Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3310U30-1

A19-3310U30-1

TUESDAY, 5 NOVEMBER 2019 – MORNING

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER

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 additional page at the back of the booklet. Question numbers must be given for all work written on the additional 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 **6**, 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.	**7**	
2.	**8**	
3.	**5**	
4.	**3**	
5.	**4**	
6.	**8**	
7.	**2**	
8.	**8**	
9.	**11**	
10.	**6**	
11.	**6**	
12.	**7**	
13.	**5**	
Total	**80**	

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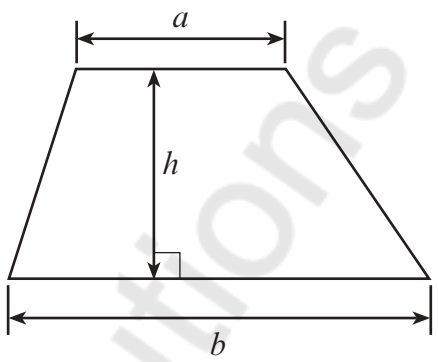
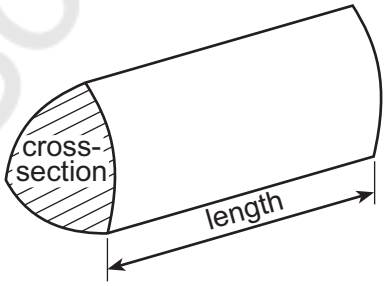
Formula List – Intermediate Tier

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



Volume of prism = area of cross-section × length



Examiner only

1. Every year, *Aber Young Farmers* club organises a sponsored walk.

(a) This year, the length of the walk is 20 miles.
Calculate the length of the walk in km. [2]

20×1.6
$= 32 \text{ km}$

(b) Last year, the walk raised a total of £3600.
It cost £180 to organise the walk last year.
Give the cost of organising the walk as a percentage of the total raised. [2]

$\frac{180}{3600} \times 100$
$= 5\%$

(c) This year, walkers will be charged to take part.
Aber Young Farmers decided that:

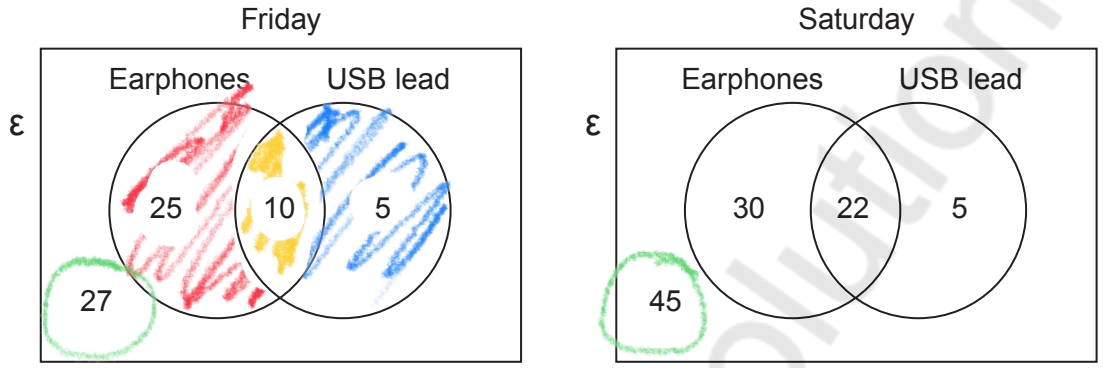
charge in pence = 3 × height of the walker in cm

What is the height of the shortest walker who will need to pay a charge of more than £5?
Give your answer correct to the nearest cm.
You must show all your working. [3]

$5 = 3 \times h$
$h = \frac{5}{3}$
$= 1.667$
$= 166.7 \text{ cm}$
$\approx 167 \text{ cm}$

Examiner only

2. *Sound5* sells pairs of earphones and USB leads.
The Venn diagrams show the number of customers who visited the shop last Friday and last Saturday.
No customers visited the shop on both days.
No customers bought more than 1 pair of earphones and 1 USB lead.



Earphones sell for £15 and USB leads sell for £3.

