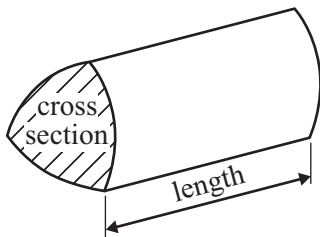


GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

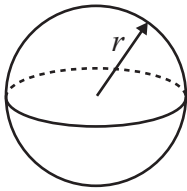
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



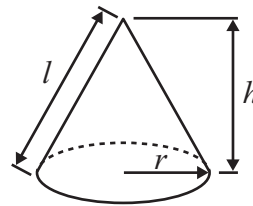
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

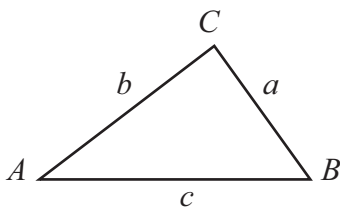


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2} ab \sin C$

Answer ALL EIGHTEEN questions. Write your answers in the spaces provided. You must write down all stages in your working. You must NOT use a calculator.

1. Simplify $6x + 9y + 2x - 3y$

.....

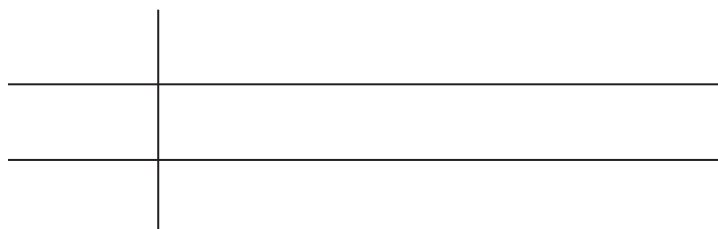
(Total 2 marks)

Q1

2. Here are the weights, in grams, of 16 eggs.

47	45	50	53	43	61	53	62
58	56	57	47	55	62	58	58

Draw an ordered stem and leaf diagram to show this information. You must include a key.



Key:

(Total 3 marks)

Q2

3.

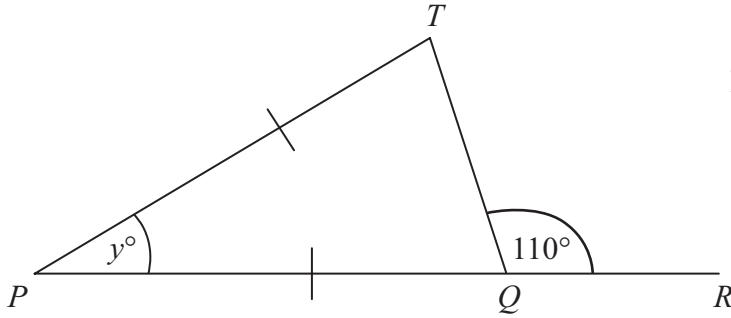


Diagram **NOT** accurately drawn

PQR is a straight line.
 $PT = PQ$.

(i) Work out the value of y .

.....

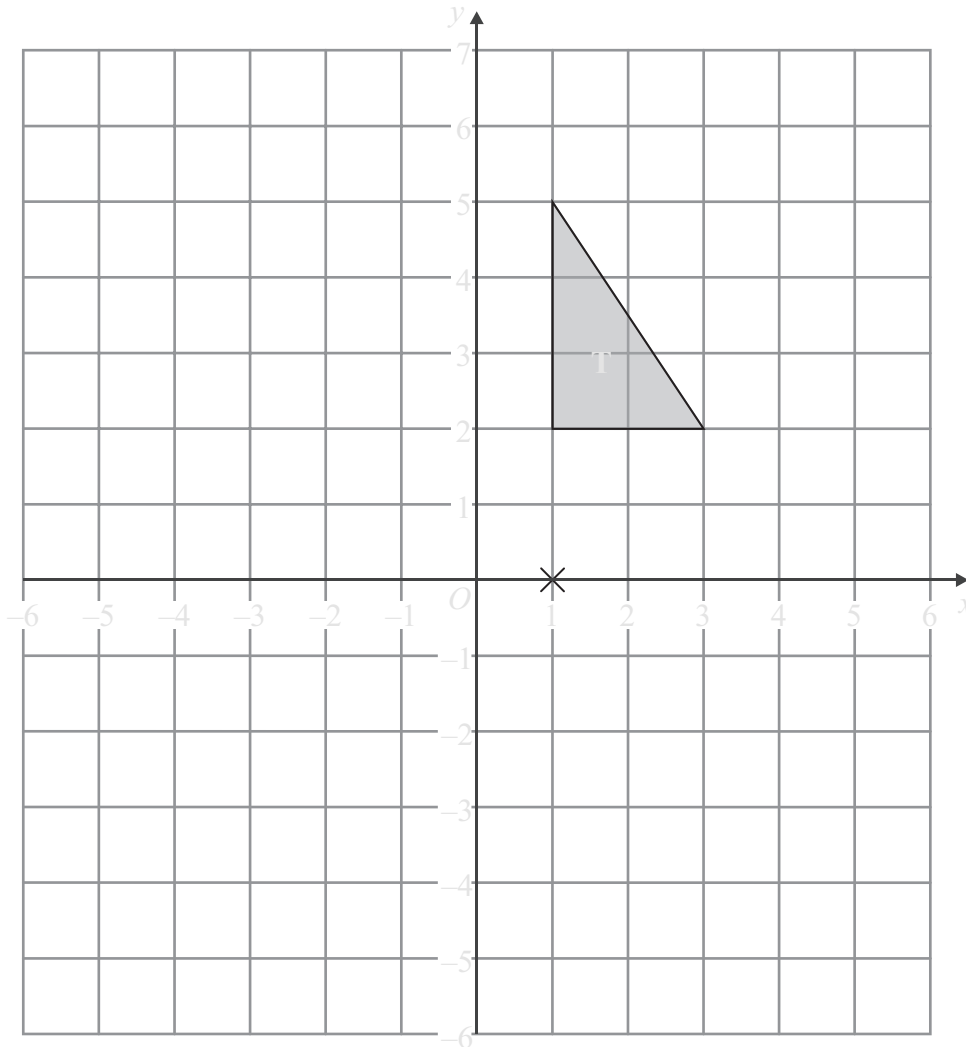
(ii) Give reasons for your answer.

