Surname	StemUp Model Solution	Centre Number	Candidate Number
First name(s)			0

GCSE

3310U20-1

A22-3310U20-1

THURSDAY, 10 NOVEMBER 2022 – MORNING

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR-ALLOWED FOUNDATION TIER

1 hour 30 minutes

ADDITIONAL MATERIALS

A calculator will be required for 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 the work written on the additional 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.	**16**	
2.	**13**	
3.	**7**	
4.	**5**	
5.	**12**	
6.	**8**	
7.	**4**	
Total	**65**	

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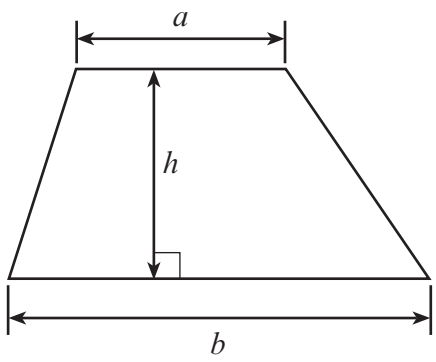
Formula List – Foundation Tier

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



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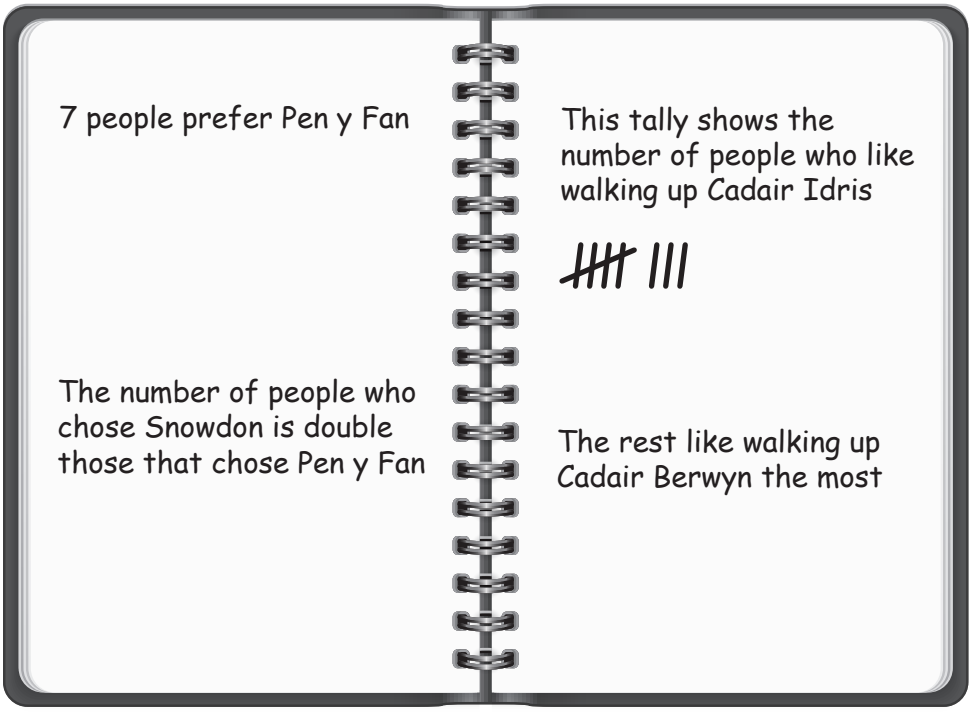
1. Billy belongs to a local walking club.
He asked 35 people in the club which Welsh mountain they liked to walk up the most.
He recorded the information shown below.



(a) Draw a bar chart to show Billy's data.
Use the square grid on the opposite page. [6]

Pen y Fan = 7 people

Snowdon = 2 × 7 = 14 people

Cadair Idris = 8 people (from the tally)

