i)   At what time did Robbie arrive at school?
                  Circle your answer.   [1]

8:00 a.m.   8:30 a.m.   3:30 p.m.   8:50 a.m.   9:00 a.m.

        (ii)   At what time was Robbie furthest away from his house?
                  Circle your answer.   [1]

12:15 p.m.   6 p.m.   12:30 p.m.   3:30 p.m.   12 noon

(iii)   Which one of the following statements is correct?
          Circle your answer.   [1]

          A Robbie's average speed was greater between 8 a.m. and 9 a.m.
          than it was between 5 p.m. and 6 p.m.

          B Robbie's average speed was the same between 8 a.m. and 9 a.m.
          as it was between 5 p.m. and 6 p.m.

          C Robbie's average speed was less between 8 a.m. and 9 a.m. than it
          was between 5 p.m. and 6 p.m.

          D It is not possible to tell anything about Robbie's average speed
          between 8 a.m. and 9 a.m. or between 5 p.m. and 6 p.m. from the
          information given.

(b)   The travel graph shown is correct.
          Robbie is 11 years old and tells his teacher,

          'I walked to school, but actually had to run fast for the last 15 minutes to
          get there on time.'

          'I didn't leave the school classroom all day'.

          For each of Robbie's statements, decide whether he was telling the truth or
          not.
          You must give a reason for each of your answers below:

          (i)   'I walked to school but I ran for the last 15 minutes.'

                   Is this true? Put a tick in the box: Yes ☐ No ☐   [1]
                   Reason:

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          (ii)   'I stayed in the classroom all day.'

                   Is this true? Put a tick in the box: Yes ☐ No ☐   [1]
                   Reason:

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3. *Dragon CarCare* is a car cleaning company.

Dragon CarCare is charged the following costs for products and services.

Car cleaning products	Costs
Car wash liquid	£1 per 5 litre bottle
Window spray	£2 per 2 litre bottle
Wax	£2.50 per 2 litre drum
Cloths and sponges	10 p each

Service	Unit cost
Water	£2 per m^3 + Standing charge £4 per month
Electricity	25p per kWh + Standing charge £10 per month + 5% VAT

During June *Dragon CarCare* used the following quantities of products.

Car cleaning products	Quantity used
Car wash liquid	12 bottles
Window spray	8 bottles
Wax	6 drums
Cloths and sponges	100 cloths + 100 sponges

At the beginning and at the end of June, the meter readings for water and electricity were recorded.

Service	Time: 00:01 Date: 1 June 2014 Meter reading	Time: Midnight Date: 30 June 2014 Meter reading
Water	3450 m^3	3950 m^3
Electricity	3000 kWh	3800 kWh

(a) How much did *Dragon CarCare* spend on car cleaning products in June 2014? [3]

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(b) Calculate the total cost of the water and electricity used by *Dragon CarCare* during June 2014. [4]

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(c) The operating costs for *Dragon CarCare* is the sum of the water costs, the electricity costs and the cost of the products used.

Calculate the operating costs for *Dragon CarCare* for June 2014 [1]

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

Sam and Laura own $\frac{3}{4}$ of the company *Dragon CarCare*.

They each own $\frac{1}{2}$ of this $\frac{3}{4}$ share.

It cost a total of £8000 to set up the original business.
This set-up cost was paid in proportion to the share each person has in the business.
After 6 months, Laura received £3200 as her share of the profits so far.

Did Laura make a profit on her original investment or did she make a loss?

You must show all your working and state how much profit or loss Laura made.

[6]

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5.   Hari lives in Chester.
He wanted to catch the ferry to Ireland, leaving Holyhead at 12:05 p.m.
Passengers must board the ferry at least 30 minutes before sailing time.

In planning his journey, he allowed himself 20 minutes to travel from the station at Holyhead to the ferry.
He wanted to catch the latest possible train from Chester to be sure of arriving on board the ferry in time.

Part of the train timetable he used is shown below.

Chester (depart)	07:19	08:55	09:58	10:24
Holyhead (arrival)	09:22	10:35	11:22	12:23

Hari caught the train he wanted, and the train arrived at Holyhead station on time.
The time to travel from the station to the ferry took a total of 25 minutes.