(a) How much did *Sound5* customers spend buying USB leads on **Friday**? [2]

10 + 5 = 15
3 × 15
= £45

(b) Over the two days, how many customers did **not** buy either earphones or a USB lead? Circle your answer. [1]

27 45 40 57 72

45 + 27
72

Examiner only

(c) What fraction of **Friday**'s customers bought both earphones and a USB lead? Circle your answer. [1]

$\frac{1}{10}$ $\frac{1}{4}$ $\frac{10}{40}$ $\frac{10}{67}$ $\frac{40}{67}$

$5 + 10 + 27 + 25 = 67$ $\frac{10}{67}$

(d) How much money in total did *Sound5* customers spend on buying earphones, USB leads or both on **Saturday**? You must show all your working. [4]

$(30 + 22)\,15 = 780$

$(22 + 5)\,3 = 81$

861

£861

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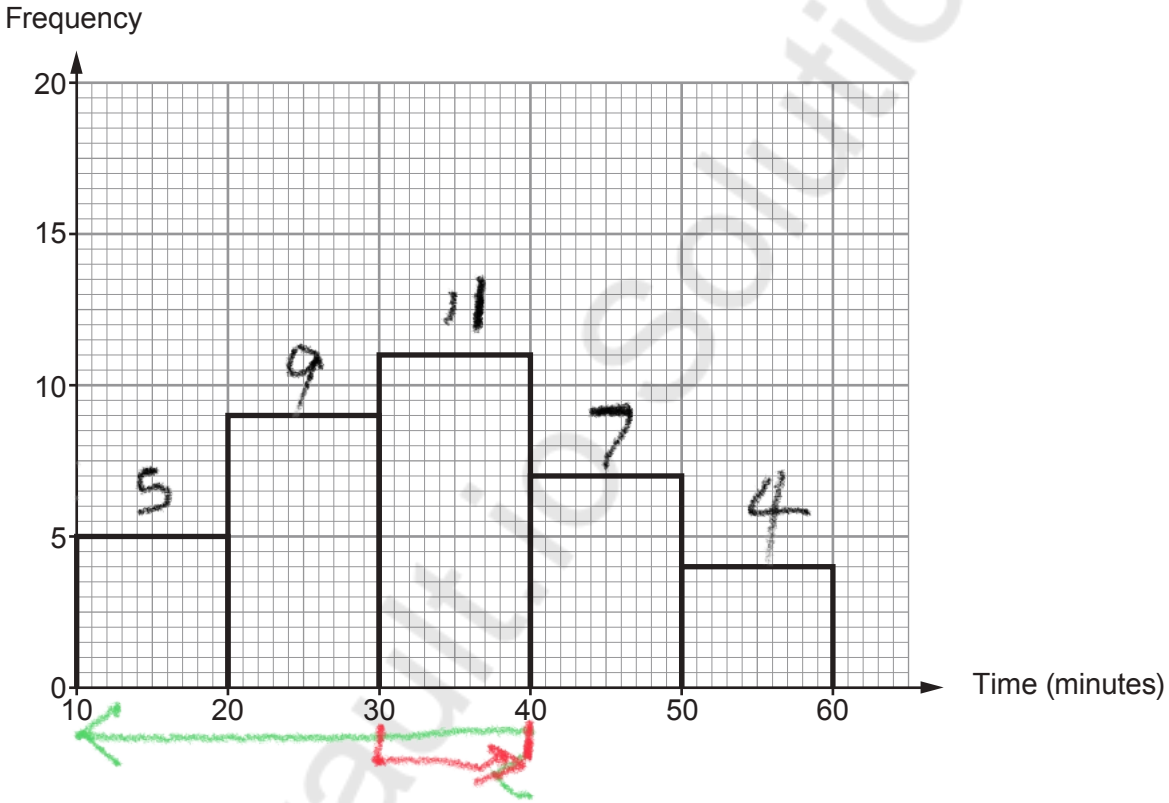
3. The students in Mr Griffin's mathematics class all recorded how long they spent on their last mathematics homework.
None of his students spent less than 10 minutes on this homework.
All of his students attempted the homework.

Mr Griffin has drawn a frequency diagram to display the times recorded by his students.
He used groups of width 10 minutes:

$10 \leqslant \text{time} < 20, \quad 20 \leqslant \text{time} < 30, \quad$ and so on.



(a) Did any student get all their mathematics homework correct?