Cadair Berwyn = 35 − 7 − 14 − 8 = 6 people

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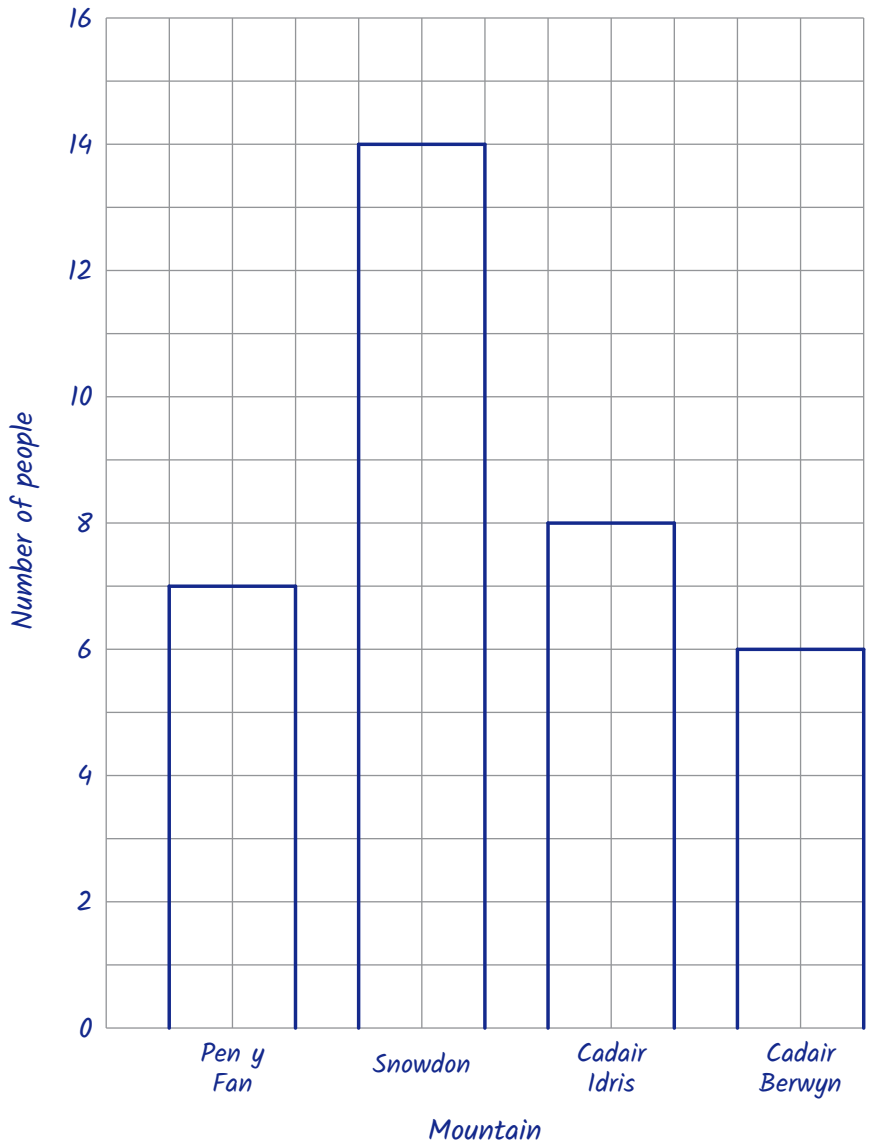

(b) Complete the following sentence. [1]

The difference between the number of people who liked walking up Cadair Idris and the number who liked walking up Pen y Fan is ....1.... .

(c) Billy says,

"The modal choice of mountain is Pen y Fan."

Explain why Billy is **not** correct. [1]

Billy is not correct because Snowdon was chosen by the most people (14 people), so the modal choice is Snowdon, not Pen y Fan (7 people).

3310U201 05

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(d) Billy went for a walk up Pen y Gadair Fawr.

(i) Pen y Gadair Fawr is 800 metres high.
Calculate the height of Pen y Gadair Fawr in feet. [2]

Use: 1 metre is 3·3 feet

Height = 800 × 3.3

= 2640 feet

Pen y Gadair Fawr is 2640 feet high.

(ii) The walk took Billy 3 hours and 45 minutes.
He started his walk at 10:30 a.m.
At what time did he finish his walk?
Give your answer using the 24-hour clock. [2]

10:30 + 3 hours = 13:30

13:30 + 45 minutes = 14:15

He finished his walk at 14:15

(iii) Look at the table below.
It gives the temperature at 6 a.m. each day for a week in March at Pen y Gadair Fawr.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Temperature (°C)	–2	0	1	3	4	3	–1

Use the information in the table above to complete the following statements. [4]

The day with the lowest temperature is Monday

The range of these temperatures is 6 °C

The median of these temperatures is 1 °C

Range = 4 – (–2) = 6 °C

In order: –2, –1, 0, 1, 3, 3, 4 median = 4th value = 1 °C

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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.*

Mrs Smith is planning to hold a tea party in her garden.

