

GCSE – NEW

3310U30-1

**MATHEMATICS – NUMERACY
UNIT 1: NON – CALCULATOR
INTERMEDIATE TIER**

**THURSDAY,
25 MAY 2017 – MORNING**

**1 hour 45 minutes
(plus your additional
time allowance)**

**THE USE OF A
CALCULATOR IS NOT
PERMITTED IN THIS
EXAMINATION**

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

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

ADDITIONAL MATERIALS

A ruler, a protractor and a pair of compasses may be required.

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

A spare Diagram Booklet.

Model for Question 4.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided.

If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3.14

(Turn over)

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

1. Look at the information for Question 1 in the separate Diagram Booklet.

Siân wrote the information shown.

Gareth asked,

‘What was the mean number of cars in the car park at **10 a.m.** for these **7** days?’

Complete Siân’s reply to Gareth’s question.

You must list the **7** numbers Siân recorded and show all your working.

‘The mean number of cars in the car park at **10 a.m.** for these **7** days was _____ cars.’

(Turn over)

(Turn over)

2. Look at the diagram for Question 2 in the separate Diagram Booklet.

The diagram shows a travel graph.

Eleri and Yvon are sisters.

They both live at CWM UCHEL.

They do not go to the same school.

The graph represents each of their journeys to school and back.

Key: — — — — — represents Eleri's journey

————— represents Yvon's journeys

- (a) At what time did Yvon arrive home from school?

Circle your answer.

14:45	15:15	15:30	15:45	16:00
-------	-------	-------	-------	-------

[1 mark]

(Turn over)

Question 2 continued

2. (b) Eleri cycles along a straight road to school and back.

How far does she cycle when going to school and back in one day?

Circle your answer.

6 km	8 km	9 km	12 km	16 km
------	------	------	-------	-------

[1 mark]

(Turn over)

Question 2 continued

2. (c) Martha looks at the graph and says,

**‘The school Eleri attends is 2 km
from Yvon’s school.’**

Is this true?

Certainly true

☐

Certainly false

☐

Can’t tell

☐

Give a reason for your answer.

[1 mark]

(Turn over)

- 3. IN THIS QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.**

Look at the information for Question 3 in the separate Diagram Booklet.

The information shows charges for MAES ALUN CAMPING.

Rhodri and Lars are planning a camping holiday, staying at MAES ALUN CAMPING.

They are going to

- take only one tent between them,**
- take a tent covering a rectangular ground area, measuring 2.5 metres by 4.4 metres,**
- both stay for a total of 12 nights.**

Their holiday is just 8 weeks away.

They EACH plan to save £15 per week from now until their holiday in 8 weeks' time.

continued on the next page . . .

(Turn over)

Question 3 continued

Will the amount they save be enough to pay for their holiday?

You must show all your working.

[8 marks + 2 marks OCW]

[illegible]

(Turn over)

4. Look at the pricing chart for Question 4 in the separate Diagram Booklet.

Lazar wants to send a package to Germany. He looks at pricing charts for three different companies, PARCELMAX, DIRECTGO and PACK2SAVE.

Ask for the model for Question 4.

The model is NOT made to scale.

Lazar's parcel is a cuboid measuring 10 cm by 20 cm by 30 cm.

- (a) Find the cost of sending the parcel for each of the three different companies. Give each of your answers in pounds (£).
- (i) PARCELMAX

[2 marks]

(Turn over)

Question 4 (a) continued

4. (a) (ii) DIRECTGO

[3 marks]

(iii) PACK2SAVE

(Turn over)

[4 marks]

continued on the next page . . .

(Turn over)

Question 4 continued

- 4. (b) What is the PERCENTAGE SAVING that Lazar will make by choosing the cheapest option rather than the most expensive option?**

[2 marks]

(Turn over)

5. (a) Jasmine entered herself, Sophie and Bryn as a group in a talent contest.

Bryn only had a minor part.

Bryn, Sophie and Jasmine won the contest.

They shared the prize money in the ratio $2 : 6 : 7$ with Bryn getting the smallest share.

Jasmine won £560, the largest share.

- (i) How much money did Bryn and Sophie each win?

(Turn over)

Bryn receives £ _____

Sophie receives £ _____

[4 marks]

5. (a) (ii) Jasmine gave **15%** of her winnings to charity.
How much did Jasmine have left?

[2 marks]

(Turn over)

Question 5 continued

5. (b) The talent contest is held once a year. Every year, the cost of putting on the talent contest increases by **10%** of the previous year's cost.

In summer **2014** the cost was **£6600**

Calculate the cost of putting on the summer **2017** talent contest.

You must show all your working.

(Turn over)

(Turn over)

6. Look at the diagrams for Question 6 in the separate Diagram Booklet.

The diagrams show frequency polygons.

A survey was carried out to find how much time a group of **16** – year – old students and a group of **18** – year – old students spent using social media.

Diagram (i) shows the frequency polygon for **16** – year – old students and

Diagram (ii) shows the frequency polygon for **18** – year – old students.

The frequency polygons, which use equal time intervals, illustrate the results.

- (a) How many **16** – year – old students took part in the survey?

Circle your answer.

60	70	210	230	2300
----	----	-----	-----	------

Question 6 continued

6. (b) How many more **16** – year – old students than **18** – year – old students spent between **15** minutes and **25** minutes using social media?
Circle your answer.

20	40	60	100	250
----	----	----	-----	-----

[1 mark]

(Turn over)

Question 6 continued

6. (c) Wesley says,

‘The 16 – year – old students generally spent about the same time using social media as the 18 – year – old students.’

**Using the frequency polygons,
how would you explain to Wesley
that his statement is not true?**

(Turn over)

[1 mark]

(Turn over)

- 7. Look at the diagrams for Question 7 in the separate Diagram Booklet. The diagrams are NOT drawn to scale.**

Kari is making a jigsaw puzzle.

She has designed the pattern on a piece of paper.

Kari plans to make each piece of the jigsaw a different colour.

Part of her plan is shown in Diagram (i).

Kari now sketches Diagram (ii) to show the red piece of the jigsaw.

She shows some extended lines and indicates all the angles she needs to find.

Find the 4 missing angles in the red piece of the jigsaw.

On Diagram (iii) in the separate Diagram Booklet, draw the red piece of Kari's jigsaw accurately.

One side has been drawn for you.

e = _____ ☐

f = _____ ☐

g = _____ ☐

h = _____ ☐

[6 marks]

(Turn over)

8. Bethan builds a rectangular sheep pen.
The diagram is NOT drawn to scale.



- (a) The perimeter fence of the sheep pen
is **18 m** long.

It costs her **£1.10** for every **0.5** metres
of fencing used to make the sheep pen.

- (i) Calculate the cost of the fencing
used to make this sheep pen.

(Turn over)

Cost is £ _____

[2 marks]

8. (a) (ii) The length of Bethan's sheep pen is two times its width.
Find the length and width of this sheep pen.
You must show your working.

(Turn over)

Length is _____ metres

Width is _____ metres

[2 marks]

8. (b) Bethan decides to build a new sheep pen.
The perimeter fence of the new sheep pen
is **16 m** long.

The length of the new sheep pen
is **3 metres** longer than the width.

Form an equation and solve it to find
the dimensions of this new sheep pen.

(Turn over)

Length is _____ metres

Width is _____ metres

[3 marks]

9. Ollie and Josef both have jobs in a workshop that makes decorations. They make decorations using small squares of stained glass.

- (a) Look at the diagram for Question 9 (a) in the separate Diagram Booklet.

Ollie has made the decorations shown in the diagram.

He labels the first decoration **D1**.

He labels the next **3** decorations in order, **D2, D3** and **D4**.

He continues to make decorations and labels, following this pattern.

continued on the next page . . .

Question 9 (a) continued

- 9. (a) (i) After making decoration D5,
Ollie notices he only has 10 small
squares of stained glass left.
How many MORE squares of stained
glass will Ollie need to make
decoration D6?**

[2 marks]

continued on the next page . . .

(Turn over)

Question 9 (a) continued

- 9. (a) (ii) Ollie uses a rule to work out how many squares he needs for each decoration. He states that to make decoration D10 he would need 55 squares. Is Ollie correct? You must show your working.**

[1 mark]

(Turn over)

Question 9 continued

9. (b) Look at the diagram for Question 9 (b) in the separate Diagram Booklet.

Josef has made the three decorations shown in the diagram using small squares of stained glass.

Josef labels these patterns **P1**, **P2** and **P3** in order.

Josef continues to make decorations following the pattern he has started.

- (i) How many MORE squares would he need to make pattern **P22** than to make pattern **P18**?

[1 mark]
(Turn over)

Question 9 (b) continued

9. (b) (ii) Josef has 22 squares.

Josef states,

**‘I think I can make one complete
decoration using ALL 22 squares,
with none left over.’**

Is Josef correct?

Yes

☐

No

☐

Give a reason for your answer.

[1 mark]

continued on the next page . . .

(Turn over)

Question 9 (b) continued

9. (b) (iii) Each small square of stained glass measures **0.5 cm** by **0.5 cm**.
The perimeter of one of Josef's decorations is **10 cm**.
Complete the label that Josef would use for this decoration.

P _____

[2 marks]

(Turn over)

10. Look at the diagram for Question 10 in the separate Diagram Booklet.

The diagram is a cumulative frequency diagram.

CAMBRIA AIRLINES has planes that can carry up to 70 passengers.

For safety, the crew practise the emergency exit procedures with a group of 70 passengers.

Every 10 seconds the safety officer records the total number of passengers who have left the plane.

He has displayed the results in the cumulative frequency diagram shown.

(a) Estimate the median time taken by the passengers to leave the plane.

_____ seconds

[1 mark]

(Turn over)

Question 10 continued

10. (b) How many passengers took more than **50** seconds to leave the plane?

Circle your answer.

10	20	30	40	50
----	----	----	----	----

[1 mark]

- (c) **CAMBRIA AIRLINES** has a policy that states the following.

‘In the event of an emergency exit procedure, at least **90%** of the **70** passengers must have left the plane within **1** minute.’

Did the practice emergency exit procedure meet the requirements of the airline’s policy?

You must show all your working.

(Turn over)

(Turn over)

- 11. Look at the diagram for Question 11 in the separate Diagram Booklet.**

The diagram is a set of box and whisker plots.

The box and whisker plots show the flow of water through a drain, measured in m^3/s

The flow of water was measured at 11 a.m. each day for the first 5 months of the year.

- (a) In which of the five months was the median flow of water the greatest?**

[1 mark]

- (b) In which of the five months was the range of the flow of water the greatest?**

[1 mark]

(Turn over)

Question 11 continued

- 11. (c) Iona is writing some statements for a report on the flow of water through the drain.**

Complete each of the statements given below.

- (i) 'Both the upper quartiles and medians in the months of _____ and _____ were the same.'**

[1 mark]

- (ii) '25% of the results in March show the flow of water was greater than _____ m^3/s .'**

[1 mark]

- (d) Look at the table for Question 11 (d) in the separate Diagram Booklet.**

Circle either TRUE or FALSE for each of the statements shown.

[2 marks]

(Turn over)

12. (a) A standard piece of **A4** paper is usually **0.08 mm** thick.

What is **0.08 mm** written in **METRES** in standard form?

Circle your answer.

8×10^4	8×10^{-4}	8×10^{-3}	8×10^3	8×10^{-5}
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[1 mark]

(Turn over)

Question 12 continued

12. (b) A piece of card is 1 mm thick.

A stack of these pieces of card

is 3×10^{-2} metres high.

**(i) Calculate how many pieces of card
there are in the stack.**

(Turn over)

[2 marks]

**12. (b) (ii) What assumption have you made
in answering (b) (i)?**

[1 mark]

(Turn over)

Question 12 continued

12. (c) In 2012 it was recorded that

- the total mass of the paper used for printing newspapers, in the world, was 2.88×10^7 TONNES,
- the world population was approximately 7.2×10^9 people.

