Surname	Centre Number	Candidate Number
Other Names		0

GCSE

3310U40-1

S19-3310U40-1

MATHEMATICS – NUMERACY
UNIT 2: CALCULATOR-ALLOWED
INTERMEDIATE TIER

THURSDAY, 9 MAY 2019 – MORNING

1 hour 45 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

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 the work written on the continuation page.

Take π as 3·14 or use the π button on your calculator.

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 **2***(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.	**11**	
2.	**8**	
3.	**4**	
4.	**5**	
5.	**6**	
6.	**10**	
7.	**8**	
8.	**11**	
9.	**9**	
10.	**8**	
Total	**80**	

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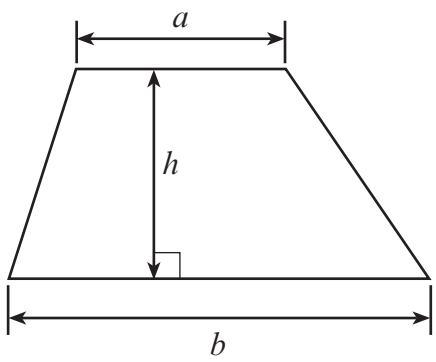
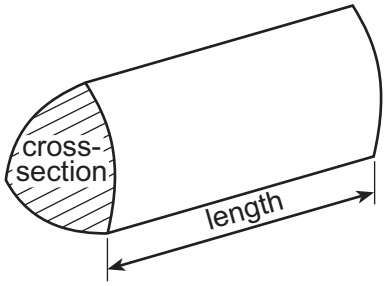
Formula List – Intermediate Tier

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



Volume of prism = area of cross-section × length



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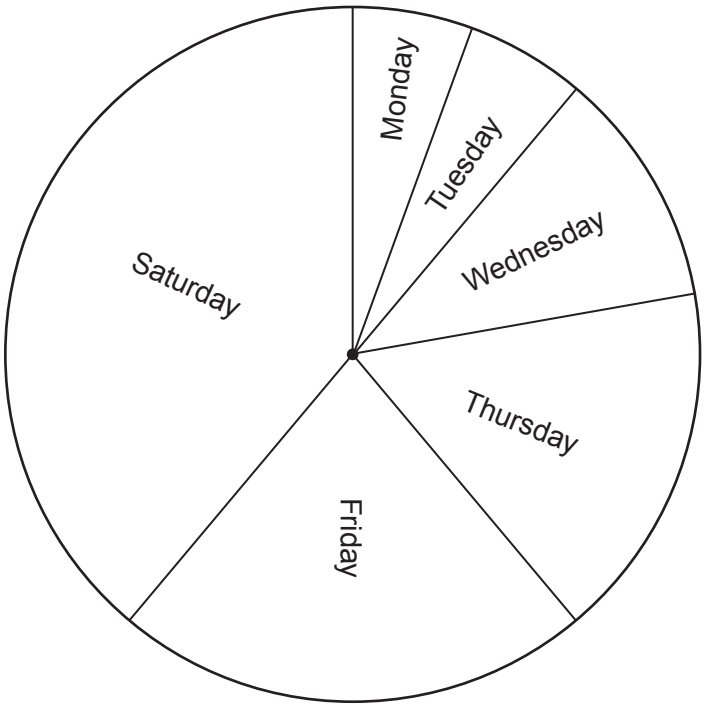
1. Ian owns two shops. One is in Ffordd Owain and the other is in Arthur Avenue.
For each shop, Ian has been presented with the sunglasses sales for last week.

Ffordd Owain daily sunglasses sales for last week

In total, 90 pairs of sunglasses were sold.



Arthur Avenue daily sunglasses sales for last week

Key: represents 4 pairs of sunglasses

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(a) For each shop, what fraction of the sunglasses sold last week was sold on Friday? Express your answers as fractions in their simplest terms.

(i) Ffordd Owain: [2]

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Fraction, in its simplest terms .....

(ii) Arthur Avenue: [2]

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Fraction, in its simplest terms .....