Calculate the total time taken between Hari departing from Chester and arriving at the ferry.   [4]

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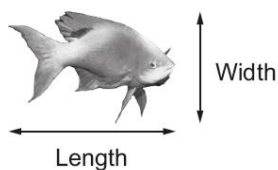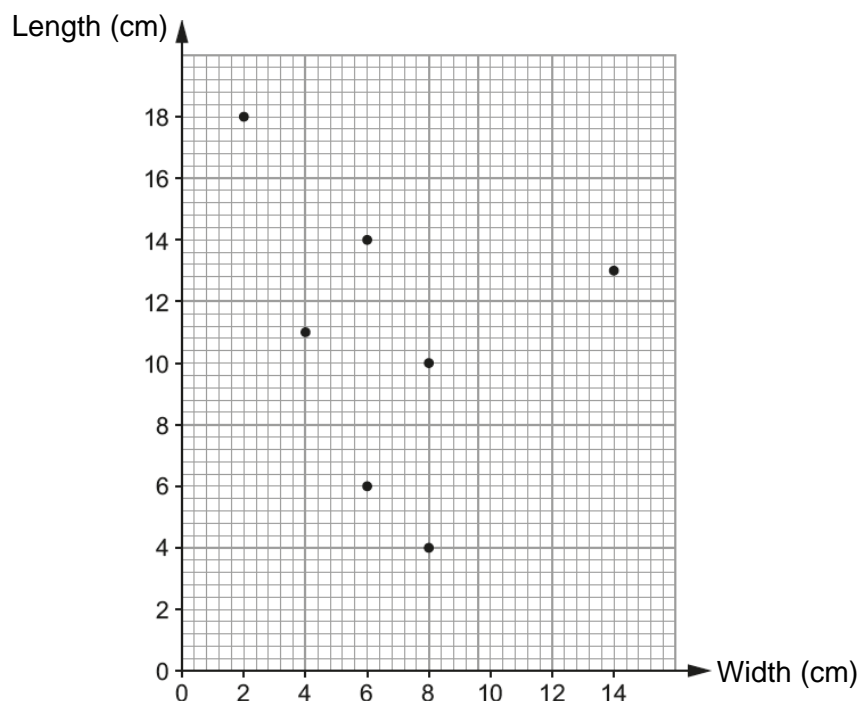
Time taken = ...

6.   Nerys takes her 3 cousins, Ben, Elwyn and Denny, to an aquarium in North Wales.

(a)   Denny records estimates for the length and width of some of the fish he sees at the aquarium.

He draws a scatter diagram as shown below.

(i)   One of the fish is 4 cm wide.
Write down its length.   [1]

……………………………… cm

(ii)   Another fish is 14 cm long.
Write down its width.   [1]

……………………………… cm

(iii)   The width of a yellow fish is exactly the same as its length.
Indicate on the scatter diagram which point you think represents the yellow fish.   [1]

(b)

Remember:

14 pounds = 1 stone
1 kg ≈ 2·2 pounds
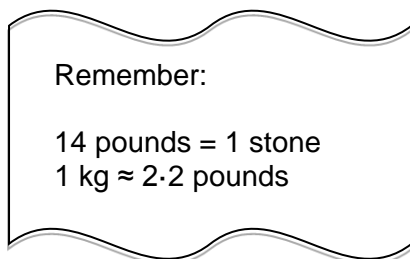
Nerys sees a very big fish.

She is told it weighs 15 kg.

Nerys herself weighs 9 stone 4 pounds.

Complete the following sentence. [6]

   Nerys weighs approximately ……………………… times as much as the fish.

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7.   200 visitors to Cardiff completed a questionnaire.

All 200 visitors had visited at least one of the following attractions: Cardiff Castle, the Millennium Stadium and Cardiff Bay.
25 of the visitors had visited Cardiff Castle and the Millennium Stadium and, of these, 15 had visited all three attractions.
91 of the visitors had visited the Millennium Stadium.
88 had visited Cardiff Castle.
101 had visited Cardiff Bay.
Some further information is given on the Venn diagram below.