Use this information to calculate the mass of paper per person used to print newspapers in 2012

Give your answer in kg PER PERSON.

(Turn over)

(Turn over)

Mass of paper: _____ kg per person
[4 marks]

END OF PAPER

TOTAL 80 MARKS

(Turn over)

Question number	Additional Pages, if required. Write the question number in the left - hand margin.

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MATHEMATICS – NUMERACY
UNIT 1: NON – CALCULATOR
INTERMEDIATE TIER

THURSDAY, 25 MAY 2017 – MORNING

Diagram Booklet

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

Question 1

Information

‘For the last 7 days I have recorded the number of cars parked in my local car park at 10 a.m. each day. This is what I found.

- The car park always had some cars parked in it.**
- The greatest number of cars was 11**
- The range was 8 cars.**
- The median was 9 cars.**
- The mode was 10 cars.**
- On one day, there were 6 cars in the car park.**
- On another day, there were 7 cars in the car park.’**

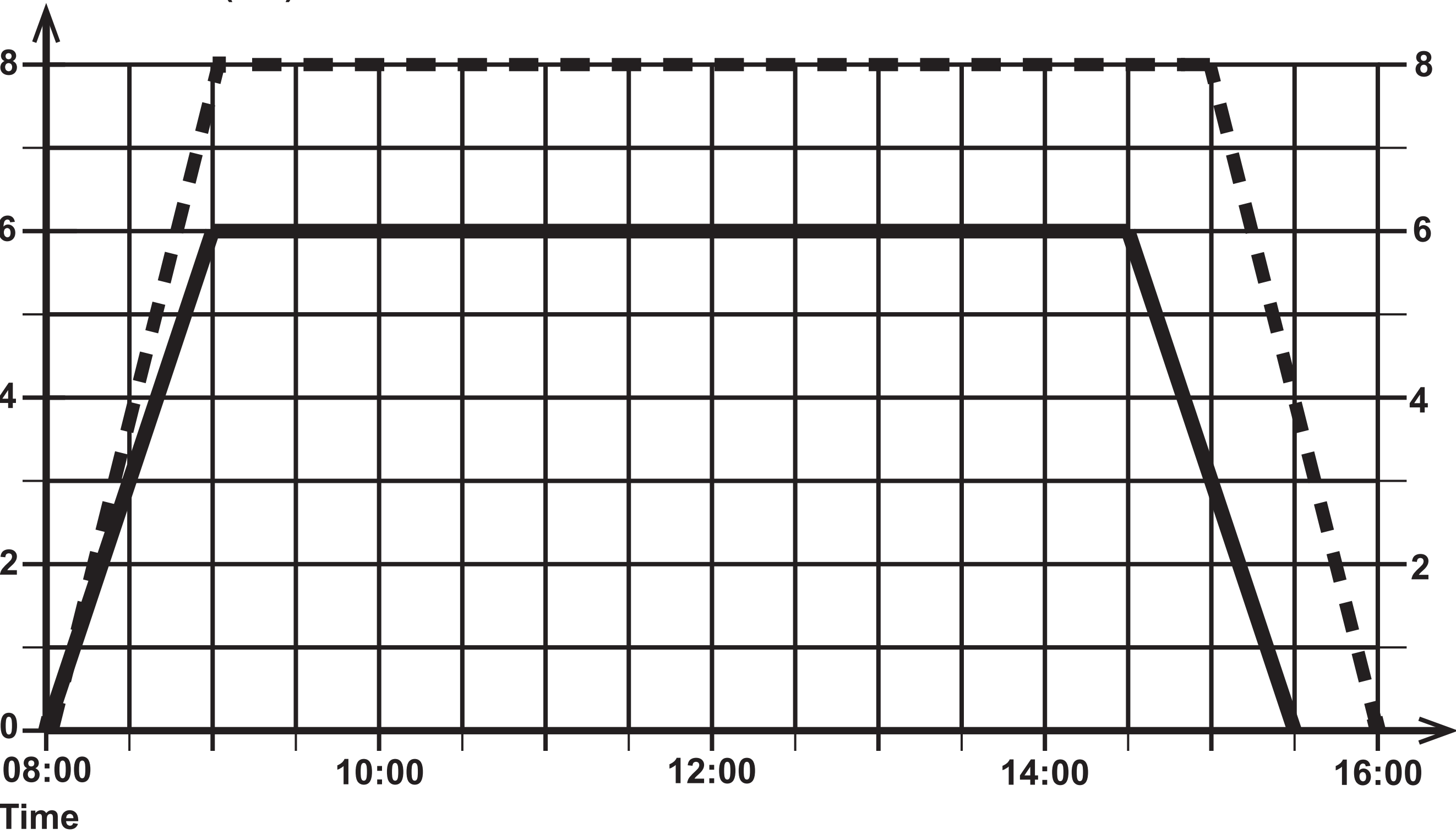
Question 2

Key:

--- represents Eleri's journeys

— represents Yvon's journeys

Distance from home (km)



Question 3
Information

MAES ALUN CAMPING CHARGES

Tents covering ground area:

- | | | |
|---|------|---------------|
| • less than or equal to 12 m ² | cost | £14 per night |
| • greater than 12 m ² | cost | £16 per night |

AND

Charge per person: £4 per night

Stay 5 nights and get the next night COMPLETELY FREE.

This means NO CHARGE for tents or people on EVERY 6th NIGHT.

Question 4

Pricing Chart

PARCELMAX

Total cost = Sum of the 3 dimensions in cm $\times$ £0.60

DIRECTGO

Total cost = Volume measured in cm³ $\times$ £0.01

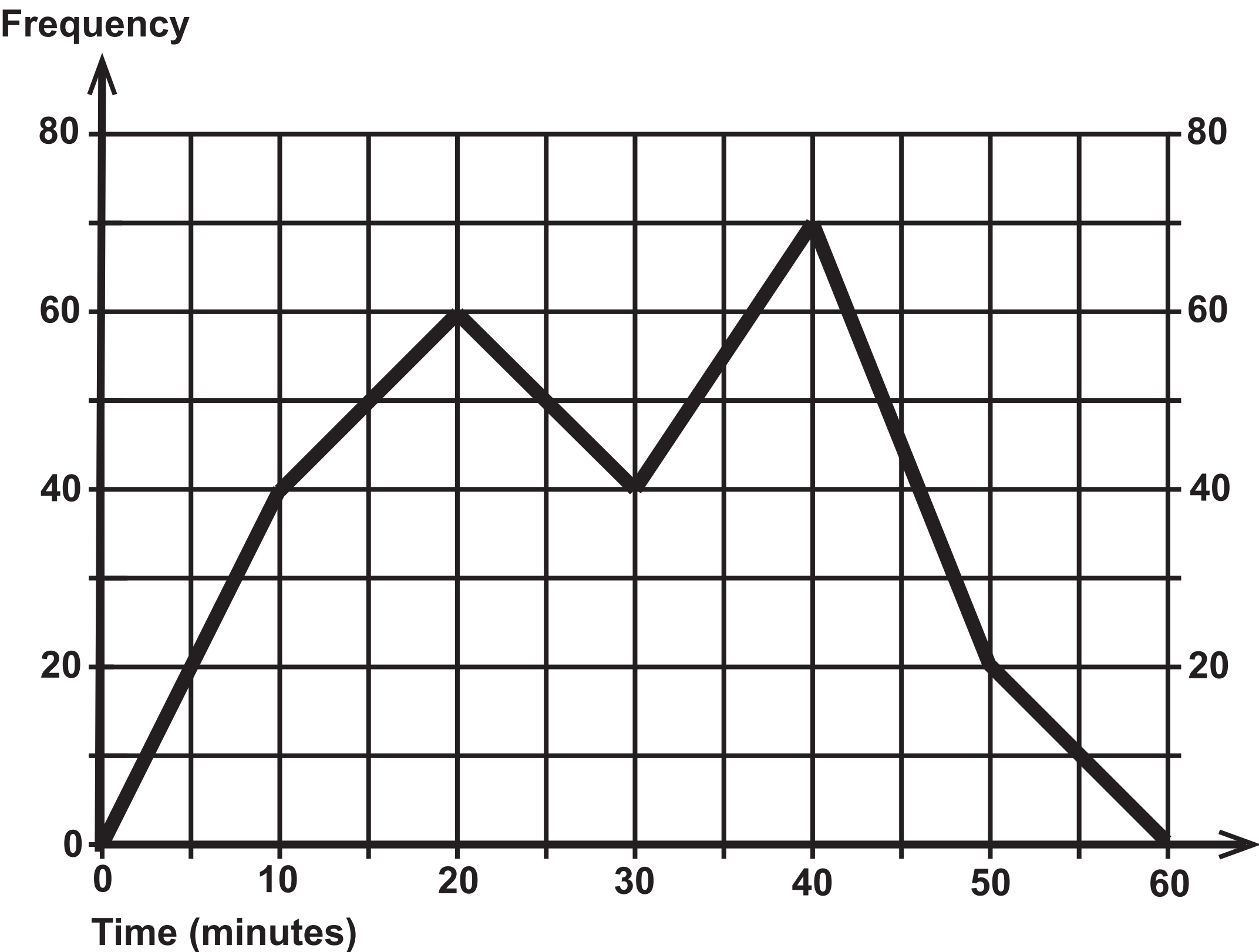
PACK2SAVE

Total cost = Total area of all 6 faces measured in cm² $\times$ £0.02

Question 6

Diagram (i)

16 – year – old students

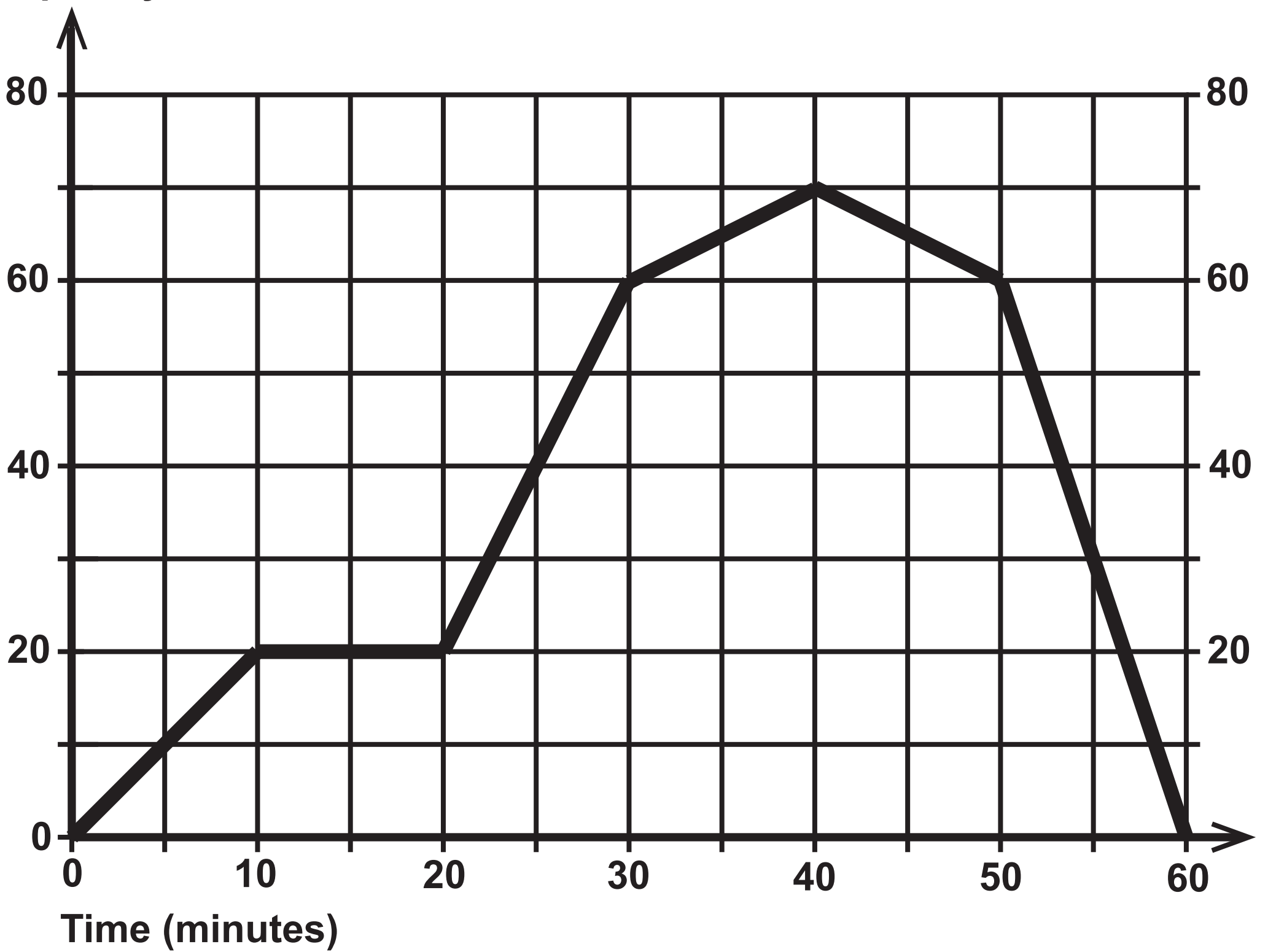


Question 6

Diagram (ii)