(b) At the Arthur Avenue shop, what percentage of the sunglasses sold last week was sold on Tuesday? [2]

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(c) On Saturday, how many more sunglasses were sold in the Ffordd Owain shop than in the Arthur Avenue shop? [5]

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

Edmund needs carrots to make soup.
His two local supermarkets are *SuperM* and *FairMart*.

450 g of carrots cost 27p in *SuperM*.
The same variety of carrots cost 57p per kg in *FairMart*.

Edmund wants to buy carrots that are the best value for money.
Should he buy carrots from *SuperM* or from *FairMart*?
Give a reason for your answer.
You must show all your working. [3 + 2 OCW]

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(b) Edmund plans to use the recipe shown to make soup.

Carrot soup, serves 4 people

450 g carrots
0·8 litres stock
4 tablespoons of cream
2 onions

He starts to write the recipe for serving 25 people.

Carrot soup to serve 25 people

..... g carrots
..... litres stock
..... tablespoons of cream
..... **whole** onions

Edmund does not want part of an onion left over.
Complete the recipe for Edmund. [3]

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3. Rhys lives in St Asaph.
He wants to video call friends in Montreal, New Delhi and Sydney.

(a) The table below shows times around the world when it is 12:30 in St Asaph.

City	Time	Day
St Asaph	12:30	Saturday
Montreal	07:30	Saturday
New Delhi	17:00	Saturday
Sydney	21:30	Saturday

(i) When it is 23:30 on Saturday in St Asaph, what time and day is it in Montreal?
Circle your answer. [1]

04:30, Sunday 07:30, Saturday 18:30, Saturday

02:30, Saturday 12:30, Saturday

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(ii) When it is 01:00 on Sunday in Sydney, what time and day is it in St Asaph?
Circle your answer. [1]

16:00, Sunday 16:00, Saturday 10:00, Sunday

10:00, Saturday 06:00, Monday

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(b) 1 Australian dollar (AUD) is worth £0.61.

How much is £320 worth in Australian dollars?
Give your answer to the nearest Australian dollar. [2]

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£320 = ... AUD

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4.

Ice skate hire charges

Hire any pair of ice skates for £3.25
PLUS
£2.40 for every hour or part of an hour hired*

*any minute or more into the next hour is charged as 1 hour

(a) Bryn returns his hired ice skates after 3 hours 38 minutes.
How much will the total charge be for hiring these ice skates? [2]

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(b) Beth pays £8.05 to hire ice skates.
What is the minimum whole number of minutes that she could have hired the ice skates for before returning them? [3]

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5. *(a)* A survey was carried out to find out how often people used the swimming pool in a sports centre.
The following two questions were asked in a questionnaire.

> Q1. How far away from the sports centre do you live?
>
> Q2. How often do you go swimming?

(i) Give **one** reason why question 1 is a useful question to ask. [1]

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(ii) Explain why the answers to question 2 might be difficult to analyse. [1]

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(iii) A person answers that they go swimming.
Write a question that could be used to find out how long this person spends in the pool, on average, each time they go swimming.
You must give groups for collecting the data. [2]

Question:

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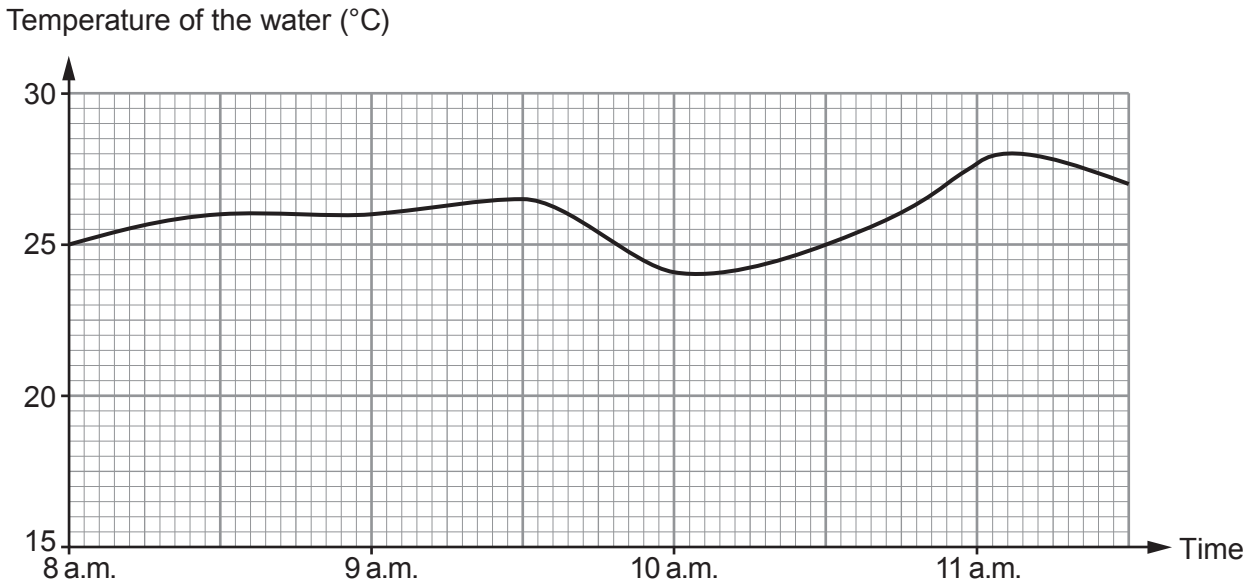
(b) Jamil works at the *Hafan Parc* swimming pool.
He records the temperature of the water in the pool from 8 a.m. to 11:30 a.m.
Jamil draws the following graph.



Use the graph to answer the following questions about the temperature of the water between 8 a.m. and 11:30 a.m.

(i) What is the range of the temperature of the water? [1]

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(ii) For swimming, the most suitable temperature of the water in the pool is between 27°C and 28°C inclusive.
Find the length of time that the water in the pool was most suitable for swimming.
Give your answer in minutes. [1]

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The water was most suitable for ..... minutes

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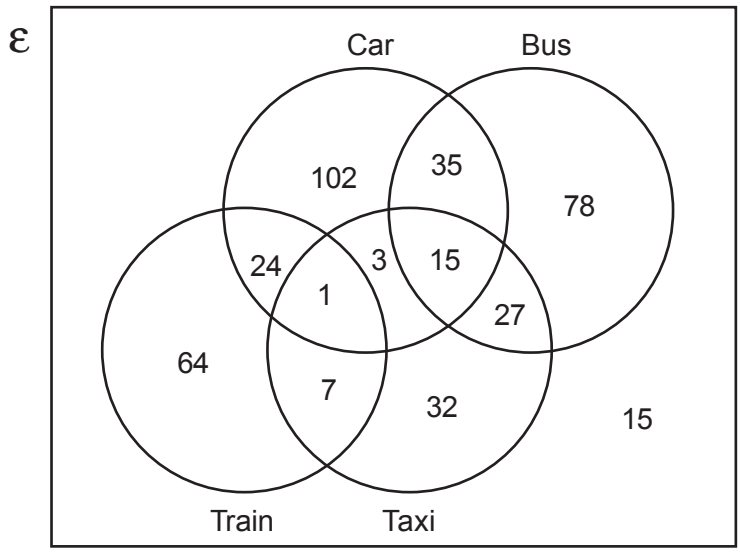
6.

(a) Rhian carried out a survey before an international rugby match.
She asked a number of Wales supporters how they travelled to the match.

Rhian displayed her results in a Venn diagram, as shown below.



(i) How many of these supporters' journeys included travel by both train and taxi?
Circle your answer. [1]

1 3 7 8 10

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(ii) How many of these supporters' journeys included travel by car?
Circle your answer. [1]

19 78 102 180 195

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(iii) Calculate the percentage of the number of supporters in the survey whose journeys did **not** include any travel by car, bus, train, or taxi.
Give your answer correct to 1 decimal place. [4]

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(b) There were 71 532 supporters in the stadium watching the match.
A newspaper headline writes this number of supporters correct to 2 significant figures.
Which of the following numbers should appear in this headline?
Circle your answer. [1]

72 71 000 71 400 71 500 72 000

(c) The rugby pitch at the stadium is measured.
On the diagram below, each measurement is given **correct to the nearest 10 centimetres**.