Yes ☐ No ☐ Can't tell ☑

You must give a reason for your answer. [1]

doesn't show the accuracy of the homework

Examiner only

(b) How many students are there in Mr Griffin's mathematics class? [2]

$5+9+11+7+4=36$

(c) Consider the students who spent less than 40 minutes on their homework. What fraction of these students spent 30 minutes or more on their homework? [2]

$5+9+11=25$

$=\frac{11}{25}$

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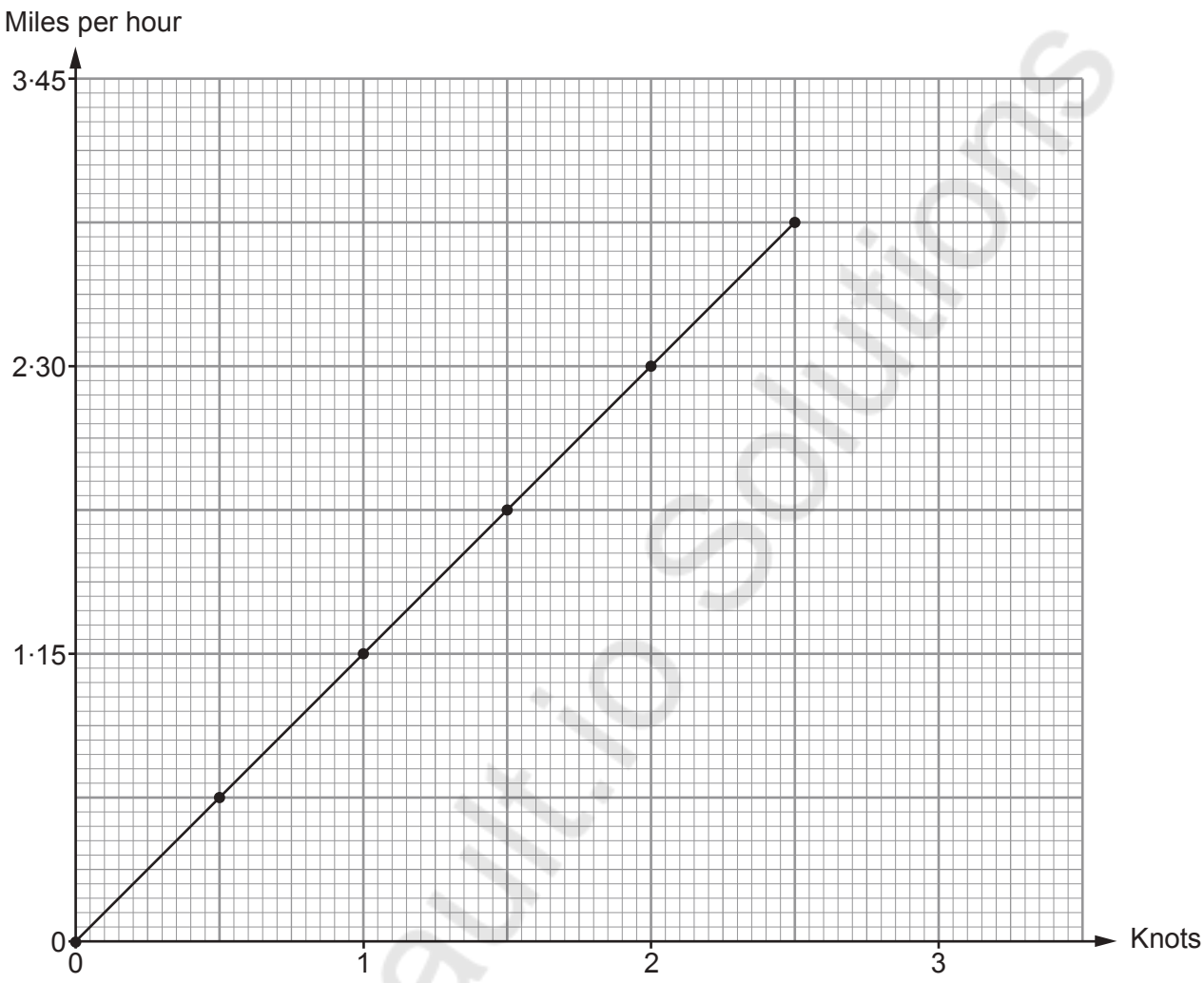
4. Emily has drawn a conversion graph, as shown below.
She uses it to help her brother understand how to convert knots to miles per hour.



Complete each of the following statements.