The costs for the party are shown in the table below.

Item	Cost
36 scones	52 pence each
4 pots of cream	£1.27 per pot
3 jars of strawberry jam	£2.16 per jar
9 plates of sandwiches	£7.98 per plate
Drinks and decorations	£230

Mrs Smith has already saved £250 towards the cost of the party.

How much more money does Mrs Smith need for the party?
You must show all your working. [6 + 2 OCW]

Cost of scones = 36 × 52p = 1872p = £18.72

Cost of cream = 4 × £1.27 = £5.08

Cost of jam = 3 × £2.16 = £6.48

Cost of sandwiches = 9 × £7.98 = £71.82

Cost of drinks and decorations = £230

Total cost = £18.72 + £5.08 + £6.48 + £71.82 + £230

= £332.10

Extra money needed = £332.10 − £250 = £82.10

Mrs Smith needs £82.10 more for the party.

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(b) Mrs Smith wants to make her own bunting to decorate the garden.

The triangles for the bunting are in the shape of isosceles triangles.

A sketch of the pattern that Mrs Smith is going to use to make her bunting is shown below.

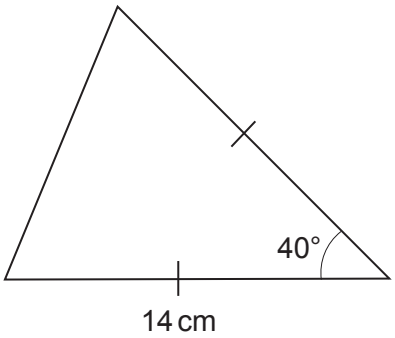
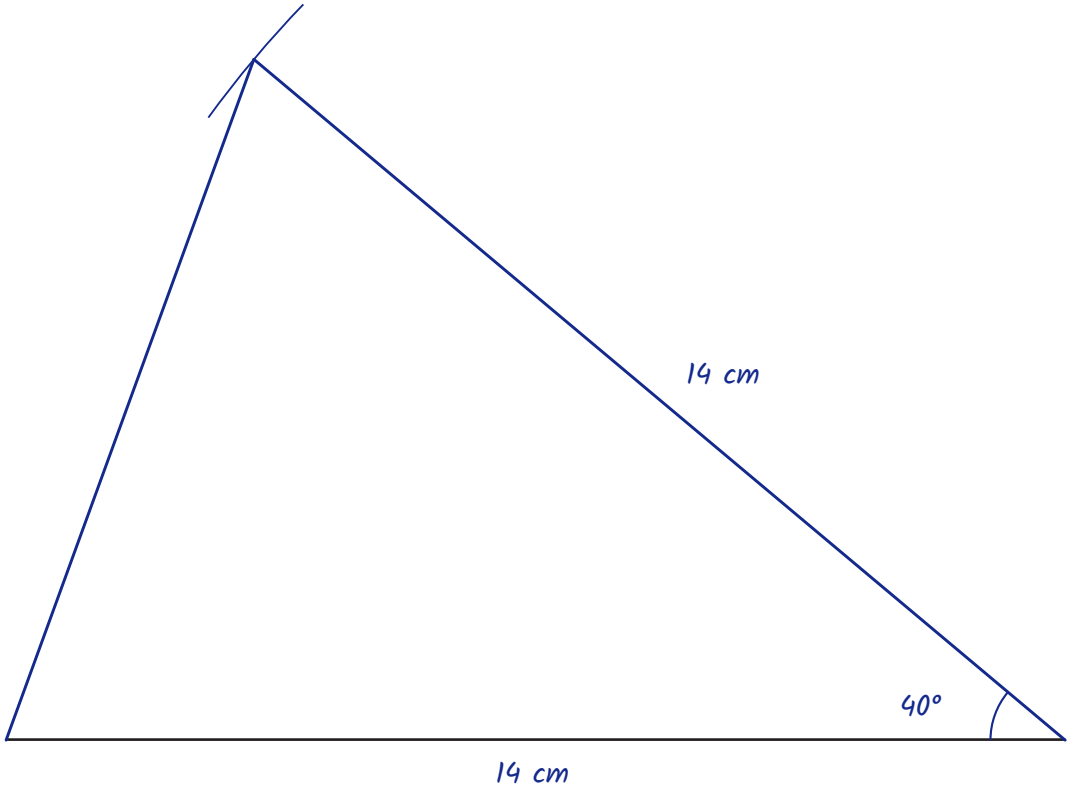