18 – year – old students

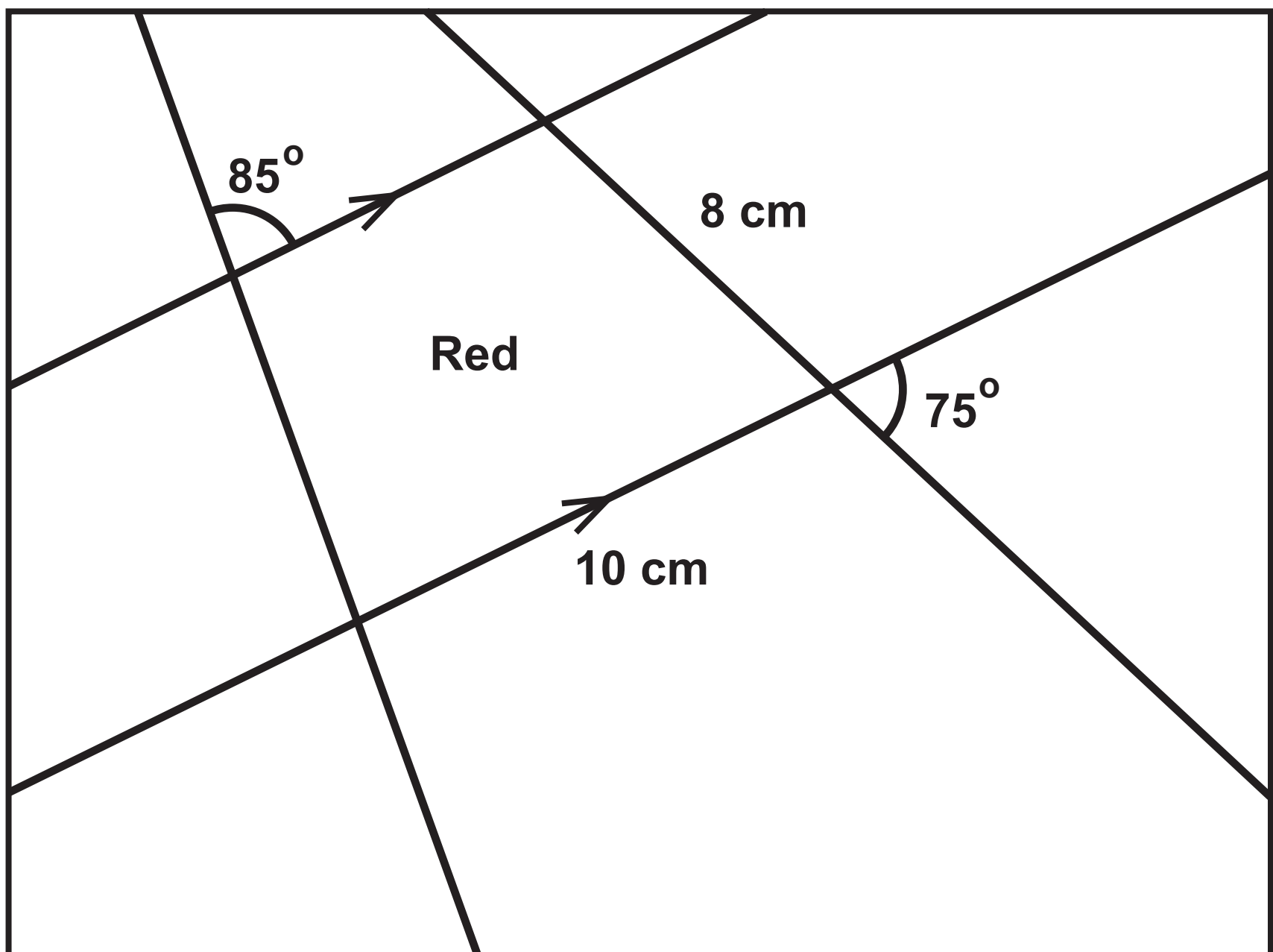
Frequency



Question 7

Diagram (i)

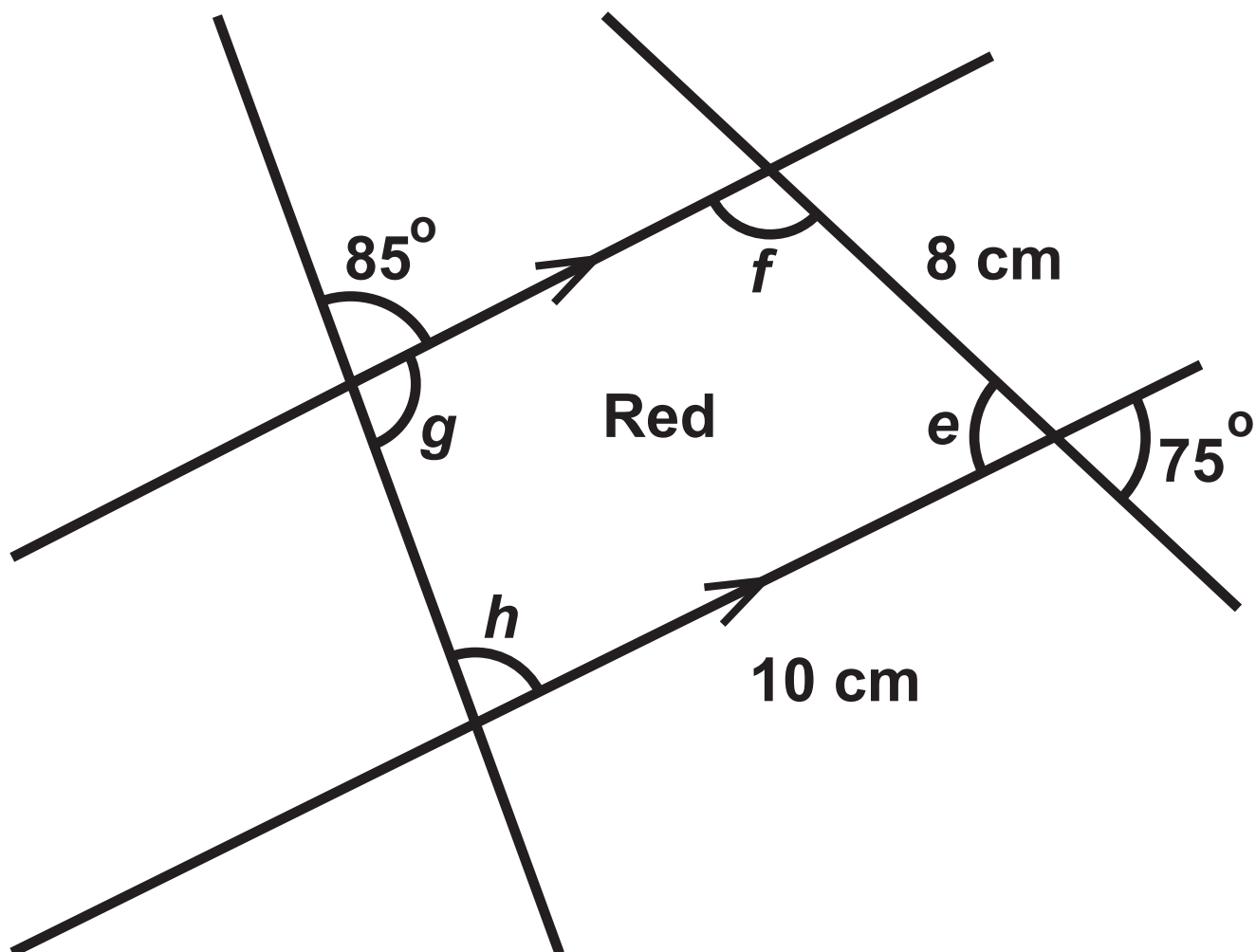
Diagram NOT drawn to scale



Question 7

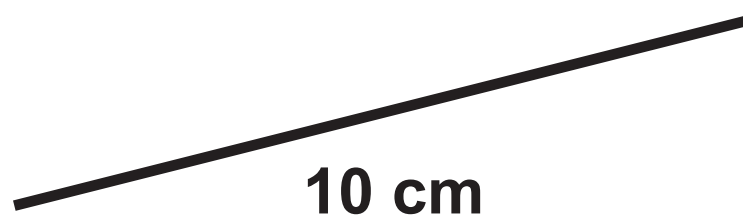
Diagram (ii)

Diagram NOT drawn to scale

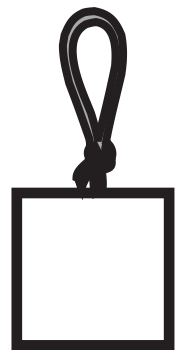


Question 7

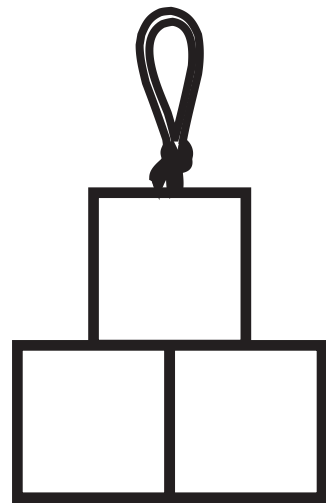
Diagram (iii)



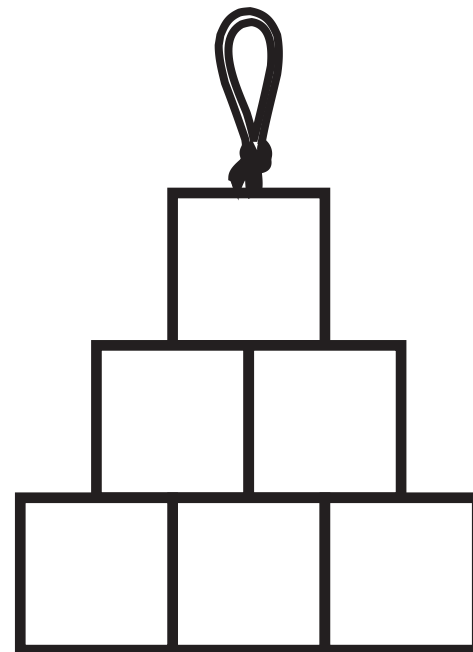
Question 9 (a)



