

| Candidate Name | Centre Number | | | | | Candidate Number | | | | |
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| Mel@JustMaths | | | | | | 0 | | | | |

SOLUTIONS



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.

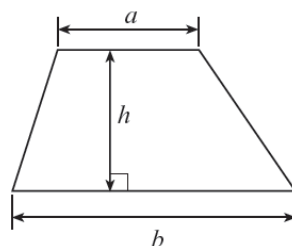
The number of marks is given in brackets at the end of each question or part-question.

The assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing in question 4.

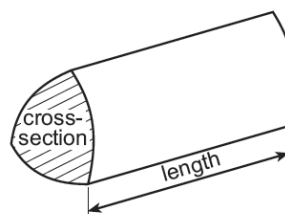
| For Examiner's use only | | |
|-------------------------|--------------|--------------|
| Question | Maximum Mark | Mark Awarded |
| 1. | 4 | |
| 2. | 5 | |
| 3. | 8 | |
| 4. | 6 | |
| 5. | 4 | |
| 6. | 9 | |
| 7. | 5 | |
| 8. | 7 | |
| 9. | 14 | |
| 10. | 6 | |
| 11. | 4 | |
| 12. | 3 | |
| 13. |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

Formula list

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



Volume of a prism = area of cross section \times 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.

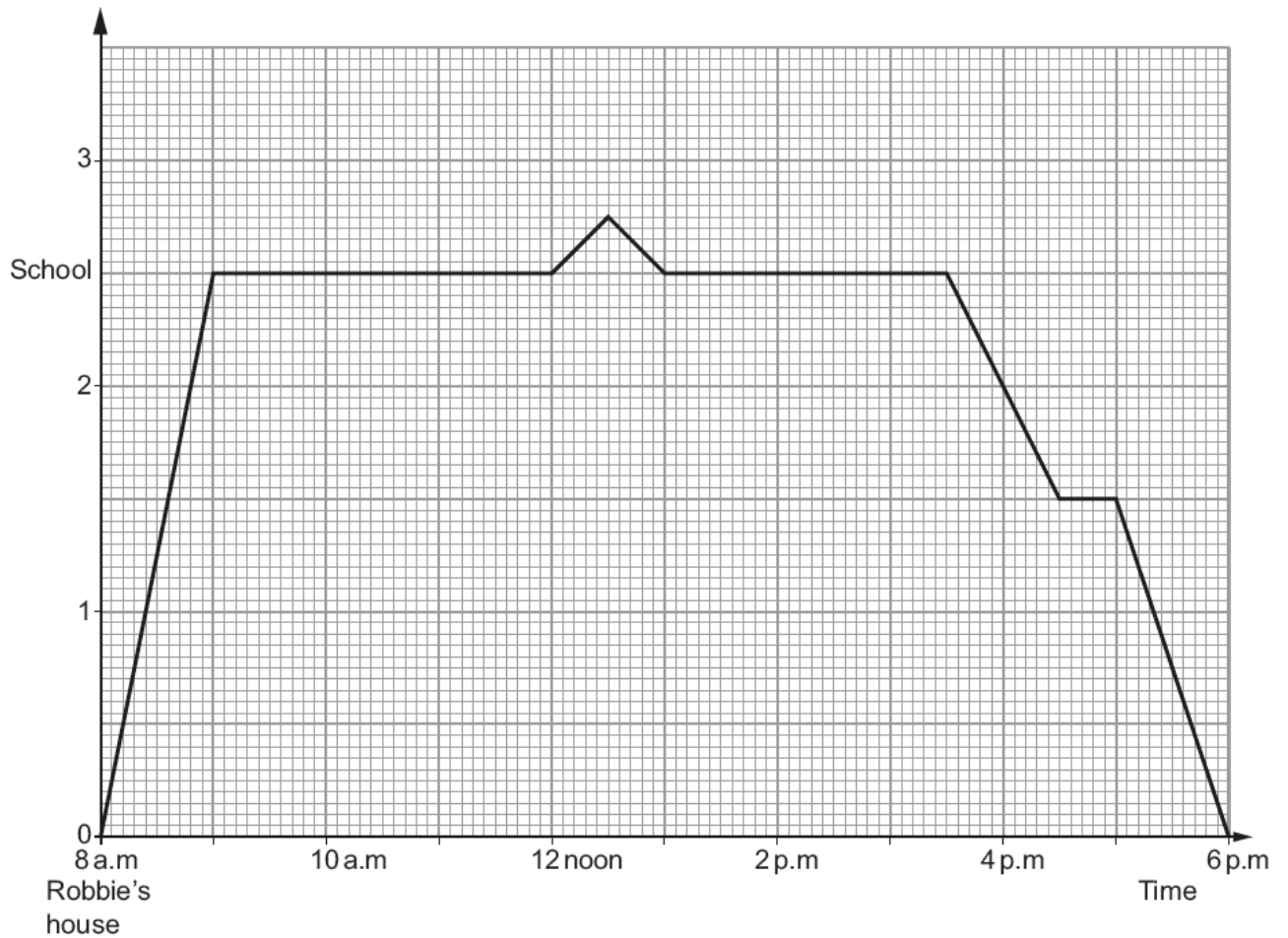
[4]