(a) 23 miles per hour is equal to ..... 20 ..... knots. [1]

2·3 = 2
23 = 20

(b) 5 knots is equal to ..... 5 75 ..... miles per hour. [2]

23 + 23 + 15
(2) (2) (1)
= 5·75

Examiner only

5. Ms Logan is calculating her next water bill.
She knows that her fresh water usage is 20 m^3.

On the water company's website she finds the following:

Water charges

- The waste water output is calculated as 80% of the fresh water usage.
- Fresh water usage costs £1.10 per m^3.
- Waste water output costs £1.50 per m^3.

Calculate Ms Logan's water bill. [4]

$FW = 20 \times 1.10$
$= £22$
$0.8 \times 20 \times 1.5 = £24$
$22 + 24$
$= £46$

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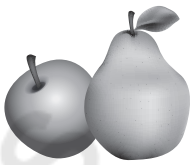
6. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*



Liam buys 3 kg of apples and 2·5 kg of pears.
Pears cost £3.40 per kilogram.
Liam pays a total of £12.40 for the apples and pears.

Calculate the cost of one kilogram of apples. [6 + 2 OCW]

A = 3kg , P = 2.5kg
£3.4/kg

2.5 × 3.4 = £8.75

12.4 − 8.75

A = 3.9
3

= £1.3

Cost of one apple = £1.3
kg

Examiner only

7. Catrin considers the data she needs to collect to find out if people are happy with their bank.

Catrin includes the following questions in her questionnaire.

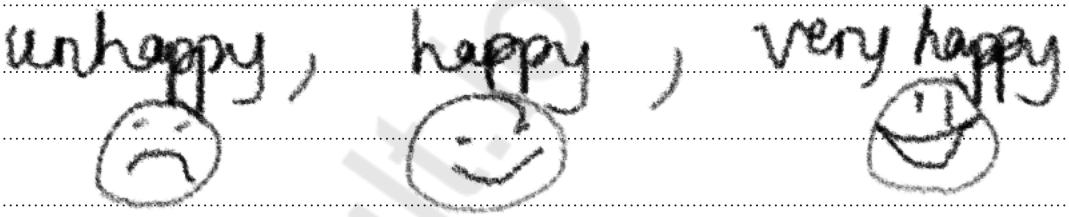
Write down one set of possible groups that could be used as answer options for each of these questions. [2]

Question 1: How old are you?

Groups: 18-25, 26-50, >51

Question 2: If you have a bank account, how happy are you with your bank?

Groups:



Examiner only

8. Sioned and Rhodri are making a kite.

A diagram of the kite they are making is shown below.
AC and *DB* are the diagonals of the kite.
AE = 22 cm, *EC* = 28 cm and *DE* = 20 cm.

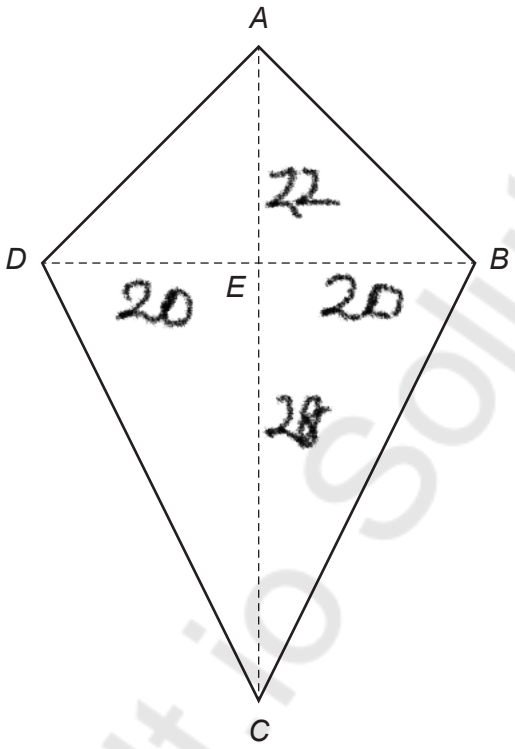


Diagram not drawn to scale

DE = EB
short d = 40 cm
long d = 50 cm

(a) Rhodri makes a statement about their kite being able to fly in strong wind,

"The length of the long diagonal must be at least 120% of the length of the short diagonal."