How many visitors had visited the Millennium Stadium but not Cardiff Castle or Cardiff Bay?   [5]

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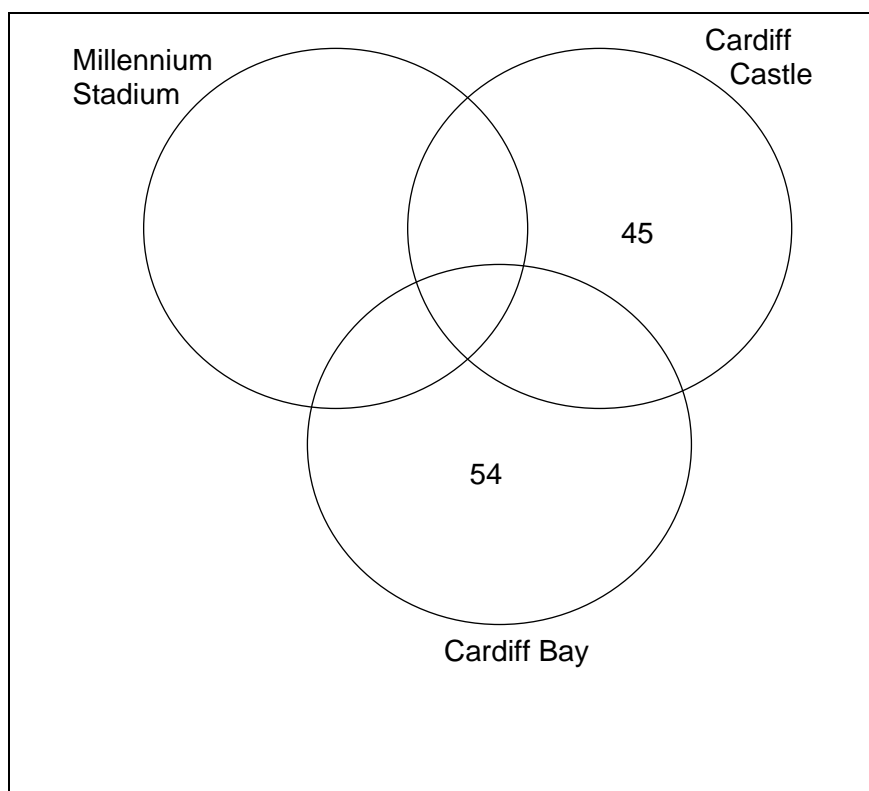
   …………. visitors had visited the Millennium Stadium but not Cardiff Castle or Cardiff Bay.

8. A magazine article states:

Each year one third of the world's whale population migrates around the North West coast of Scotland.
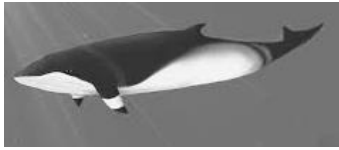
A Minke whale is sighted by a number of people in a sea area near North Minch

In attempting to locate the Minke whale, the following details are known.

- The distance from Muir of Ord to Dingwall is 10 miles.
- The whale is
    - equidistant from Stornoway and Ullapool,
    - within 30 miles of Portree,
    - further than 10 miles off shore.

(a) Use the map on the next page to indicate possible locations of the sighting of the Minke whale.
You must show all your constructions and working.   [5]

(b) Complete the following sentence to give the range of possible bearings of the Minke whale from Stornoway.   [2]