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 | 10p 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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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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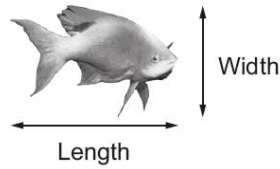
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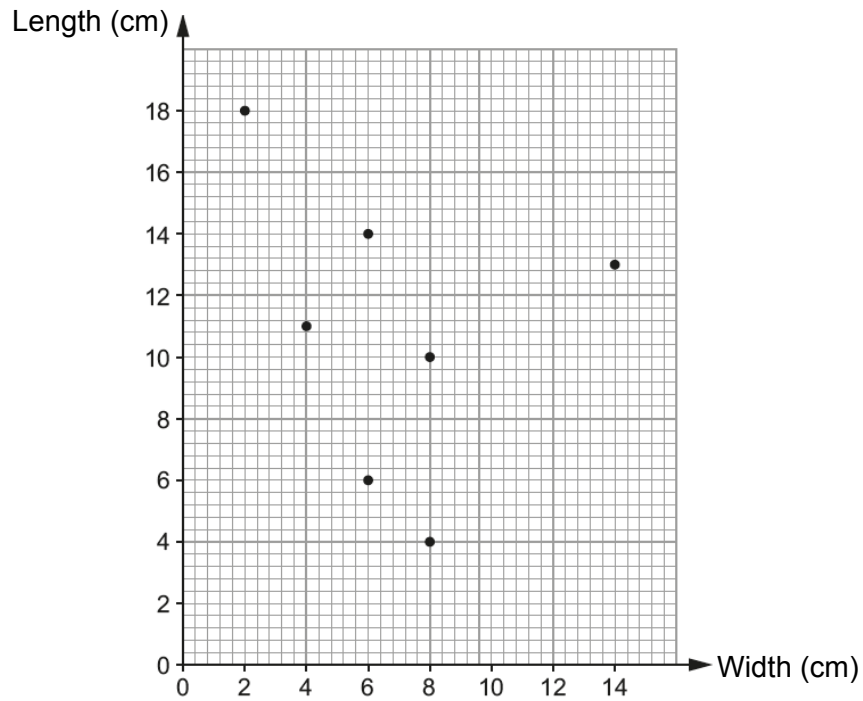
Time taken =

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 \approx 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.

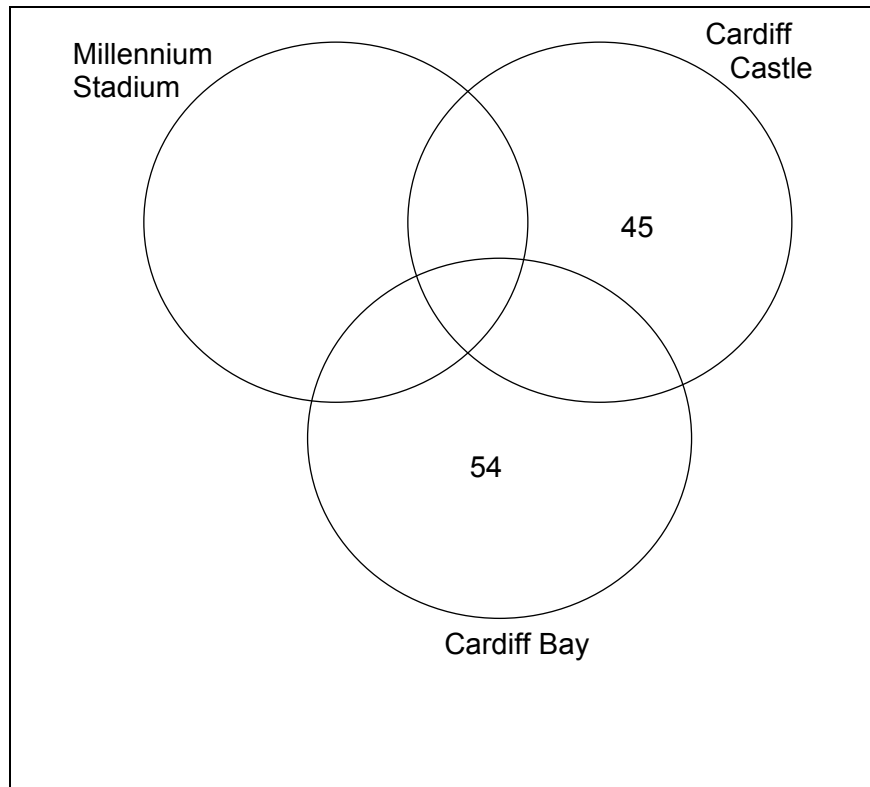
88 had visited Cardiff Castle.