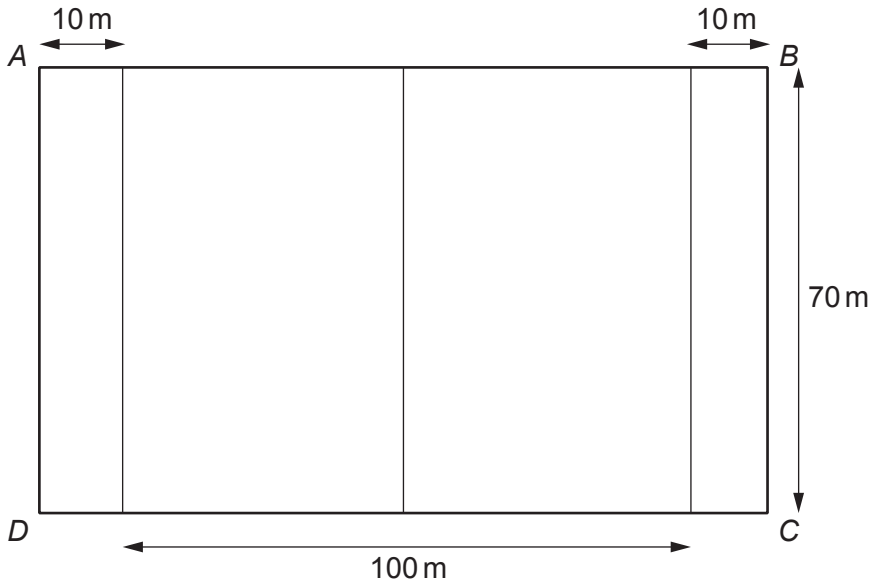

Diagram not drawn to scale

What is the least possible length of *AB*?
Give your answer in metres.
You must show all your working. [3]

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7. *(a)* (i) The internal measurements of a tin of baked beans are:

- radius 3·6 cm,
- height 9·3 cm.

Calculate the internal volume of the tin. [2]

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(ii) Every 1 cm^3 of baked beans in a tin has a mass of 1 g.
A portion of baked beans is $\frac{1}{2}$ a tin.
What is the mass of a portion of baked beans? [1]

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A portion of baked beans has a mass of ..... g

(b) A mathematically similar tin of baked beans has a radius of 4·2 cm.

Diagram not drawn to scale

Calculate the height of the larger tin of beans. [2]

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(c) In a portion of baked beans there is:
- 1·85 g of salt,
- 11·7 g of sugar.

For women, the recommended daily allowance of:
- salt is 6 g,
- sugar is 90 g.

Consider a portion of baked beans.
Is it salt or sugar that provides the greater proportion of the recommended daily allowance for women?
You must show all your working. [3]

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8. *(a)* On 1st June, Delyth budgets for her next electricity bill.
This bill will be for the months of June, July and August.
Her bill will have to be paid at the beginning of September.

She knows:

- the standing charge is £8 **per month**,
- her meter reading on 1st June is 20 150 kWh,
- her estimate for her meter reading on 31st August is 20 950 kWh,
- her agreement states that electricity costs 23p per kWh,
- VAT at 5% is payable on the total of the standing charge and the cost of the electricity used.

Calculate how much she should budget each month so that she is able to pay her next electricity bill. [7]

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(b) Delyth invested £500 in a saver bank account 20 years ago.
She did not withdraw money or make any other payments into this account.
The bank paid 2·2% compound interest per annum during the first 5 years.
Compound interest at 1·6% per annum was paid for the remaining 15 years.

Delyth closes the account after 20 years.
How much money should she receive? [4]

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9. Mr Jakob notices a crack in a vertical wall which stands on horizontal ground.

(a) Mr Jakob fixes two temporary supports against the wall, as shown in the diagram below.