The bearing of the Minke whale from Stornaway is between

……………… ° and ……………… °.
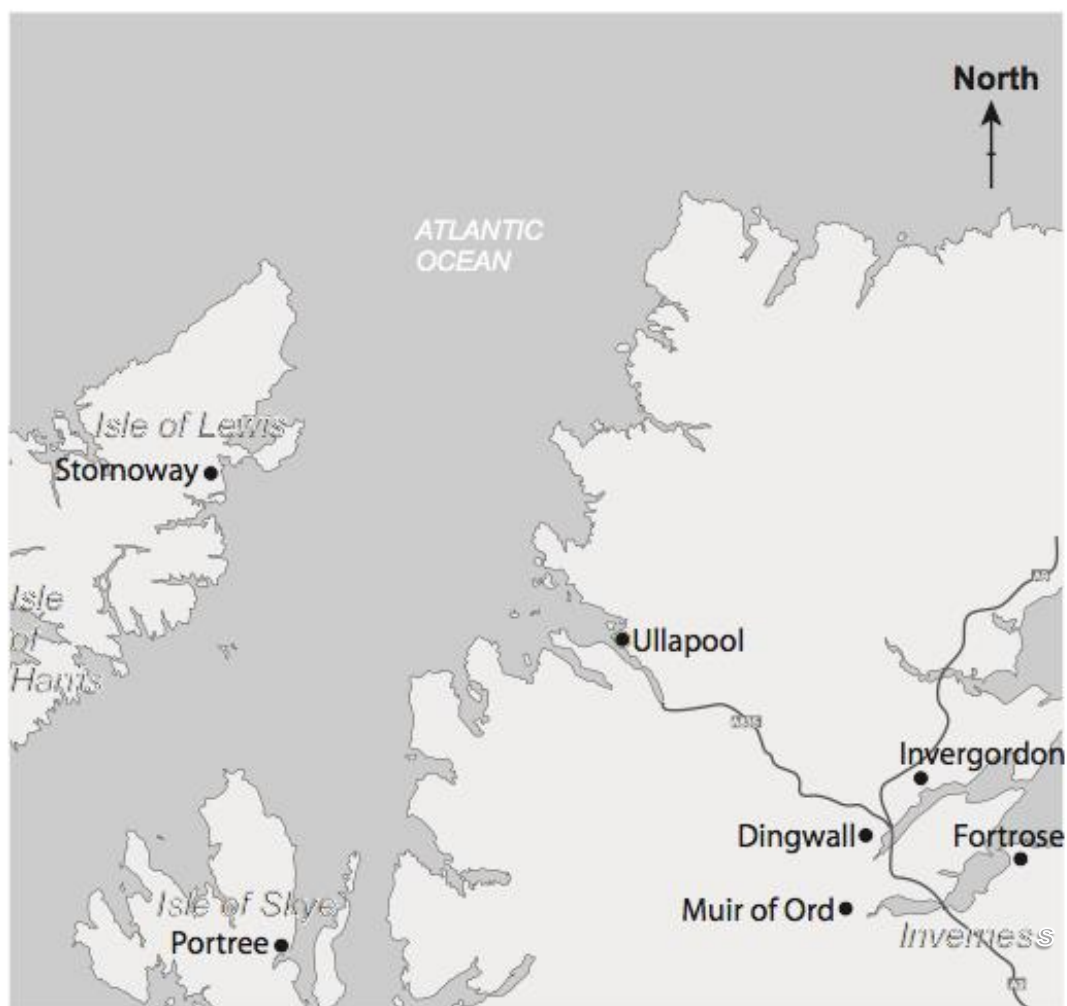
9.   The *Hafod Hotel* swimming pool is currently in need of improvement.

Horizontal rectangular surface of the swimming pool

Shallow end of the swimming pool
with vertical side

Deep end of the swimming pool
with vertical side
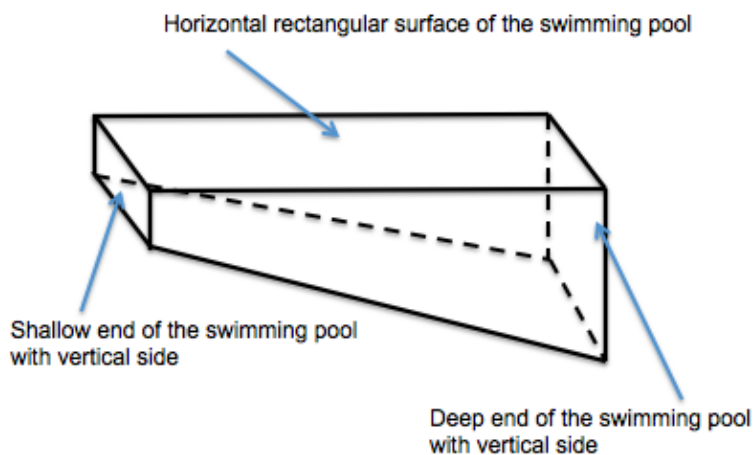
Diagram not drawn to scale

(a)   The pool is 1 metre deep at the shallow end, dropping to 3 metres deep at the other end.
The width of the pool is 10 metres and the length is 20 metres.
The length of the sloping floor of the pool is 20·1 metres.