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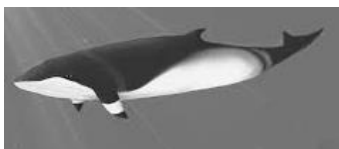
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..... visitors had visited the Millennium Stadium but not Cardiff Castle or Cardiff Bay.

8. A magazine article states:

Each year one third of the world's whale population migrates around the North West coast of Scotland.



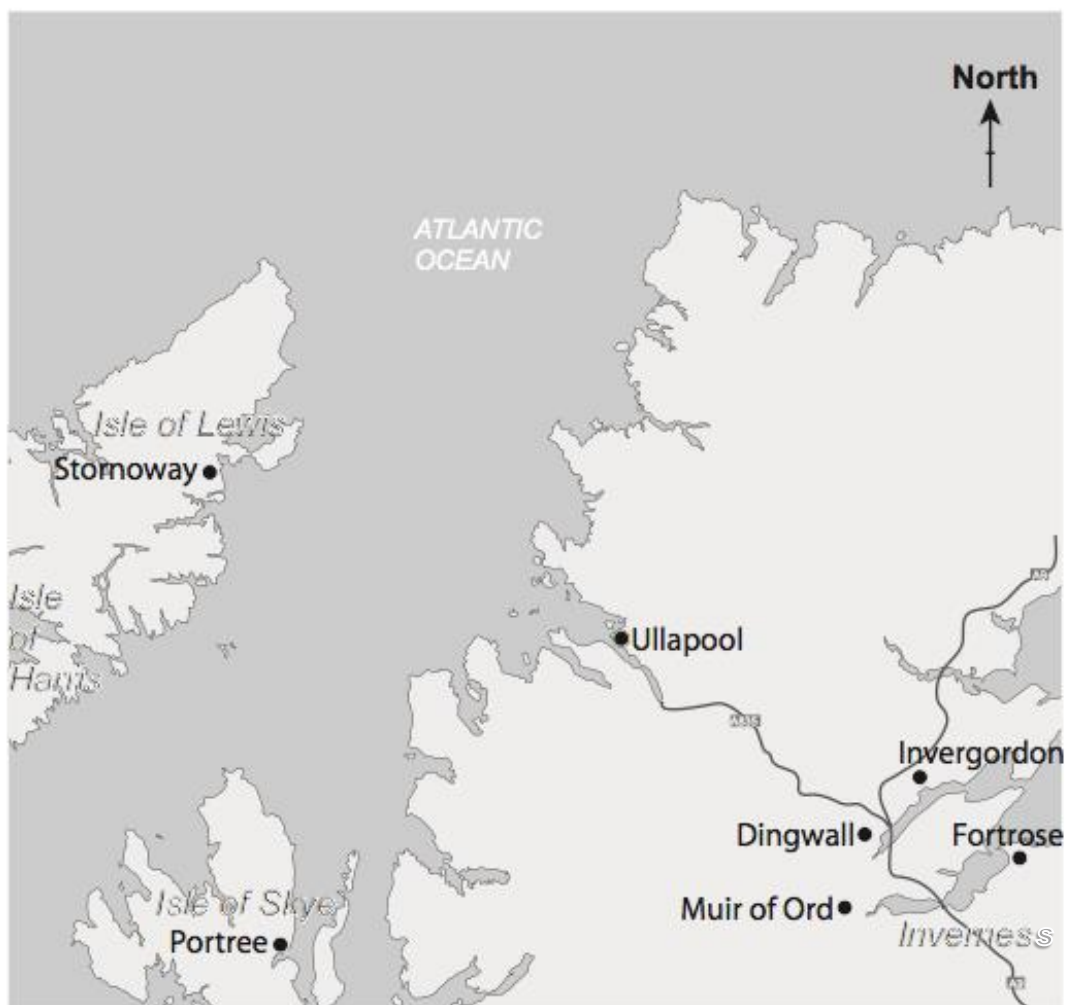
A Minke whale is sighted by a number of people in a sea area near North Minch