.....
.....
.....

(Total 4 marks)

Q3

4.



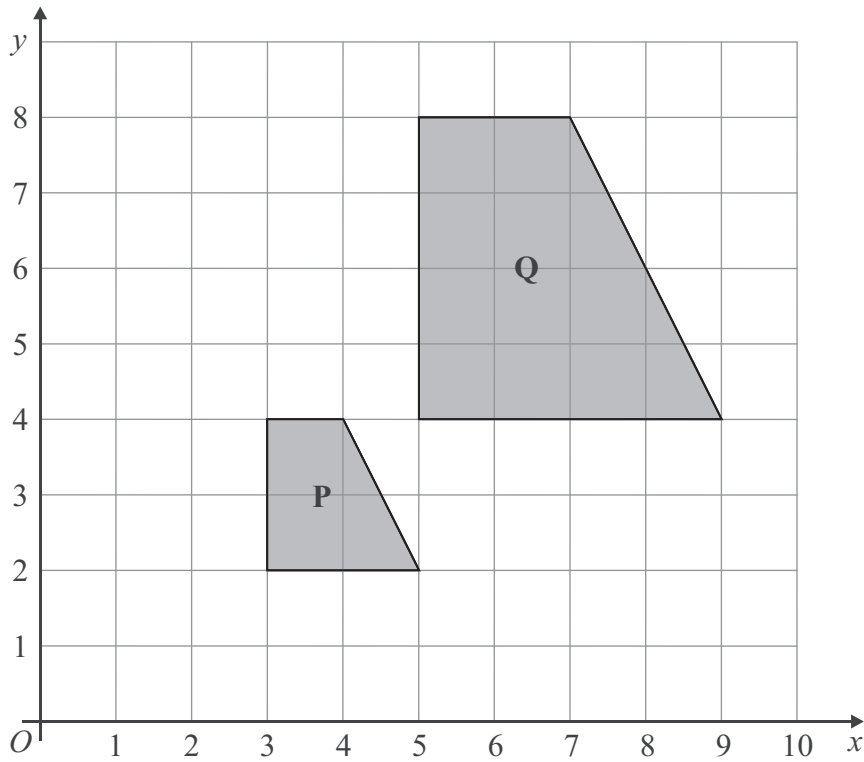
Triangle **T** has been drawn on the grid.

Rotate triangle **T** 180° about the point (1, 0).
Label the new triangle **A**.

(Total 2 marks)

Q5

5.



Describe fully the single transformation which maps shape **P** onto shape **Q**.

.....
.....

(Total 3 marks)

Q6

6. Anna and Bill share £40 in the ratio 2 : 3
Work out how much each person gets.

Anna £.....
Bill £.....

(Total 3 marks)

Q7

7.

Sasha carried out a survey of 60 students.
She asked them how many CDs they each have.