The four walls and the floor within the pool are to be covered in tiles.
This will cost £20 per m^2.

The labour cost of fixing the tiles is £150 per day.
It should take 6 days to tile the pool.

Calculate how much it will cost the hotel to tile the swimming pool.   [8]

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(b)   Before agreeing to improve the hotel's swimming pool, the manager of the *Hafod Hotel* decides to check the price of a double room for a night, in hotels with and without swimming pools.

She has grouped her results, 120 hotels with a swimming pool and 120 hotels without a swimming pool.

Prices for double rooms at hotels with a swimming pool
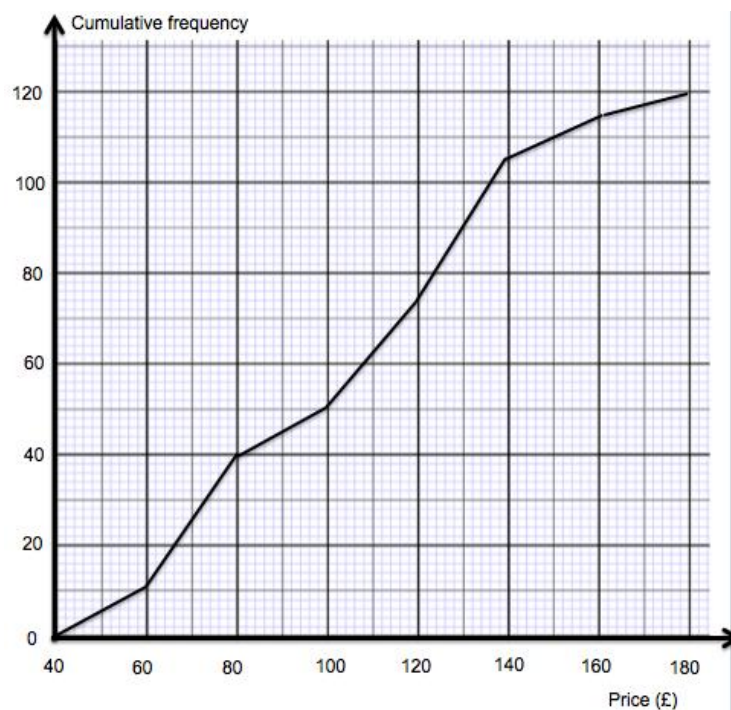
Prices for double rooms at hotels without a swimming pool

(i)   The *Hafod Hotel* owners look at the manager's findings and ask:

> How many more hotels have double rooms that are priced at more than £140 per night in hotels with swimming pools than in hotels without swimming pools?
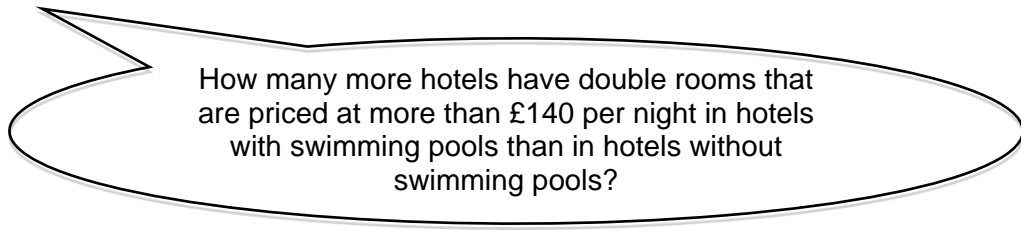
What response should the manager give?
You must show all your working.   [2]

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(ii)   To help decide whether or not to improve the *Hafod Hotel's* swimming pool, the manager's findings need to be interpreted.