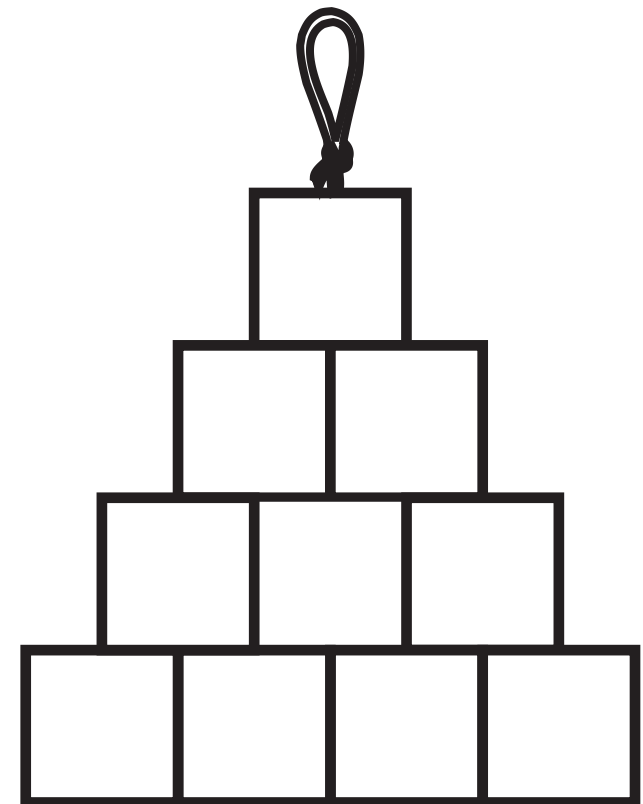
D1



D2

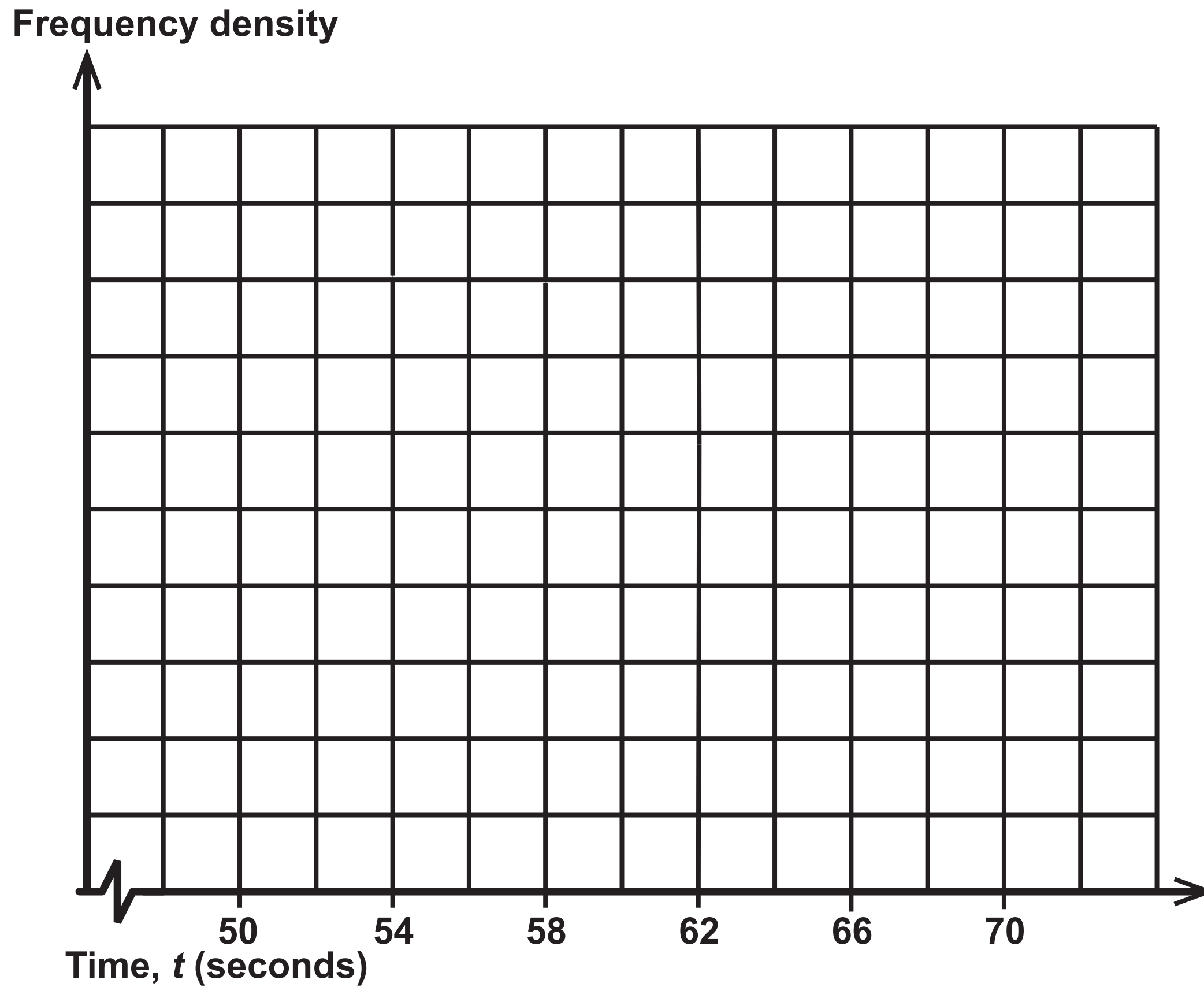


D3



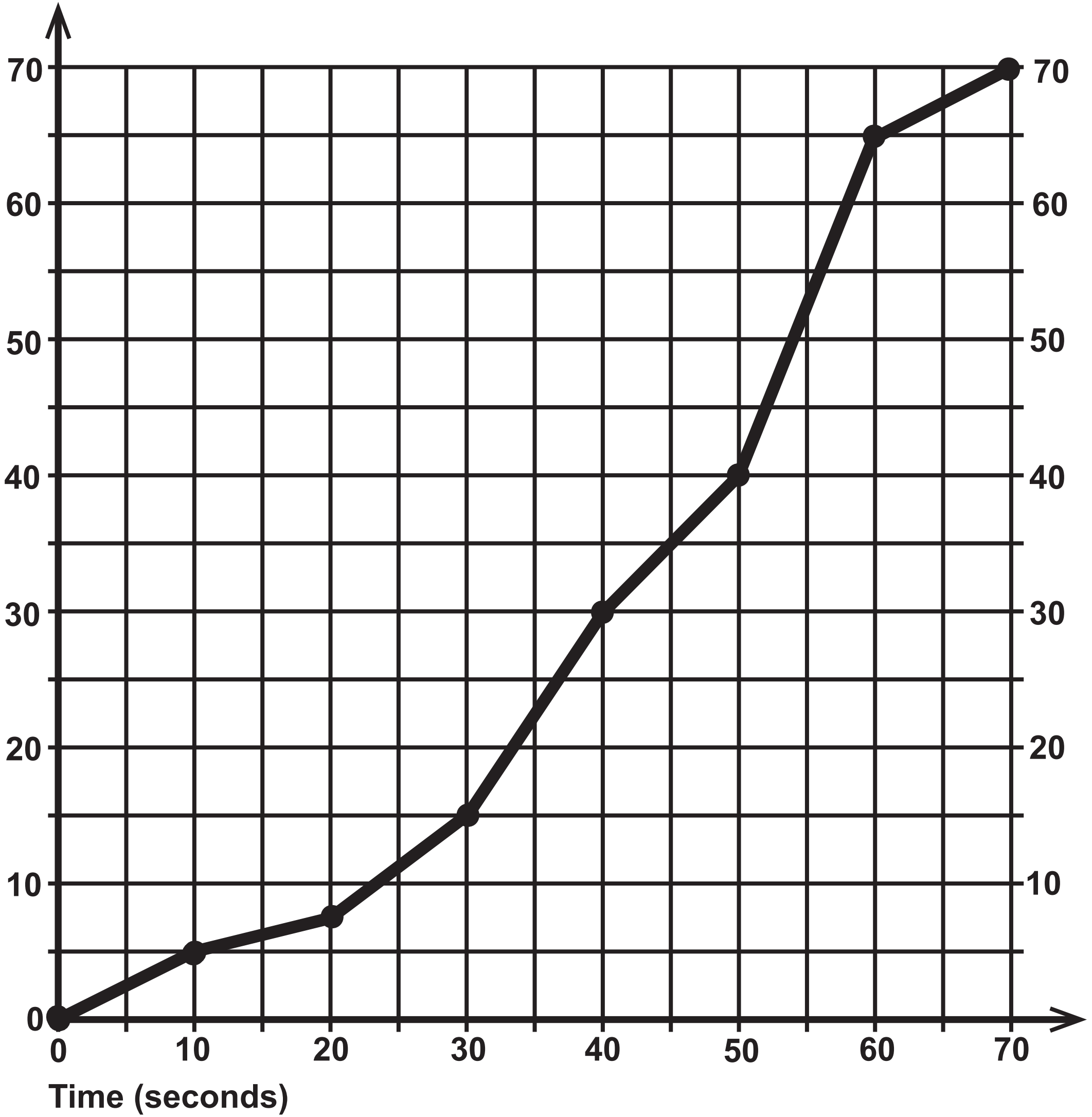
D4

Question 9 (b)