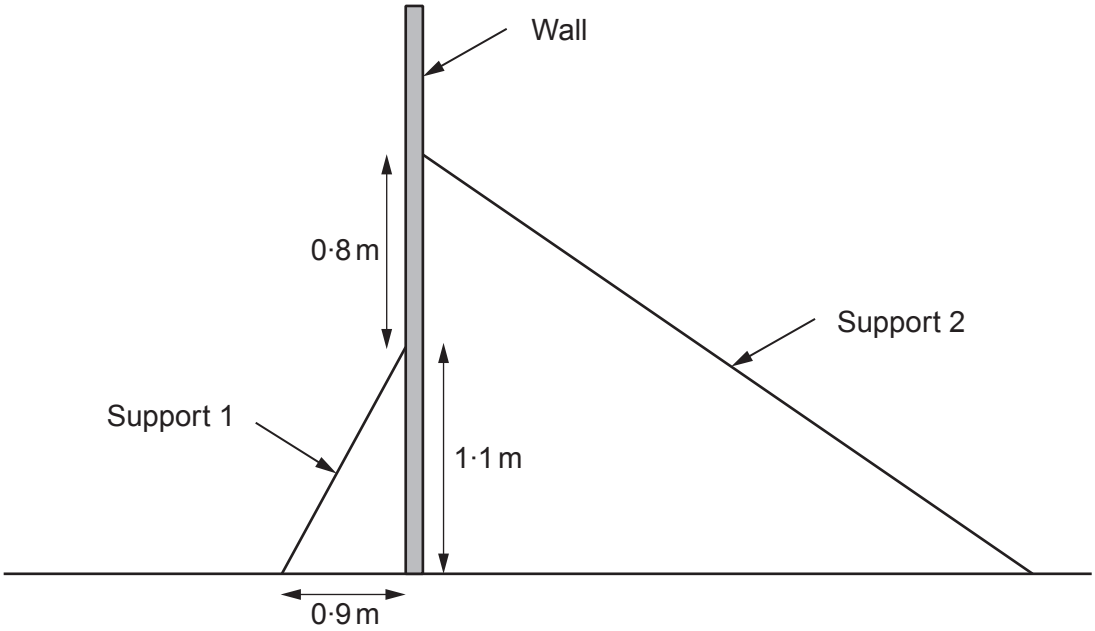

Diagram not drawn to scale

(i) Calculate the length of Support 1. [3]

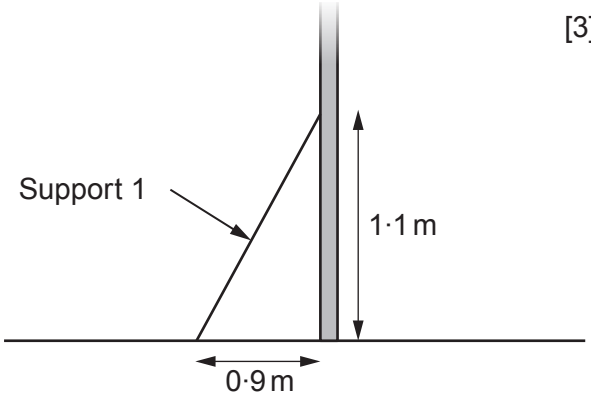

Diagram not drawn to scale

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(ii) The length of Support 2 is 2·6 m.
Calculate the angle between the horizontal ground and Support 2. [3]

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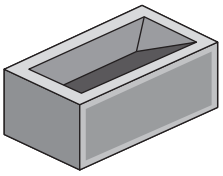
(b) Mr Jakob gets a quote of £516 for rebuilding his wall.



The quote includes:
- 8 hours' labour costs at £22.50 per hour,
- a 20% discount off the cost of the bricks.

Calculate the cost of the bricks before the discount. [3]

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10. *(a)* *Kenworth Electrical* specialises in wiring new houses.
The monthly wages of all *Kenworth Electrical* employees are summarised in the frequency table below.

Monthly wage, £x	Frequency
$1800 \leqslant x < 2000$	64
$2000 \leqslant x < 2100$	50
$2100 \leqslant x < 2400$	2
$2400 \leqslant x < 5800$	0
$5800 \leqslant x < 7800$	4

(i) How many people does *Kenworth Electrical* employ? [1]
Circle your answer.

5 6 50 100 120

.....

(ii) In which group does the median monthly wage lie?
Circle your answer. [1]

$1800 \leqslant x < 2000$ $2000 \leqslant x < 2100$ $2100 \leqslant x < 2400$

$2400 \leqslant x < 5800$ $5800 \leqslant x < 7800$

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(iii) Alysia is an accountant working for *Kenworth Electrical*.
She knows the exact wage of each employee.