Diagram not drawn to scale

Make an accurate drawing of the pattern for the bunting.
One side has already been drawn for you. [3]



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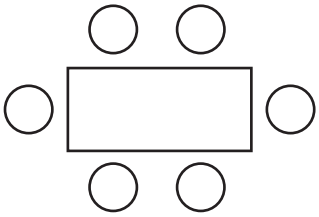
(c) Mrs Smith is planning to use a number of identical rectangular tables for her party. There will be 18 people at the party, including Mrs Smith.

Six chairs fit around one table, as shown in the diagram below.



She would like all the tables to be joined together.

All the tables must be joined together either:

- with their shorter sides touching

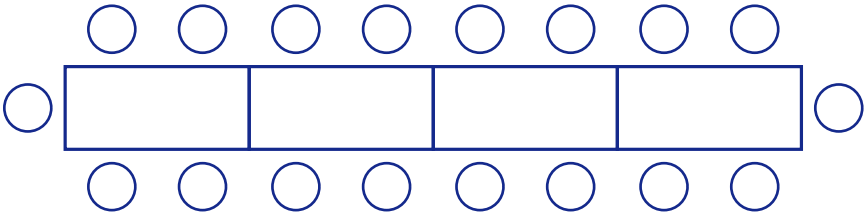
  or
- with their longer sides touching.

Mrs Smith wants to use the **least number of tables** possible.
Draw a diagram in the space below to show how the tables and chairs for the 18 people at the party should be arranged. [2]

3310U201 09

4 tables joined by their shorter sides:

2 chairs on each long side × 8 = 16, plus 1 chair at each end = 18 chairs



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3. (a) The Royal National Lifeboat Institution (RNLI) bought a new lifeboat.
The lifeboat was funded as follows:

- 2% from government sources
- 94% from donations
- 4% from other sources.

The new lifeboat cost £2.2 million.

How much of the cost of this lifeboat was funded from government sources?
Write your answer in figures only. [3]

£2.2 million = £2 200 000

Government sources = 2% of 2 200 000 = 0.02 × 2 200 000

= 44 000

£ 44000

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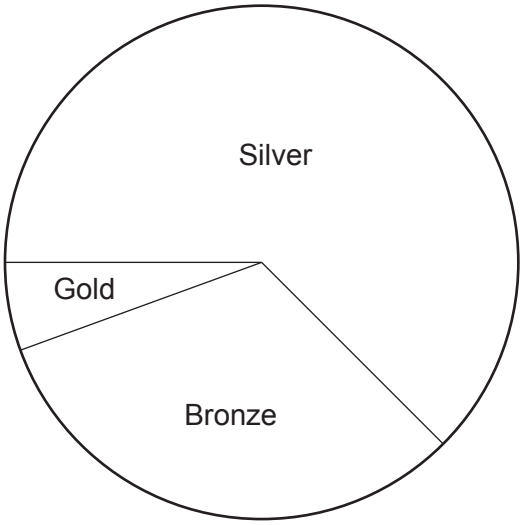
(b) 1800 medals were awarded to RNLI crew members in recent years.
The distribution of the medals is shown accurately in the pie chart below.



(i) What fraction of the medals awarded were bronze?
Circle your answer. [1]

$\frac{135}{360}$ $\frac{245}{360}$ $\frac{65}{360}$ $\frac{115}{360}$ $\frac{75}{360}$

(ii) How many gold medals were awarded?
You must show all your working. [3]

Angle for gold (measured) = 20°

Gold medals = 20 ÷ 360 × 1800

= 100 gold medals

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4. Viktor runs a plumbing company that is based abroad.

(a) In April 2022, the rate of VAT that Viktor had to pay on goods increased to 23%.
In May 2022, Viktor bought goods worth 4000 euros before VAT.
If he had bought the goods before April, the VAT would have been 800 euros.

How much more VAT did Viktor pay on the goods in May than he would have done if he had bought them before April? [3]

VAT in May = 23% of 4000 = 0.23 × 4000 = 920 euros

Extra VAT = 920 − 800 = 120 euros

120 euros

(b) Viktor pays 3600 euros towards his tax bill.
The exchange rate is £1 = 1.11 euros.
How much is 3600 euros in pounds?
Give your answer correct to the nearest penny. [2]

3600 ÷ 1.11 = 3243.243243...