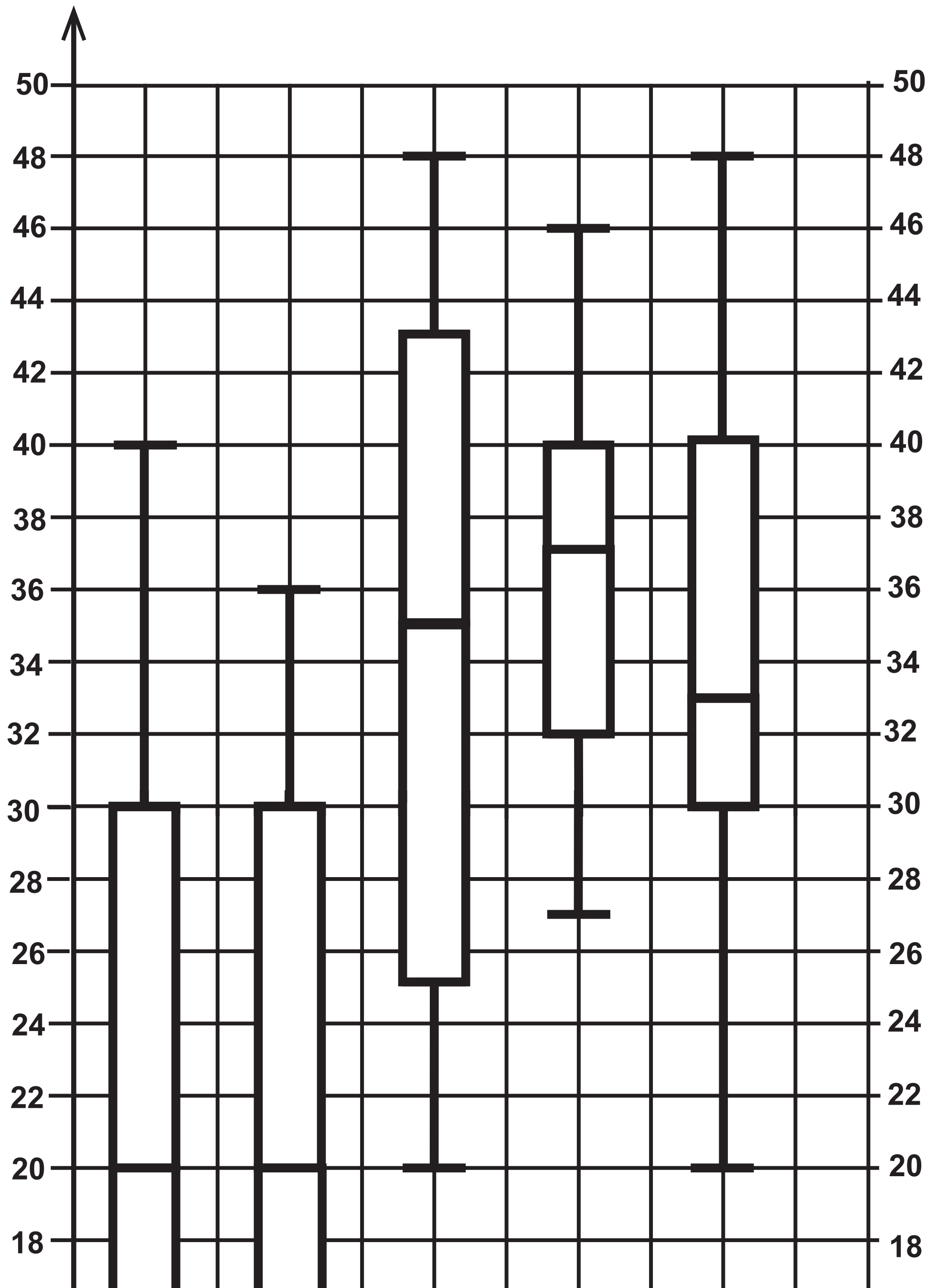
Question 10

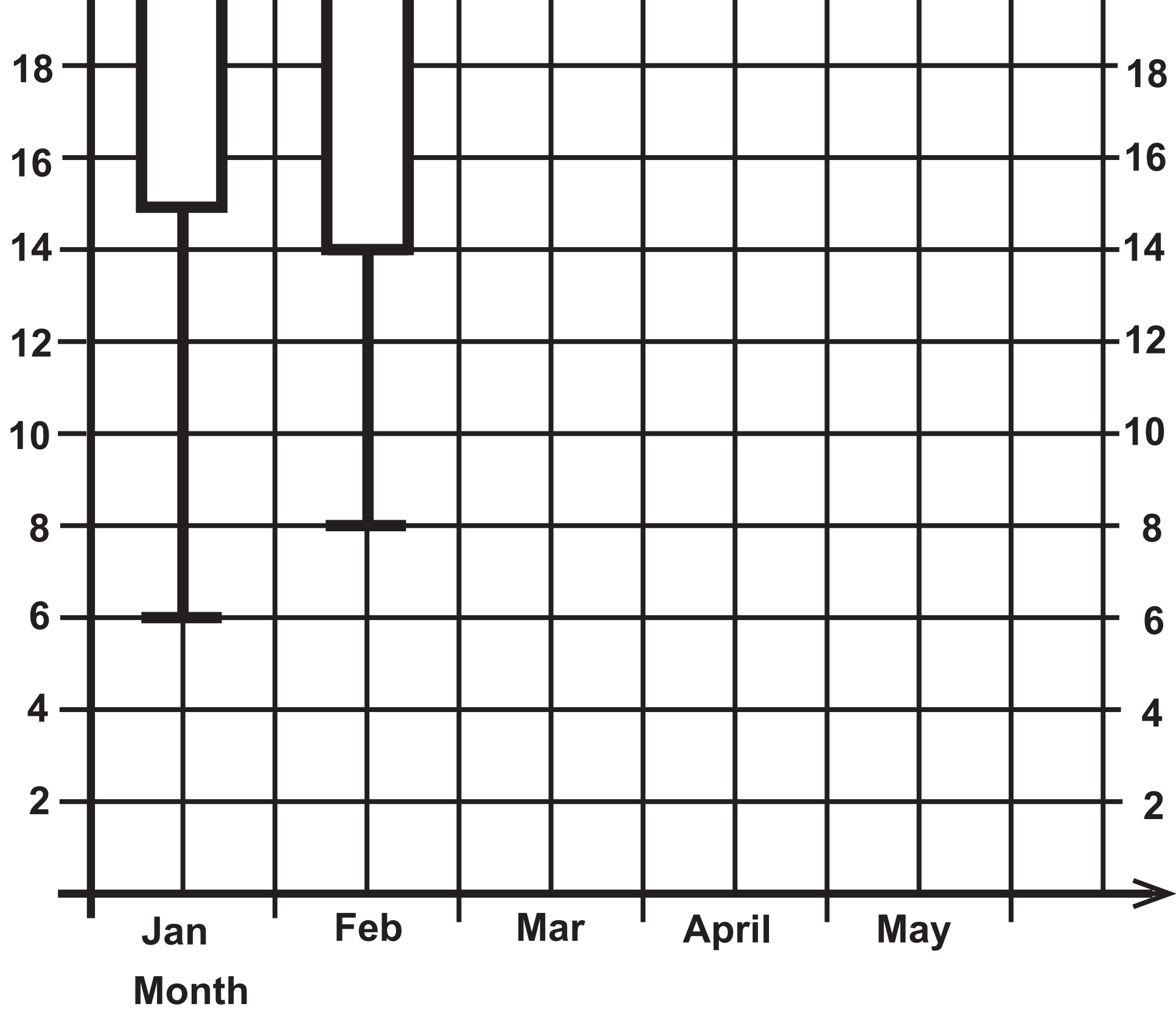
Cumulative frequency



Question 11

Flow of water (m^3/s)





Question 11 (d)

Table

25% of the results in January show the flow of water was less than $6 \text{ m}^3/\text{s}$	TRUE	FALSE
The units, m^3/s, measure the volume of water passing through the drain each second.	TRUE	FALSE
The mean flow of water in April was CERTAINLY greater than $36 \text{ m}^3/\text{s}$	TRUE	FALSE
The month with the greatest difference between the lower quartile and the median was May.	TRUE	FALSE

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MATHEMATICS – NUMERACY
UNIT 1: NON – CALCULATOR
INTERMEDIATE TIER

THURSDAY, 25 MAY 2017 – MORNING

Spare Diagram Booklet

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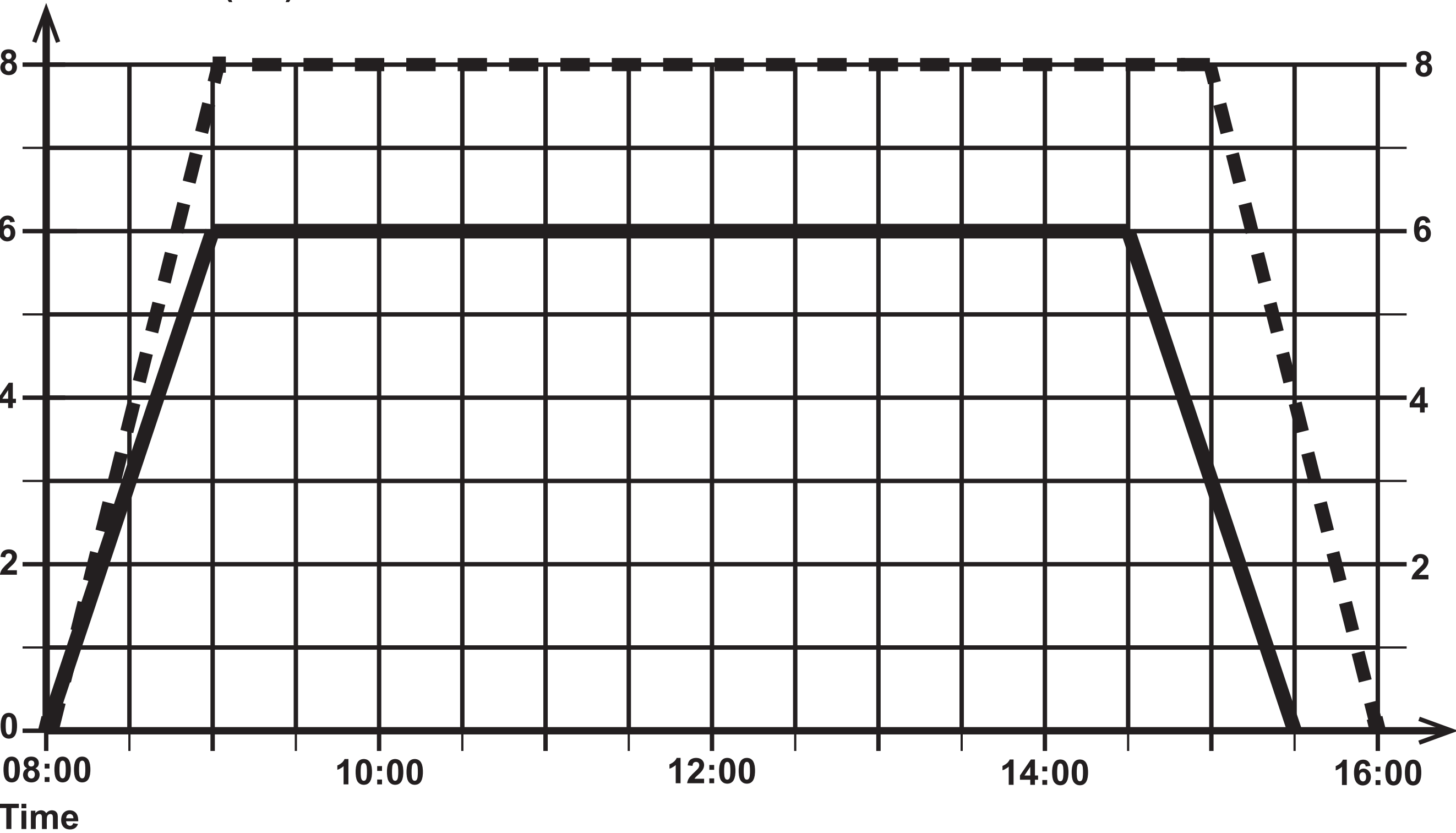
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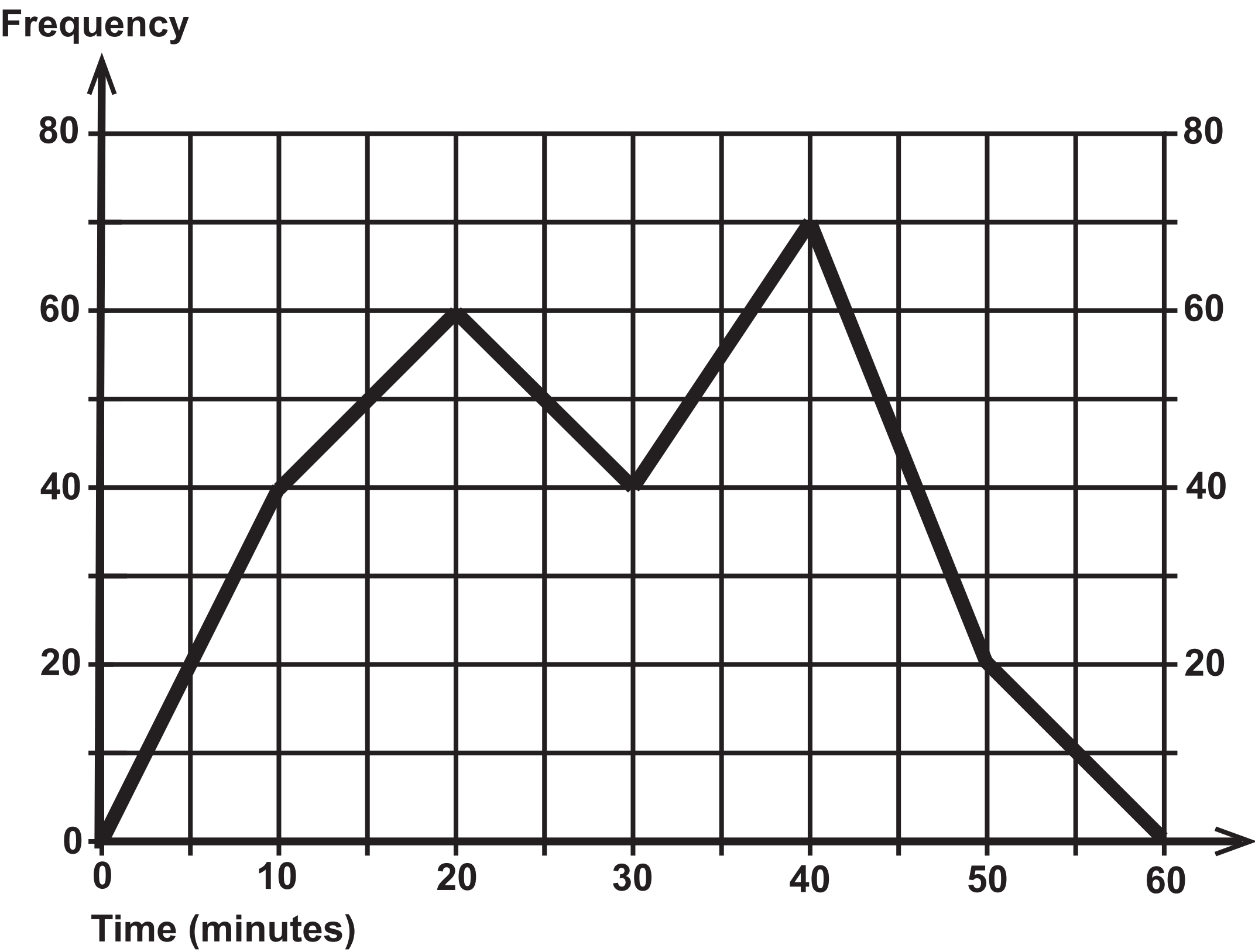
PACK2SAVE