Describe the difference in the distribution of prices for a double room in hotels with a swimming pool compared with those without a swimming pool.

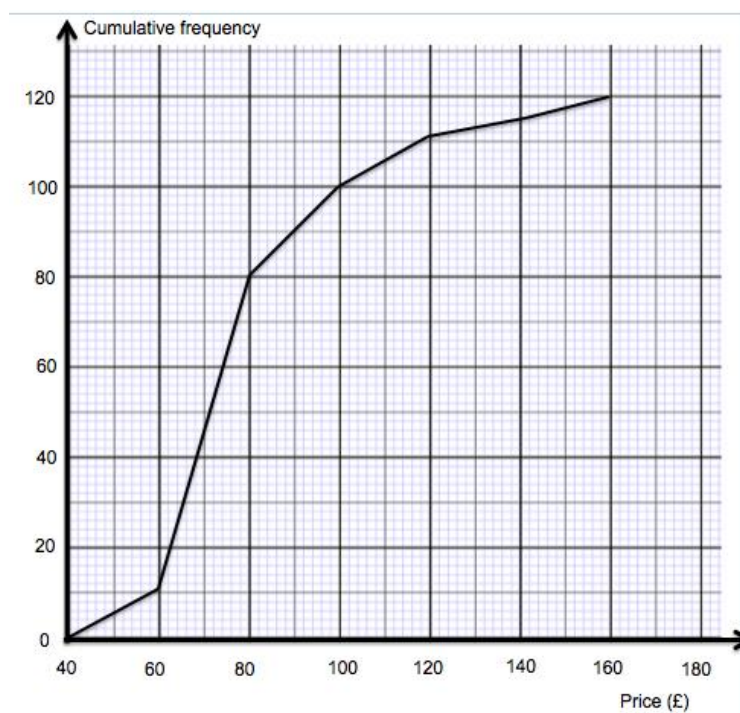You must use an appropriate average and measure of spread and interpret your findings.   [4]

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10. The Royal Mint in Llantrisant in South Wales is the body permitted to manufacture the coins of the United Kingdom.

(a) In March 2013, the Royal Mint estimated the number of coins in circulation.

Coin	Number of coins in circulation (in millions)
£2	394
£1	1526
50p	920
20p	2704
10p	1598
5p	3813
2p	6600
1p	11 293

One particular coin is selected.
The total **value** of the coins in circulation of this selected coin was greater than for any other coin.
Which coin was selected?
Circle your answer. [1]

£2 coin   £1 coin   50p coin   10p coin   1p coin

(b) Hari has a gold coin.
It weighs 8g.
What does this weigh in kg?
Circle your answer. [1]

8×10^3 kg 8×10^{-2} kg 8×10^{-3} kg 8^{-2} kg 8^{-3} kg

(c) How many of these coins could the Royal Mint possibly make from a gold bar weighing 2460g?
Circle your answer. [1]

30   307   310   308   3075

(d) Another gold bar has a mass of 3·86 kg and a volume of 200 cm³.

Calculate the density, in g/cm³, of the gold in the bar. [3]

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11. In a factory, Machine A is three times as quick as Machine B in assembling identical circuit boards.
Machine A is allocated two and a half times as many of these circuit boards to assemble as Machine B.

Machine B took 4 hours to assemble all of its allocation.

How long did it take for Machine A to complete its allocation?
Give your answer in hours and minutes. [4]