Assuming Rhodri is correct, should their kite be able to fly in strong wind?
You must show all your working. [4]

$\frac{120}{100} \times 40$ 50 > 48

$= 48\text{cm}$

Yes, it is certain to fly in strong wind

Examiner only

(b) Sioned says,

"The best length for the tail on a kite depends on the area of the kite."

Sioned refers to the table below that she has seen on the internet.

Area of the kite, A	Best length for the tail
$A < 500\,\text{cm}^2$	2 m
$500\,\text{cm}^2 \leqslant A < 900\,\text{cm}^2$	2·4 m
$900\,\text{cm}^2 \leqslant A < 1200\,\text{cm}^2$	3·1 m
$1200\,\text{cm}^2 \leqslant A$	3·5 m

Work out the best length of tail for Sioned and Rhodri's kite.
You must show all your working. [4]

Area of a kite $= \frac{D_1 \times D_2}{2}$

$= \frac{40 \times 50}{2}$

$= 1000\,\text{cm}^2$

$900 \leqslant A < 1200$

Best length for tail $= 3{\cdot}1\,\text{m}$

Examiner only

9. *(a)* Waldo doesn't mind which type of pasta he buys.

In the supermarket, Waldo sees the three packets of pasta shown below.

Strozzapreti pasta	Fusilli pasta	Rigatoni pasta
		
500g for £1.25 S	400g for 96p F	250g for 65p R

Which pasta offers Waldo the best value for money?
You must show all your working. [3]

	50g	100g	1000g
S	12.5p	25p	£2.5
F	12p	24p	£2.4 ✓
R	13	26p	£2.6

500g — £1.25
50g — x
$x = \frac{1.25 \times 50}{500}$
= 12.5p
Fusili is the best value for money

Examiner only

(b) An old recipe is given below.

Arrabiata pasta sauce
Serves 4 people

1 onion
2 × 0·88 lb tins of tomatoes
3 chillies

(i) How many chillies would be needed to make Arrabiata pasta sauce for 48 people? [2]

1 A = 4
48 people = 48 ÷ 4 = 12 Ans
12 × 3 = 36 chillies

(ii) How many **kilograms** of tinned tomatoes are needed to make Arrabiata pasta sauce to serve 20 people? [3]

2 × 0·88 = 1·76 lbs ToT
20 ÷ 4 = 5 As
1·76 × 5 = 8 8lbs ToT
8·8 / 2·2 = 4
4 kg Tins of tomatoes

(c) A pasta factory in Italy produces 5 km of spaghetti per day.
How many centimetres of spaghetti will this factory produce in 7 days?
Give your answer in standard form. [3]

1000 m = 1 km
100 cm = 1 m
1000 × 100 cm = 1 km
500,000 = 5 km
500,000 × 7
3,500,000 = $3 \cdot 5 \times 10^{6}$ cm

Examiner only

10. Agata is paid in pesos.

The tax rates are as follows:

Band	Taxable income	Tax rate
Personal allowance	Up to 200 000 pesos	0%
Standard rate	200 000 pesos to 500 000 pesos	10%
Further rate	over 500 000 pesos	35%

Agata's total earnings before tax are 600 000 pesos.

Calculate how much tax Agata is due to pay.
You must show all your working. [6]

600 K
0 - 200 K — 0%
200 K — 500 K — 10%
500 K - 200 K = 30,000 pesos
300,000 x 10% +
600 K - 500 K
100,000 x 35/100 = 35,000 pesos

30,00 + 35,000
65,000 pesos

Agata's total tax bill 65,000 pesos

Examiner only

11. *(a)* Gwilym is stacking 6 boxes in his garage.

The height of his garage is 2·5 m, correct to the nearest 10 cm.
5 of Gwilym's boxes each have a height of 40 cm, correct to the nearest 10 cm.
The other box has a height of 55 cm, correct to the nearest 5 cm.

Calculate the maximum possible gap between the stack of 6 boxes and the garage ceiling. [4]

h – 2·5m – 250 + 5 – 255

5 of boxes – 40cm – 35 × 5

other box – 55cm – 52·5cm

255 – (5×35 + 52·5)

255 – 227·5

= 27·5 cm

0·275m

(b) Inside one of the boxes is an old clock.
Gwilym takes the clock to be valued.
It is valued at £56.
The clock has decreased in value by 30% from last year.