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Question 6

Diagram (i)

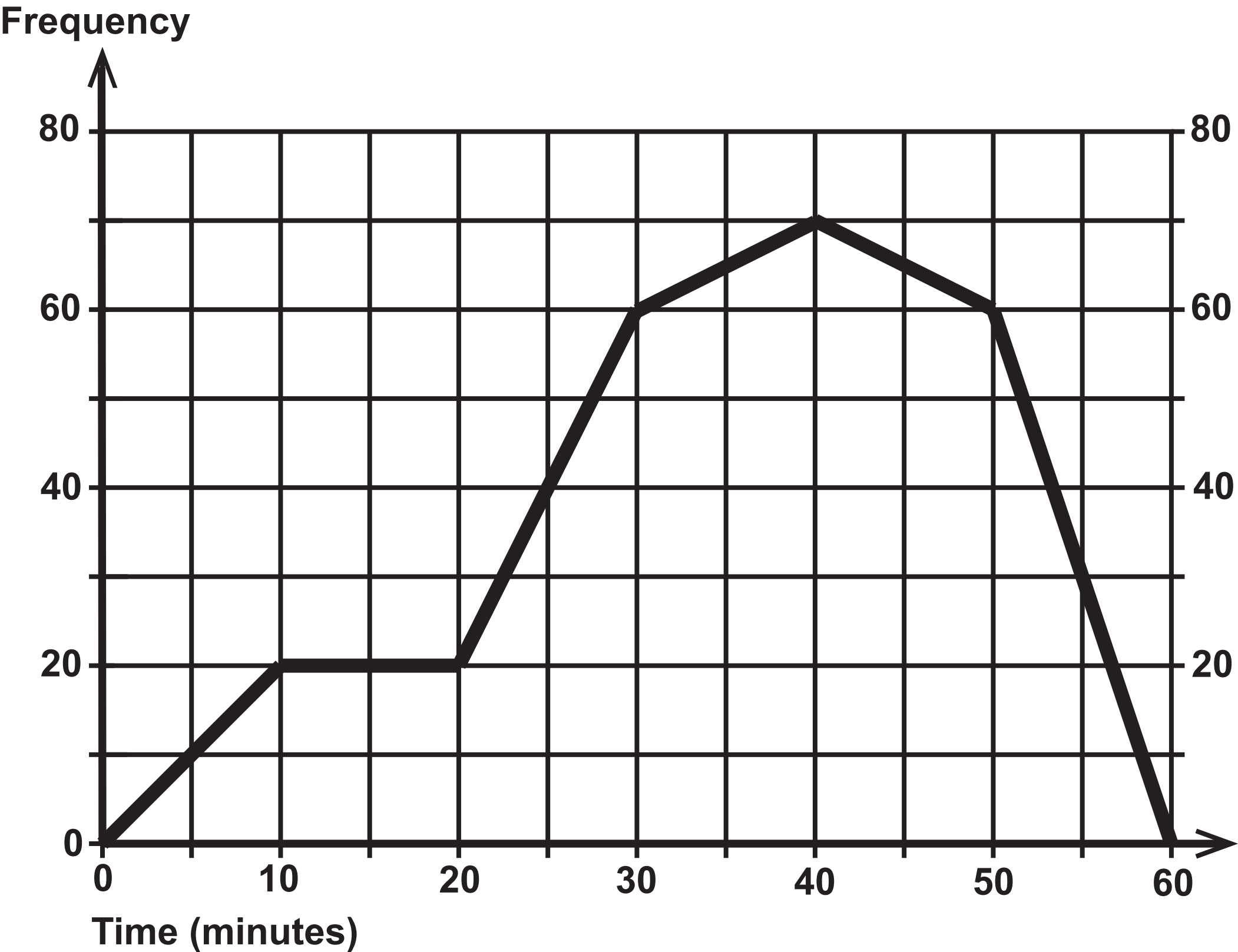
16 – year – old students



Question 6

Diagram (ii)

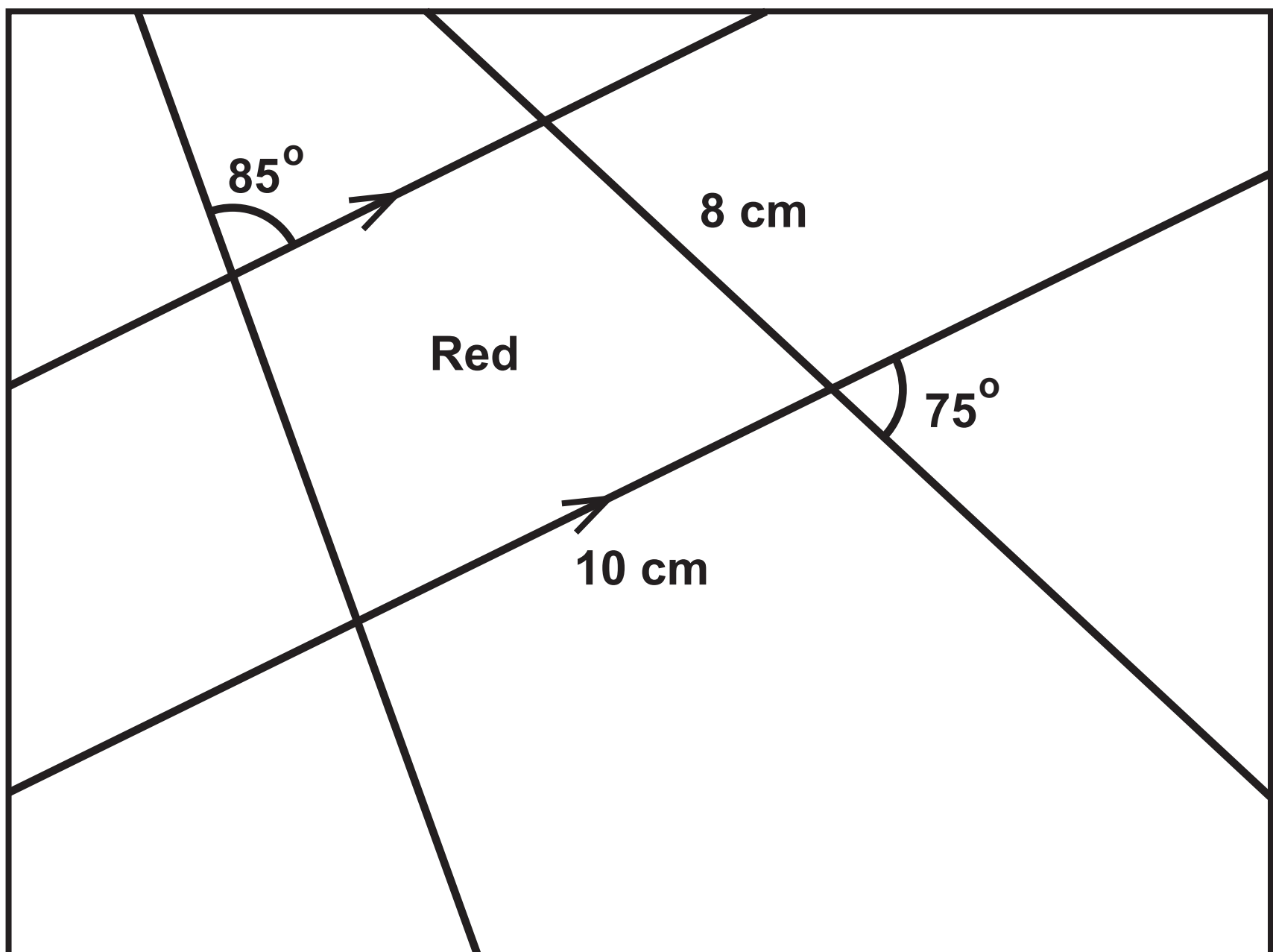
18 – year – old students



Question 7

Diagram (i)