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12. The box-and-whisker plot shows information about the height, in feet, of waves measured at a beach on a particular day.
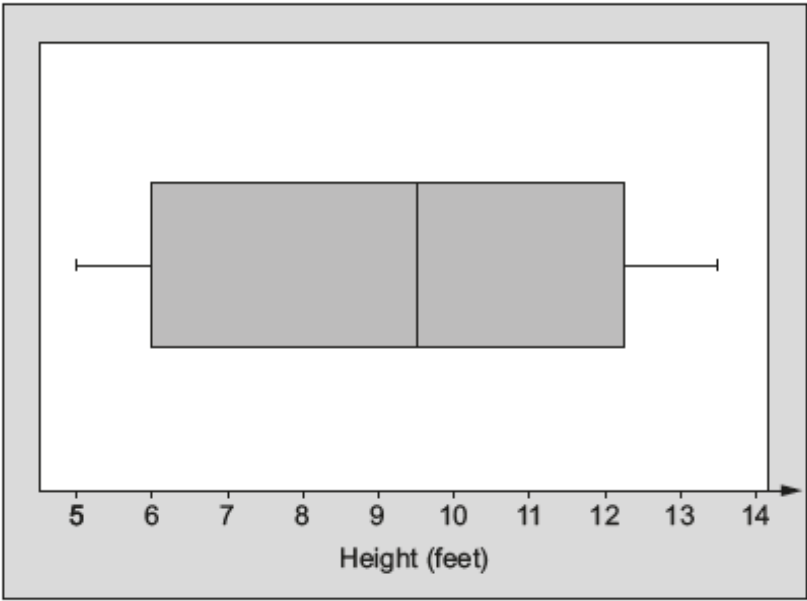
(a) About what fraction of the waves measured were less than 6 feet? [1]

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(b) Circle either TRUE or FALSE for each of the following statements. [2]

The smallest wave measured was 5 feet.	TRUE	FALSE
The range of the heights of the waves measured was 6·5 feet.	TRUE	FALSE
Approximately a half of the waves measured were more than 9·5 feet.	TRUE	FALSE
Approximately a quarter of the waves measured were between 6 feet and 9·5 feet.	TRUE	FALSE
The biggest wave measured was 12·25 feet.	TRUE	FALSE

13. Ffion has organised a conference in the *Hafod Hotel*.
The hotel has given Ffion a graph to illustrate the costs for room hire with
refreshments for different numbers of people.
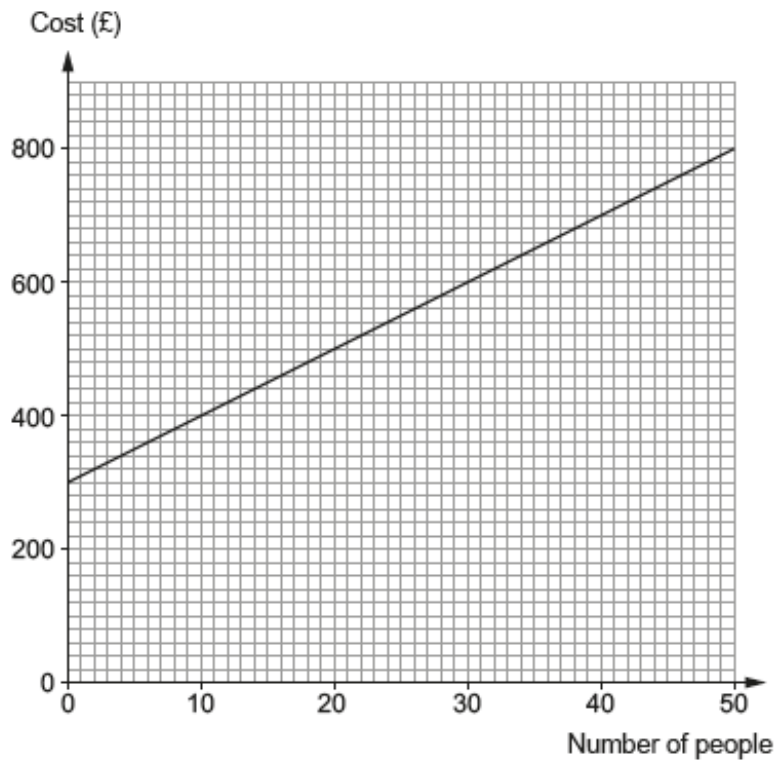
(a)   (i)   Calculate the gradient of the straight line graph.   [2]

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      (ii)   Explain what the gradient tells you about the conference costs.   [1]

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      (iii)   The straight line graph intersects the vertical axis at £300.
           Explain what this tells you about the conference costs.   [1]

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(b) 20 more people arrived at the conference than Ffion had expected.
The hotel prepared extra food and set out more chairs in the conference room.
Calculate how much **extra** Ffion has to pay the hotel. [1]

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