= £3243.24 (to the nearest penny)

£ 3243.24

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5. (a) Iwan recorded his gas usage for a week.
His meter reading was 21 345 kWh at the start of the week.
His meter reading was 21 640 kWh at the end of the week.

Gas costs 7.2p per kWh.
VAT at 5% is payable on the cost of any gas used.

Calculate the total cost of Iwan's gas for the week.
You must show all your working. [5]

Gas used = 21 640 − 21 345 = 295 kWh

Cost before VAT = 295 × 7.2p = 2124p = £21.24

VAT = 5% of £21.24 = 0.05 × 21.24 = £1.062

Total cost = £21.24 + £1.062 = £22.302

= £22.30 (to the nearest penny)

The total cost of Iwan's gas for the week is £22.30.

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(b) For the first 7 days of October, the mean daily outside temperature at midday where Iwan lives was 13·2°C.
The temperatures at midday for the next 2 days of October were 12·2°C and 12·4°C.

Calculate the total of the temperatures for the first 7 days.
Hence, calculate the mean midday temperature for the first 9 days of October.
You must show all your working. [4]

Total for the first 7 days = 13.2 × 7 = 92.4 °C

Total for the first 9 days = 92.4 + 12.2 + 12.4 = 117 °C

Mean for the first 9 days = 117 ÷ 9 = 13 °C

The mean midday temperature for the first 9 days of October was 13 °C

(c) The plan of the streets where Iwan lives is shown below.

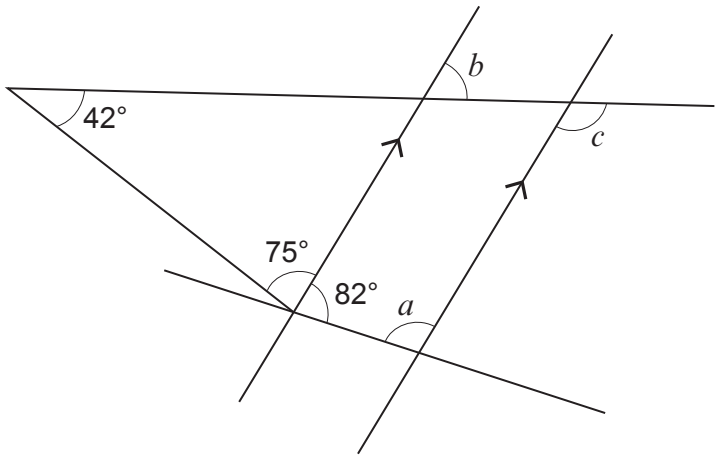

Diagram not drawn to scale

Find the size of each of the angles a, b and c. [3]

a = 180 − 82 = 98° (co-interior angles add up to 180°)

b = 180 − 42 − 75 = 63° (angles in a triangle, vert. opposite) c = 180 − 63 = 117°