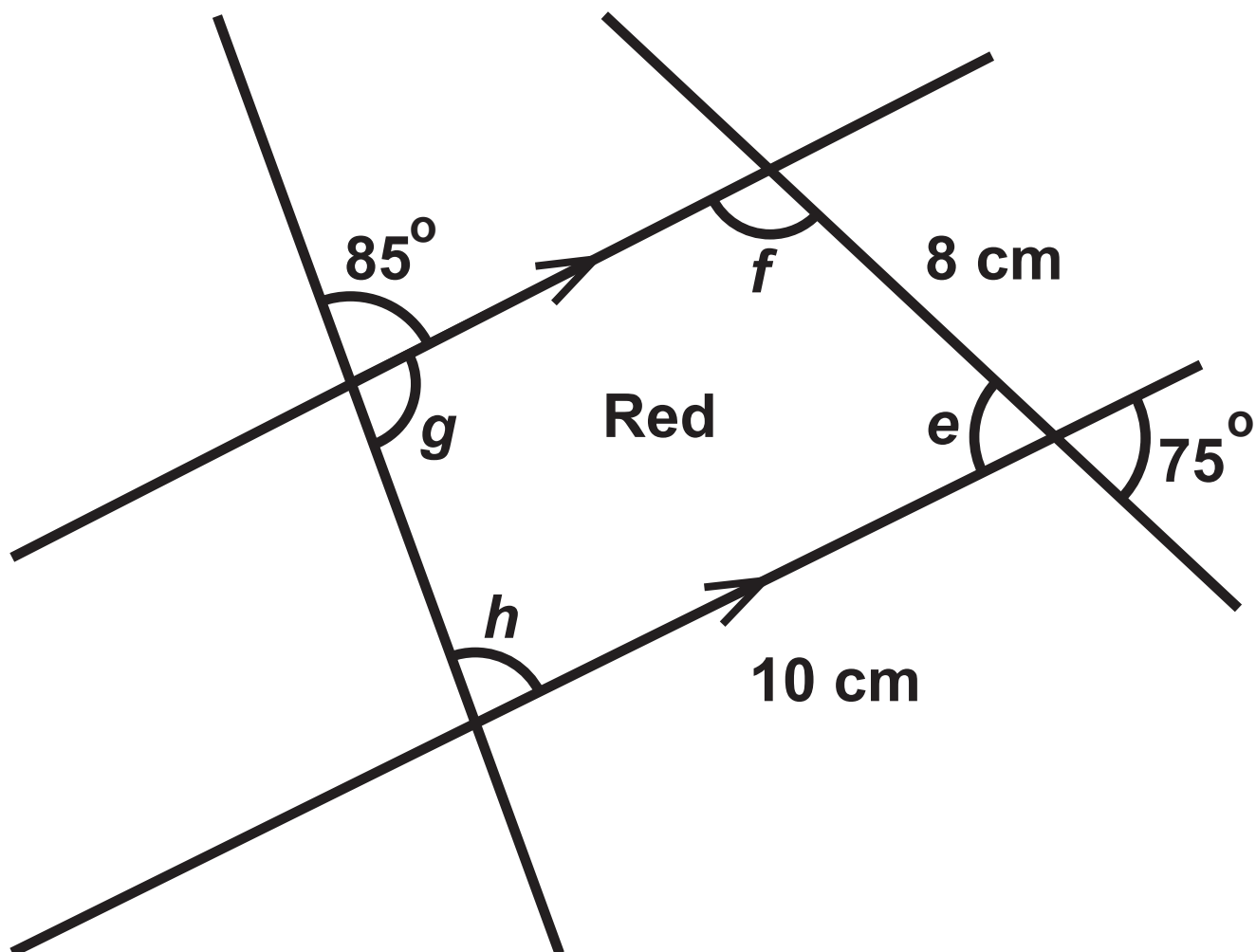
Diagram NOT drawn to scale



Question 7

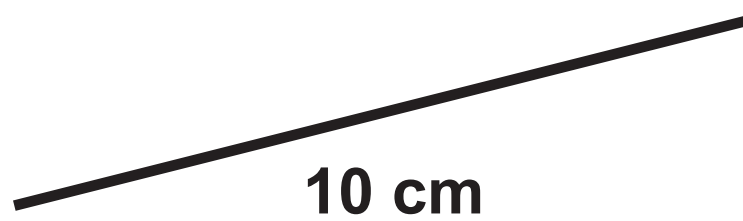
Diagram (ii)

Diagram NOT drawn to scale

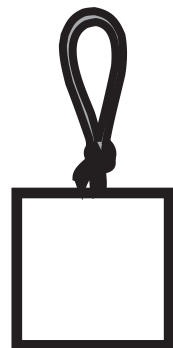


Question 7

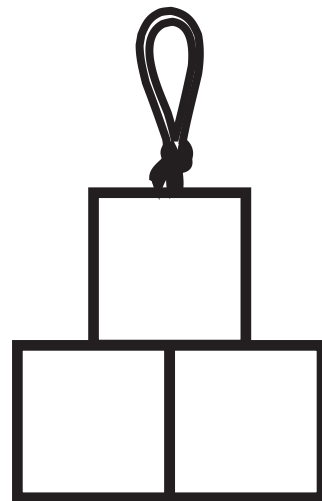
Diagram (iii)



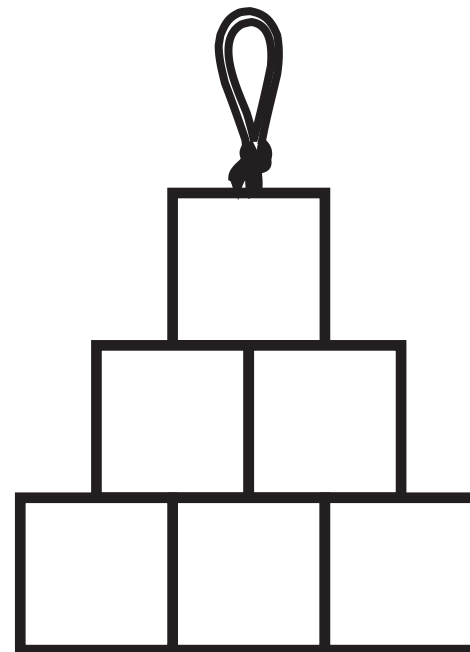
Question 9 (a)



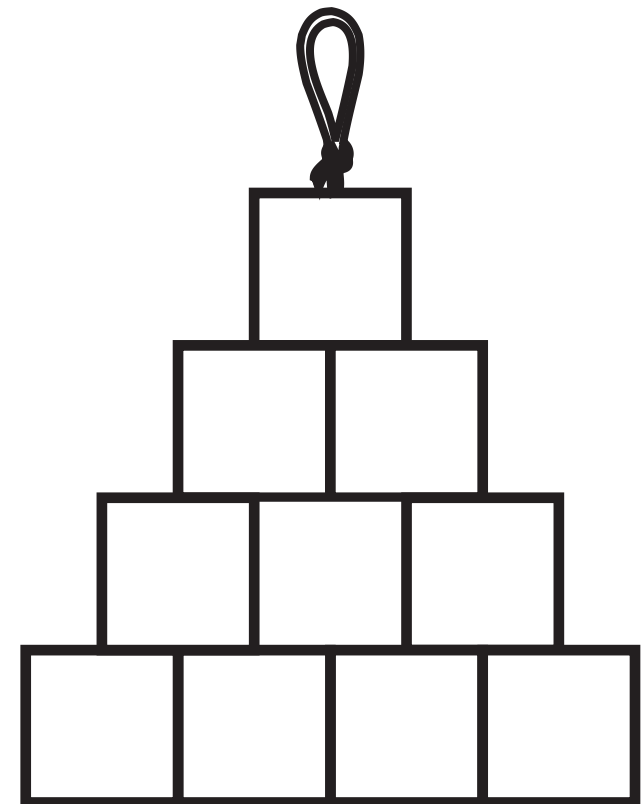
D1



D2

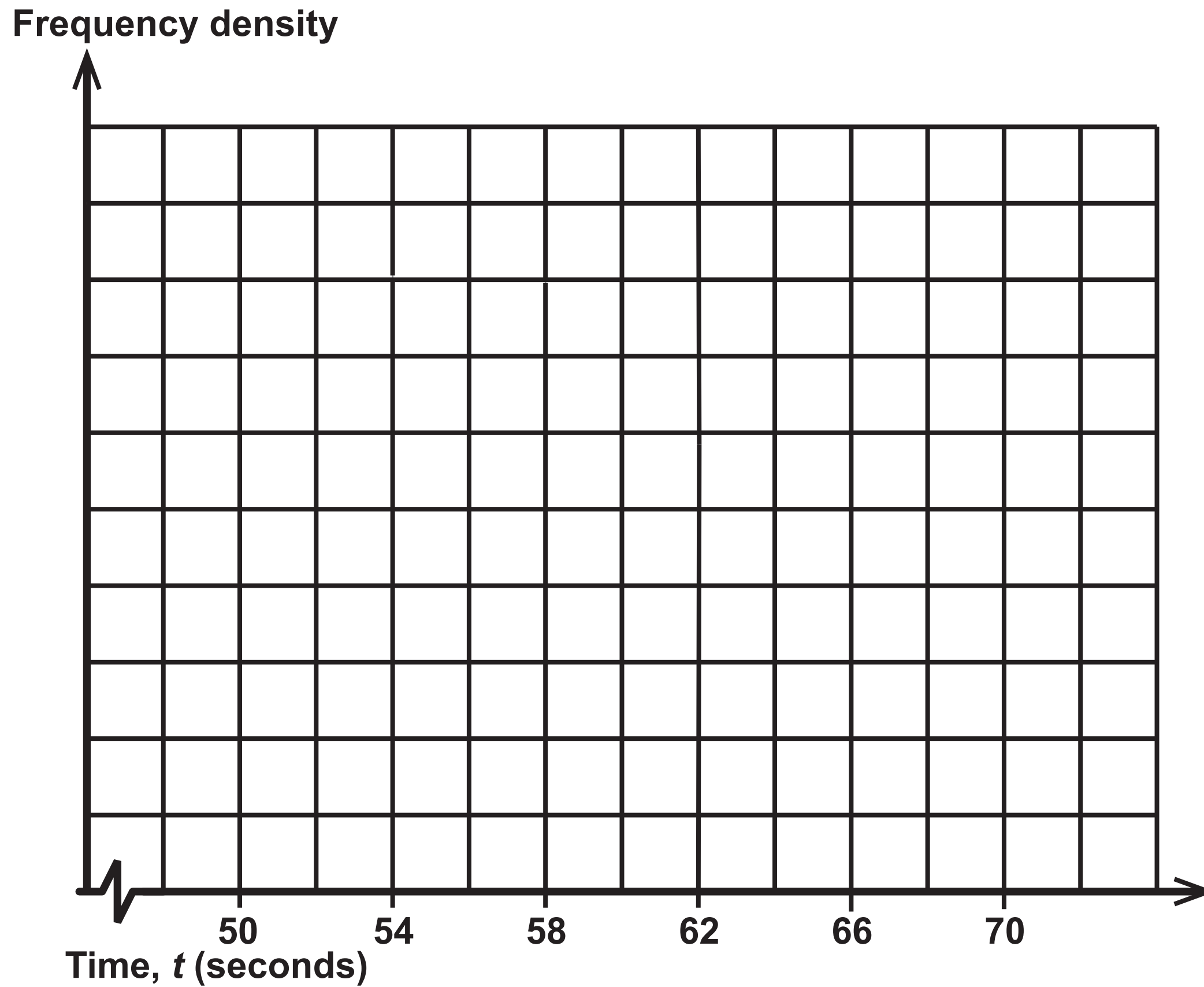


D3

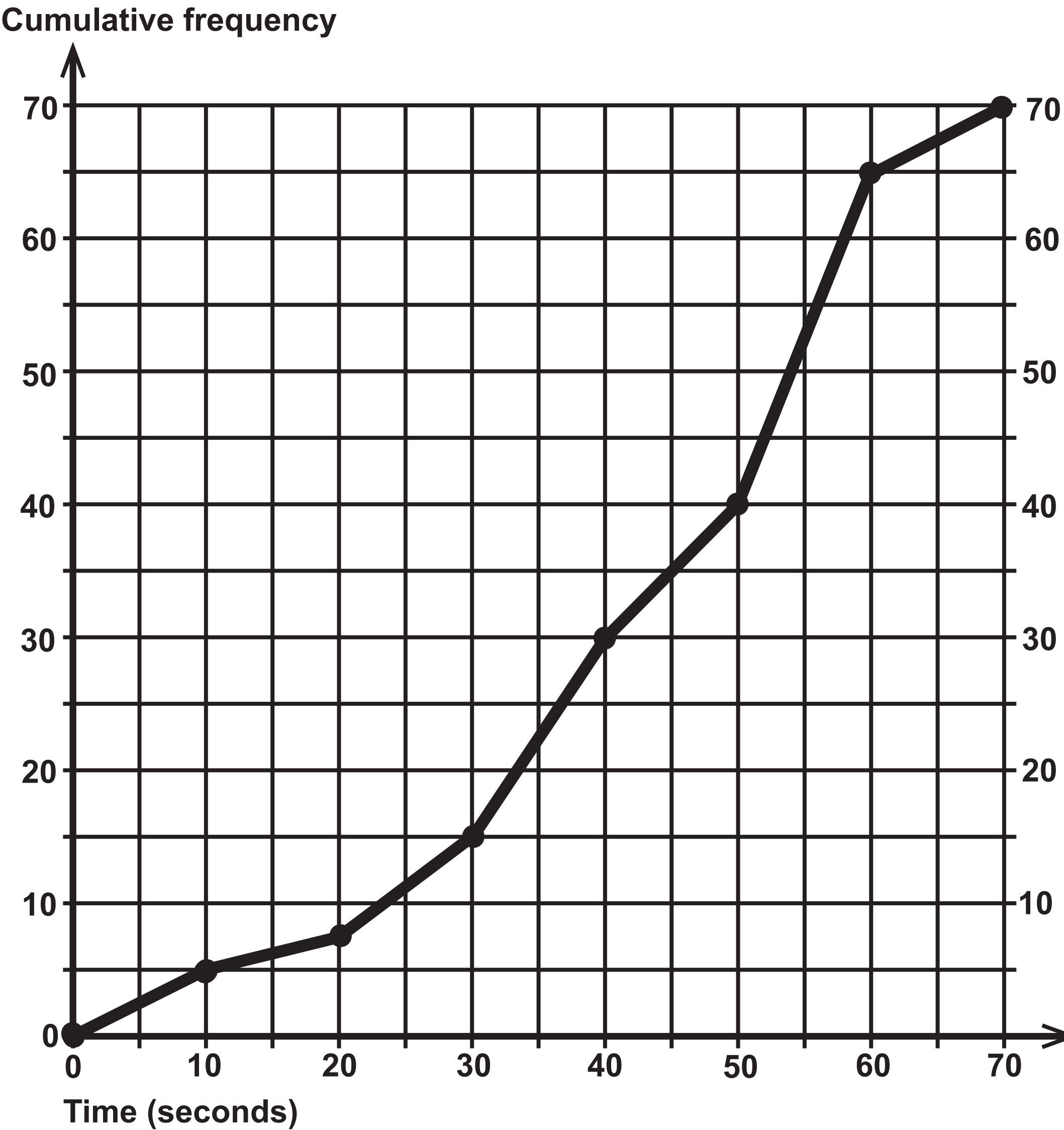


D4

Question 9 (b)