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 Stornoway is between

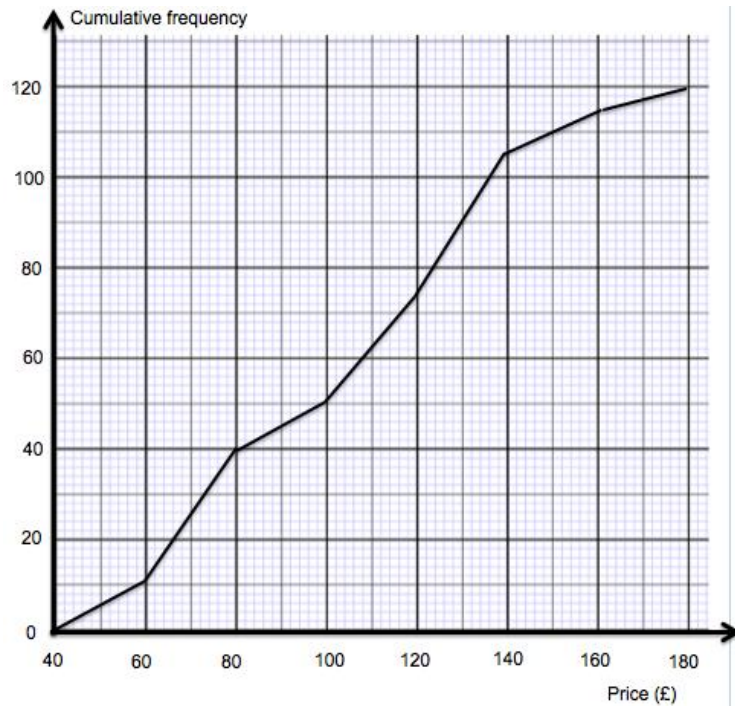
..... ° and °.



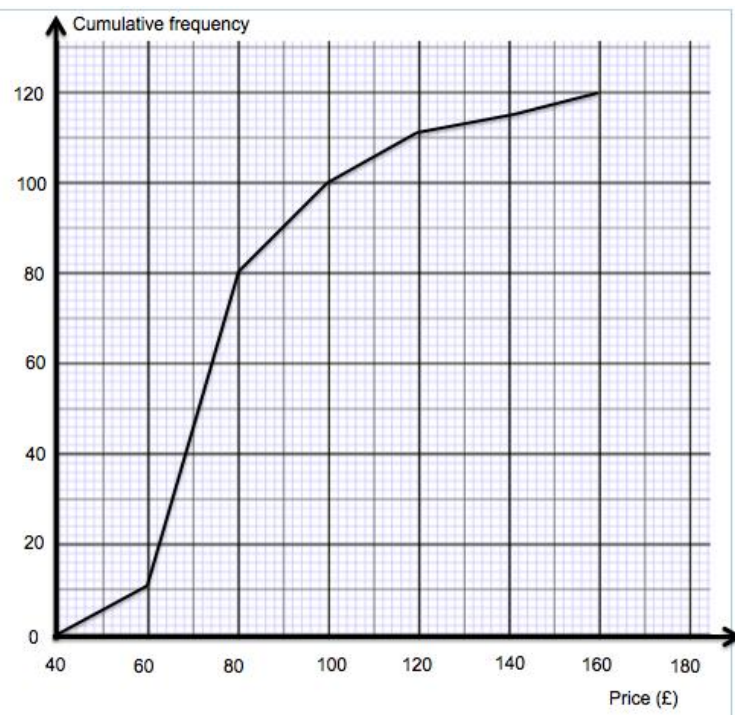
- (b) Before agreeing to improve the hotel's swimming pool, the manager of the *Hafod Hotel* decides to check the price of a double room for a night, in hotels with and without swimming pools.