a = 98 ° b = 63 ° c = 117 °

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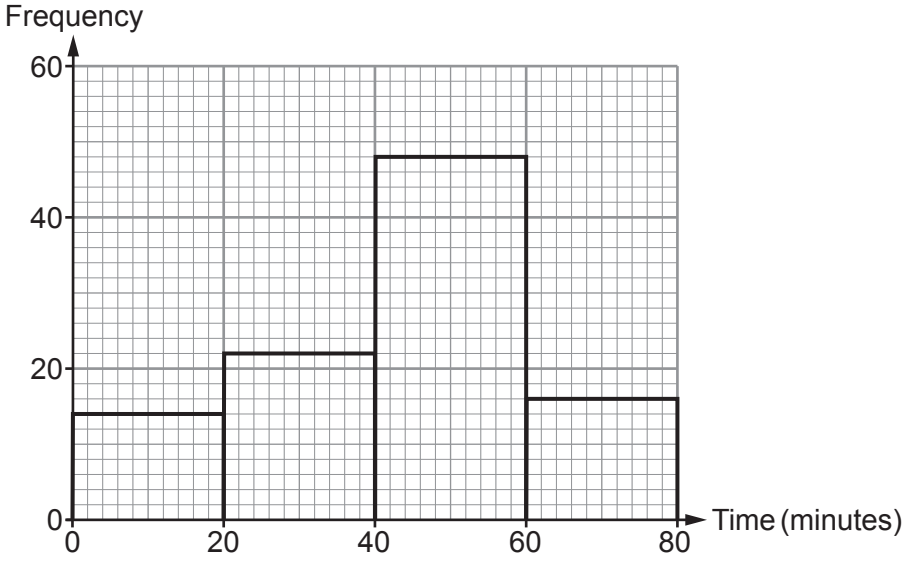
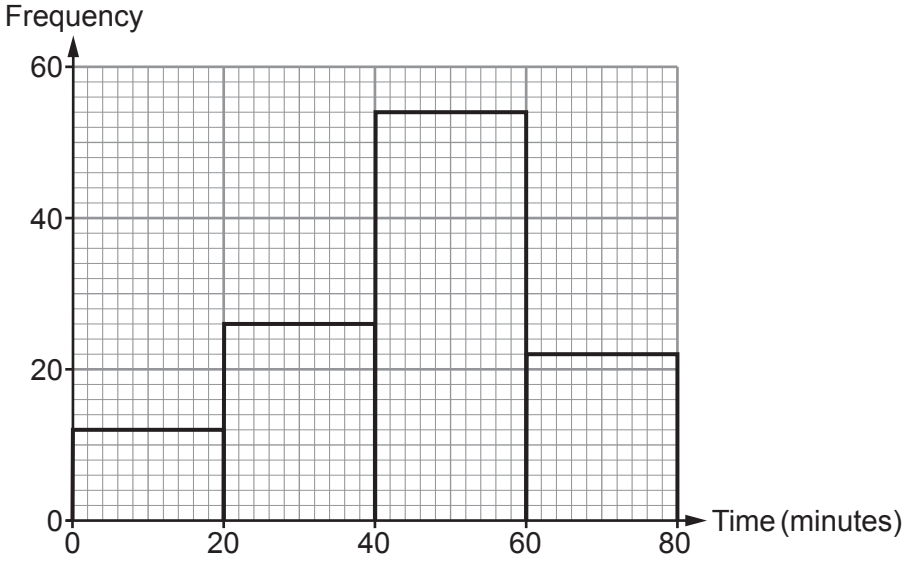
6. The frequency diagrams below show the lengths of time that men and women spent training in the gym on Friday.

Time spent training – Men



Time spent training – Women



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(a) Freddie says he spent exactly 1 hour 25 minutes training in the gym on Friday. Explain how you know that Freddie is not telling the truth. [1]

The diagram only goes up to 80 minutes, so nobody trained for longer than 80 minutes. 1 hour 25 minutes = 85 minutes, which is more than 80 minutes.

(b) How many men spent less than 20 minutes training in the gym on Friday? Circle your answer. [1]

12 14 54 6 20

(c) How many women spent less than 40 minutes training in the gym on Friday? Circle your answer. [1]

14 26 34 38 76

(d) Gwen says,

"A greater **proportion** of women than men spent between 40 and 60 minutes training in the gym on Friday."

Is Gwen's statement true or false?

True ☐ False ☑

You must show all your working to support your answer. [5]

Total men = 14 + 22 + 48 + 16 = 100

Total women = 12 + 26 + 54 + 22 = 114

Men 40 to 60 min: 48 out of 100 = 48 ÷ 100 = 0.48 = 48%

Women 40 to 60 min: 54 out of 114 = 54 ÷ 114 = 0.47368... = 47.4%

48% > 47.4%, so a greater proportion of men than women spent between 40 and 60 minutes training. Gwen's statement is false.

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7. Lena flew from Havana Airport in Cuba to Gatwick Airport in the UK. She then drove home from Gatwick Airport.

When it is 09:40 in Havana, it is 14:40 on the same day in Gatwick.

It took 9 hours 15 minutes to fly from Havana to Gatwick.
Lena's flight left Havana on Monday at 17:40 local Havana time.

On what day and at what time did this flight arrive in Gatwick?
Give your answer in UK time. [4]

Time difference = 14:40 − 09:40 = 5 hours (Gatwick is ahead)

Arrival in Havana time = 17:40 + 9 h 15 min = 02:55 on Tuesday

Arrival in UK time = 02:55 + 5 hours = 07:55 on Tuesday

Day Tuesday Time 07:55

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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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