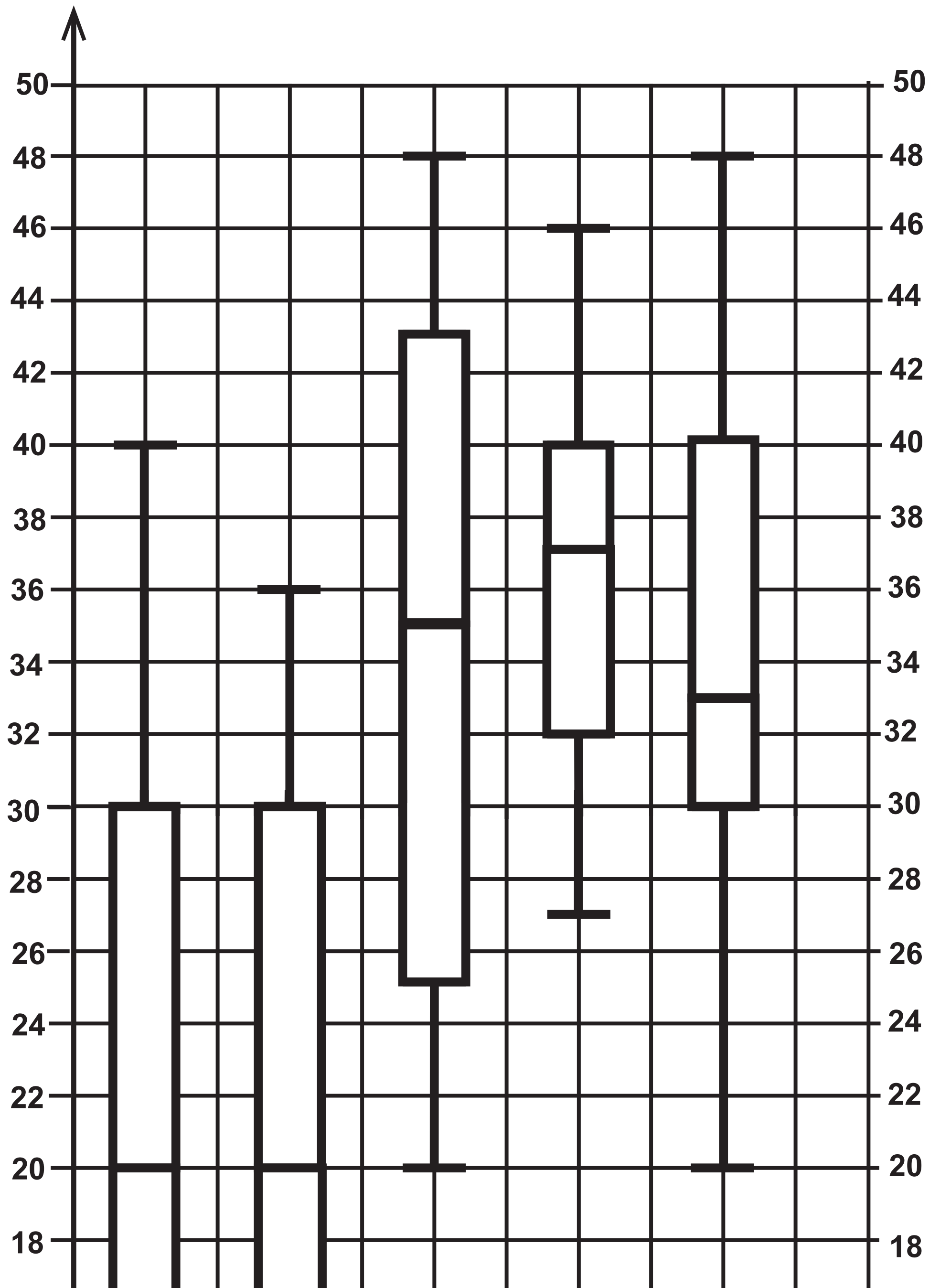


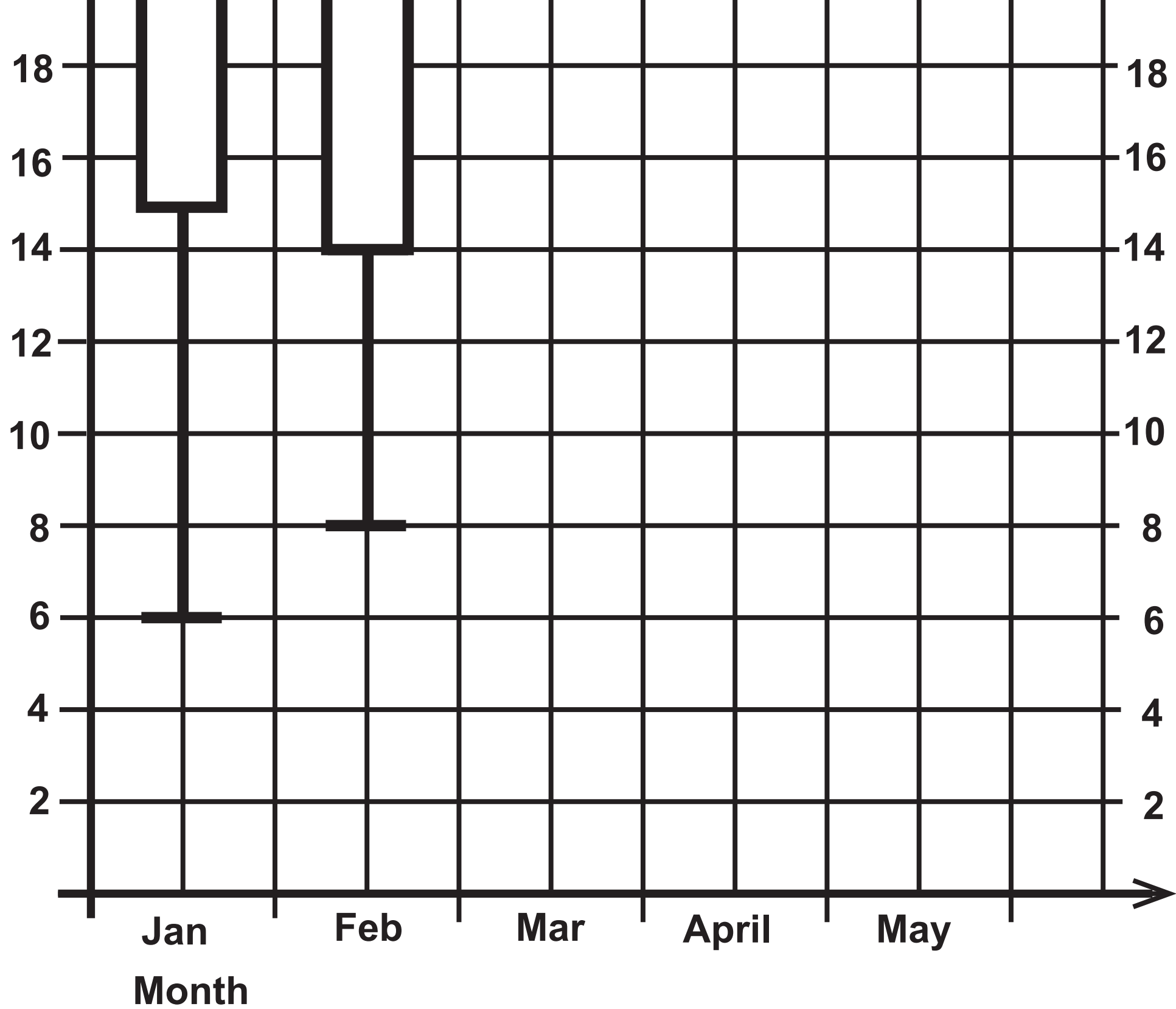
Question 10



Question 11

Flow of water (m^3/s)





Question 11 (d)

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**GCSE – NEW
MATHEMATICS**



and

NUMERACY

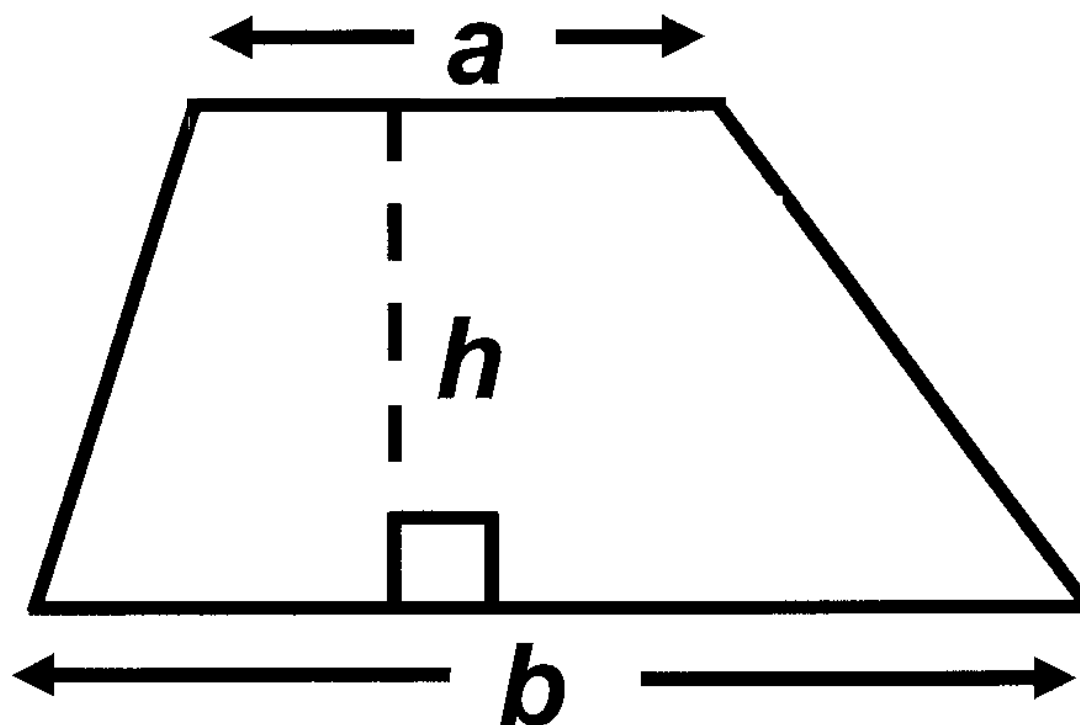
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

**You must not write on these formula
pages.**

**Anything you write on these formula
pages will gain NO credit.**

Formula List – Intermediate Tier

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



Volume of prism =
area of cross – section $\times$ length