Alysia says,

It would be misleading to use the mean monthly wage as an average.

Explain why Alysia has reached this conclusion. [1]

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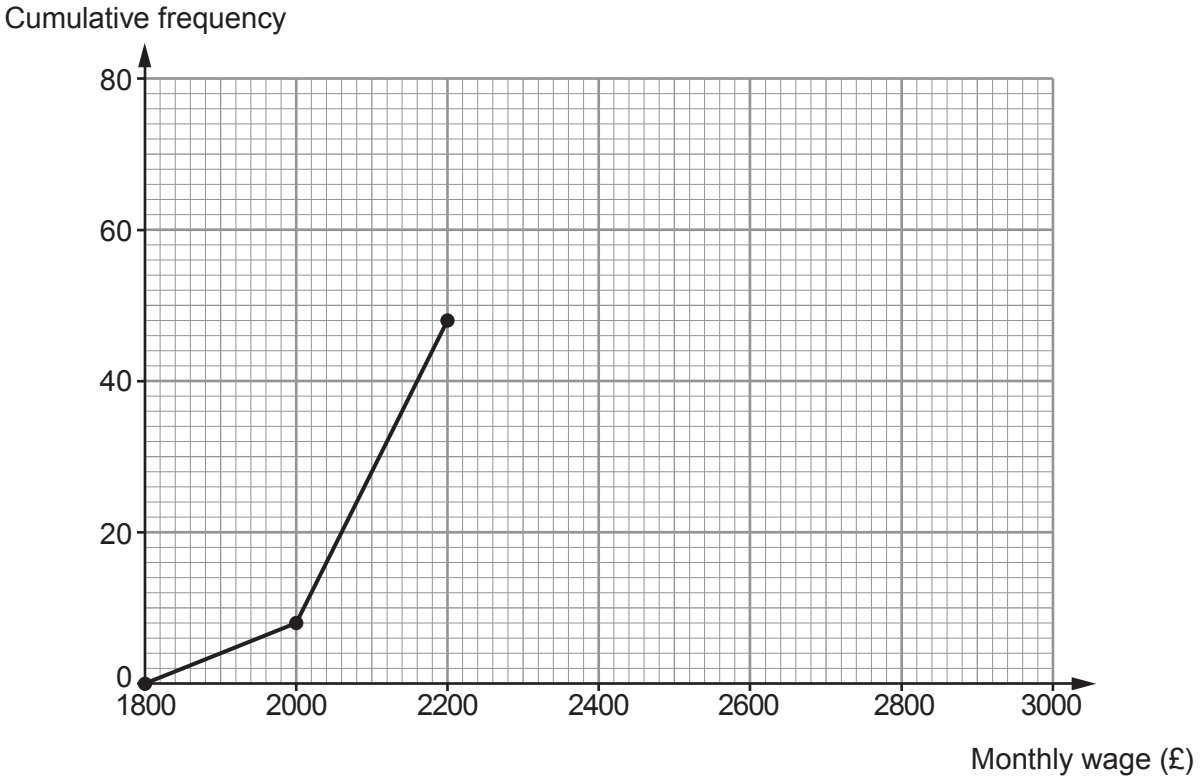
(b) *Maesteg Electrical* also specialises in wiring new houses.
The monthly wages of all *Maesteg Electrical* employees are summarised in the frequency table below.

Monthly wage, £x	Frequency
$1800 \leqslant x < 2000$	8
$2000 \leqslant x < 2200$	40
$2200 \leqslant x < 2400$	24
$2400 \leqslant x < 3000$	8

(i) Use the frequency table to complete the following cumulative frequency diagram to display the monthly wages of all *Maesteg Electrical* employees. [2]



Use the cumulative frequency diagram to answer each of the following questions.

(ii) Which of the following is the best estimate for the median monthly wage of *Maesteg Electrical* employees?
Circle your answer. [1]

£2100 £2160 £2200 £2360 £3000

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(iii) Calculate an estimate of the percentage of *Maesteg Electrical* employees who have a monthly wage of less than £2050.
You must show all your working. [2]

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END OF PAPER

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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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