Calculate how much the clock was worth last year. [2]

100 – 30 = 70%

$\frac{70}{100} \times x = 56$

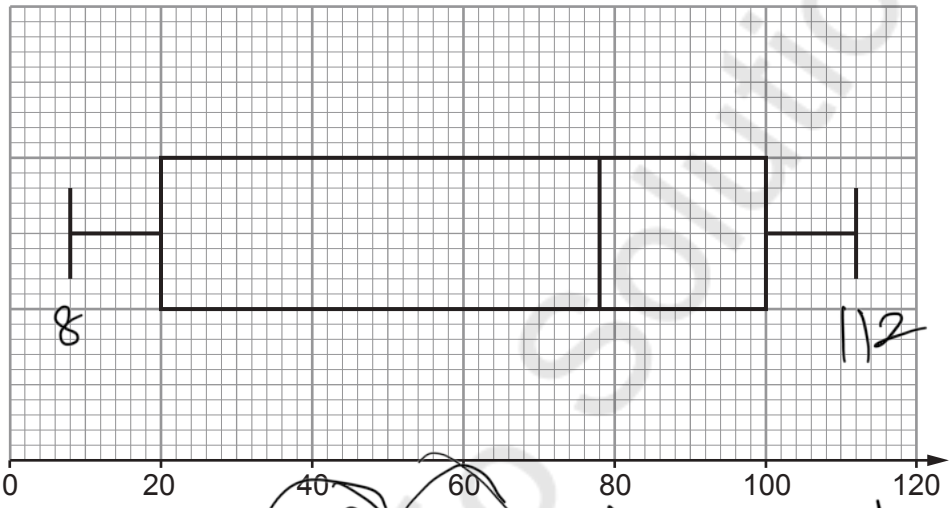
$x = \frac{56 \times 100}{70}$

$x = £80$

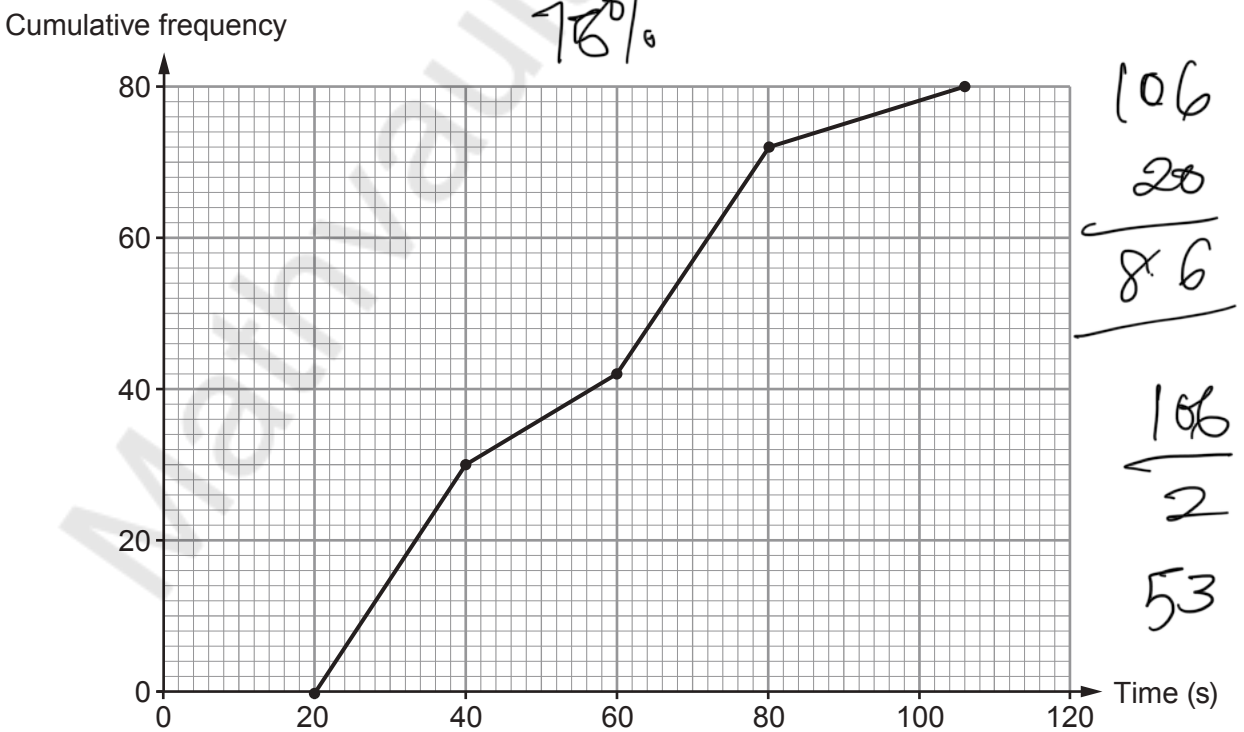
12. On 1st July every year, *Trefor* estate agents record the time from when a phone rings to when it is answered.
The time taken to answer the phone is recorded in seconds.