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

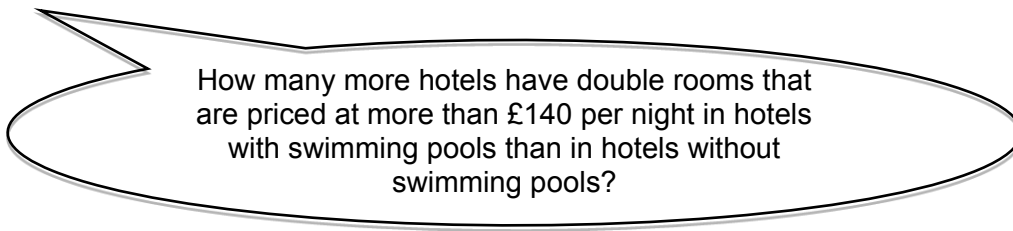
Prices for double rooms at hotels with a swimming pool



Prices for double rooms at hotels without a swimming pool



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



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]

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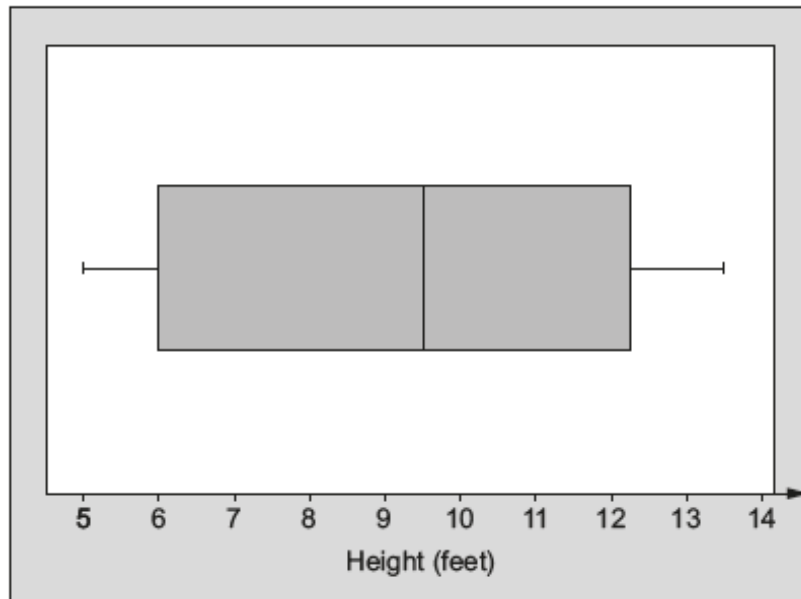
307

310

308

3075

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]

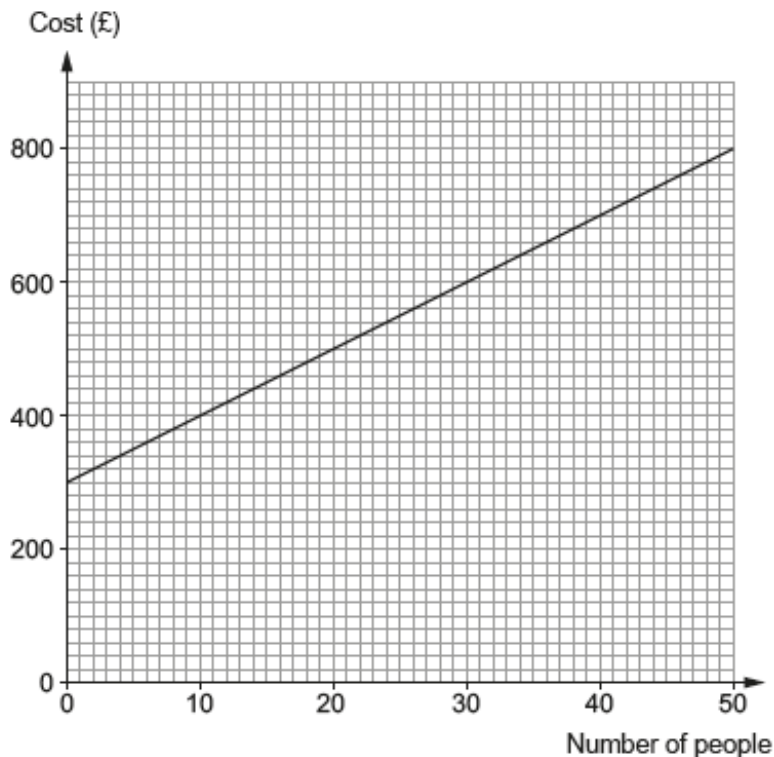
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- (b) Circle either TRUE or FALSE for each of the following statements. [2]

| | | |
|---|------|-------|
| 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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