Trefor displays the data for their agents to see.
The displays for 1st July 2018 and 1st July 2019 are shown below.

1st July 2018
Time taken to answer the phone in seconds



1st July 2019
Time taken to answer the phone in seconds



Examiner only

Use the diagrams on the previous page to answer the following questions.

(a) What is the range of times taken to answer the phone for 1st July 2018?
Circle your answer. [1]

101 seconds 80 seconds 78 seconds 106 seconds 104 seconds

(b) What is the maximum possible range of times taken to answer the phone for 1st July 2019?
Circle your answer. [1]

86 seconds 106 seconds 80 seconds 56 seconds 83 seconds

(c) The manager of *Trefor* estate agents claims that there has been an improvement in the median time taken to answer the phone from 1st July 2018 to 1st July 2019.
Is this true?

Yes ☑ No ☐

You must show all your working. [2]

(d) Complete the following statements.

(i) 'On 1st July 2018, 75% of the phone calls were answered within ..... seconds.' [1]

100 secs

(ii) 'On 1st July 2019, 75% of the phone calls were answered within ..... seconds.' [2]

$\frac{75}{100} \times 80 = 60$

$= 72$ secs

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13. Mr Aston lives at 137 Ffordd Uchel.
He is ordering some new signs for his house and for his gatepost from a website.

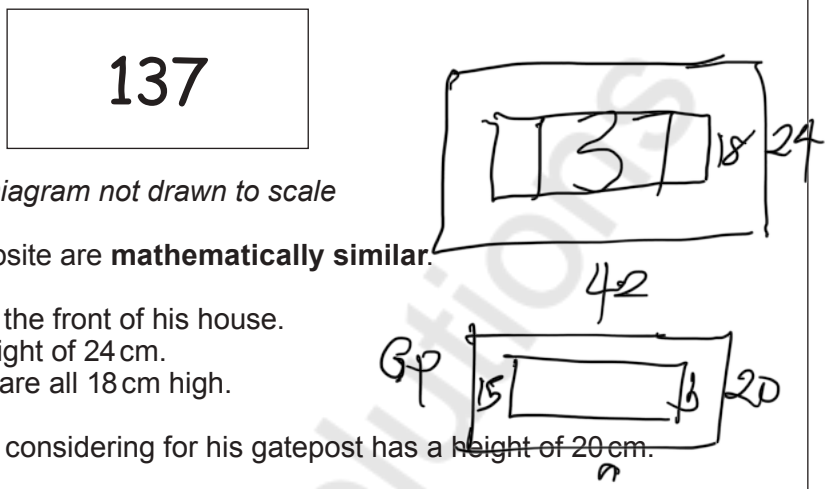

Diagram not drawn to scale

All the signs available on the website are **mathematically similar**.

He selects a rectangular sign for the front of his house.
It has a length of 42 cm and a height of 24 cm.
The digits 1, 3 and 7 on the sign are all 18 cm high.

The rectangular sign Mr Aston is considering for his gatepost has a ~~height of 20 cm.~~

(a) Calculate the height of the digits 1, 3 and 7 on the sign Mr Aston is considering for his gatepost. [2]

$\frac{20}{24} = \frac{5}{6}$ $\quad \frac{5}{8} \times 18 = 3$

5×3

$= 15\text{cm}$

Height of the digits 1, 3 and 7 is 15 cm

Examiner only

(b) Mr Aston's gatepost is 30 cm wide.
Will the sign he is considering fit his gatepost?

Yes ☐ No ☑

You must show all your working and give a reason for your answer. [3]

$\frac{5}{8} \times 42$

5×7

$= 35 \text{ cm}$

$35 > 30$

it will not fit

END OF PAPER

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