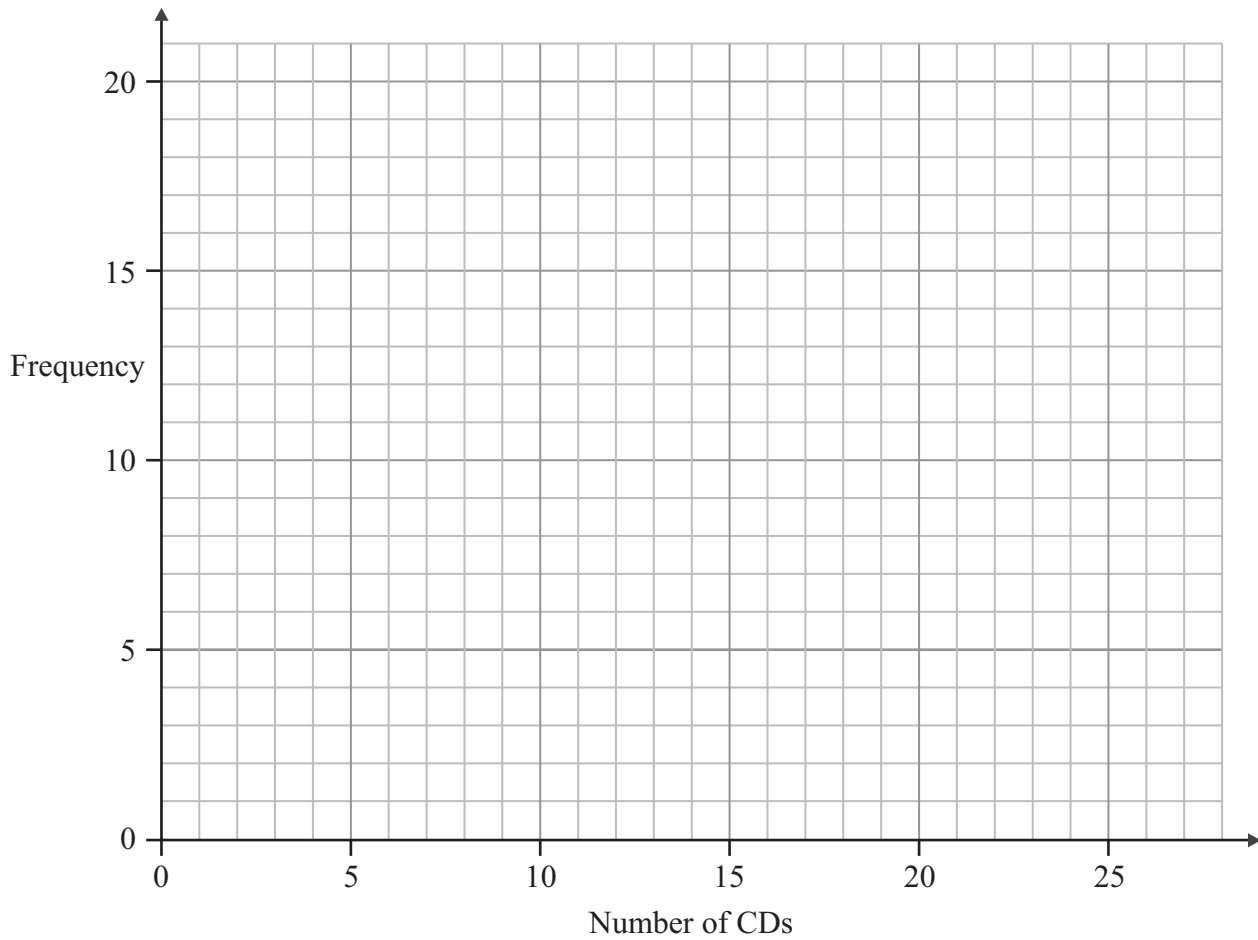
This table shows information about the numbers of CDs these students have.

Number of CDs	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24
Frequency	8	11	9	14	18

(a) Write down the class interval containing the median.

.....
(1)

(b) On the grid, draw a frequency polygon to show the information given in the table.



(2)

(Total 3 marks)

Q8

8.

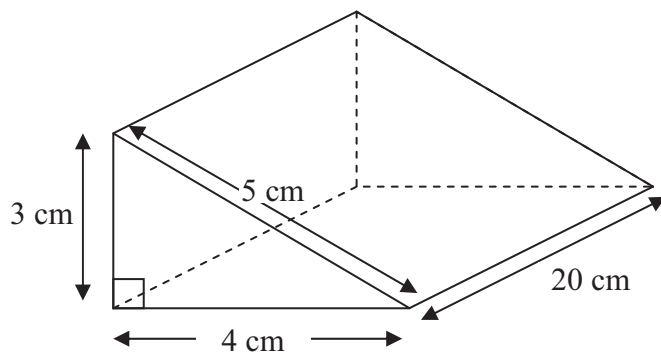


Diagram **NOT** accurately drawn

Work out the volume of the triangular prism.

..... cm³

(Total 2 marks)

Q9

9.

Work out 4.52×36

.....

(Total 3 marks)

Q10

10.

There are 300 people in the cinema.

$\frac{1}{6}$ of the 300 people are boys.

$\frac{3}{10}$ of the 300 people are girls.

The rest of the people are adults.

Work out how many people are adults.

.....

(Total 4 marks)

Q11

11.

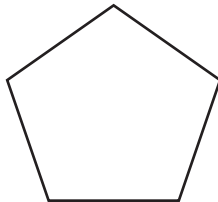


Diagram **NOT**
accurately drawn

Work out the size of an exterior angle of a regular pentagon.

..... °

(Total 2 marks)

Q12

12.

Anil wants to find out how many DVDs people buy.

He uses this question on a questionnaire.

How many DVDs do you buy?

1 – 5

5 – 10

10 – 15

15 – 20

Write down **two** different things wrong with this question.

1

.....

2

.....

(Total 2 marks)

Q13

13.

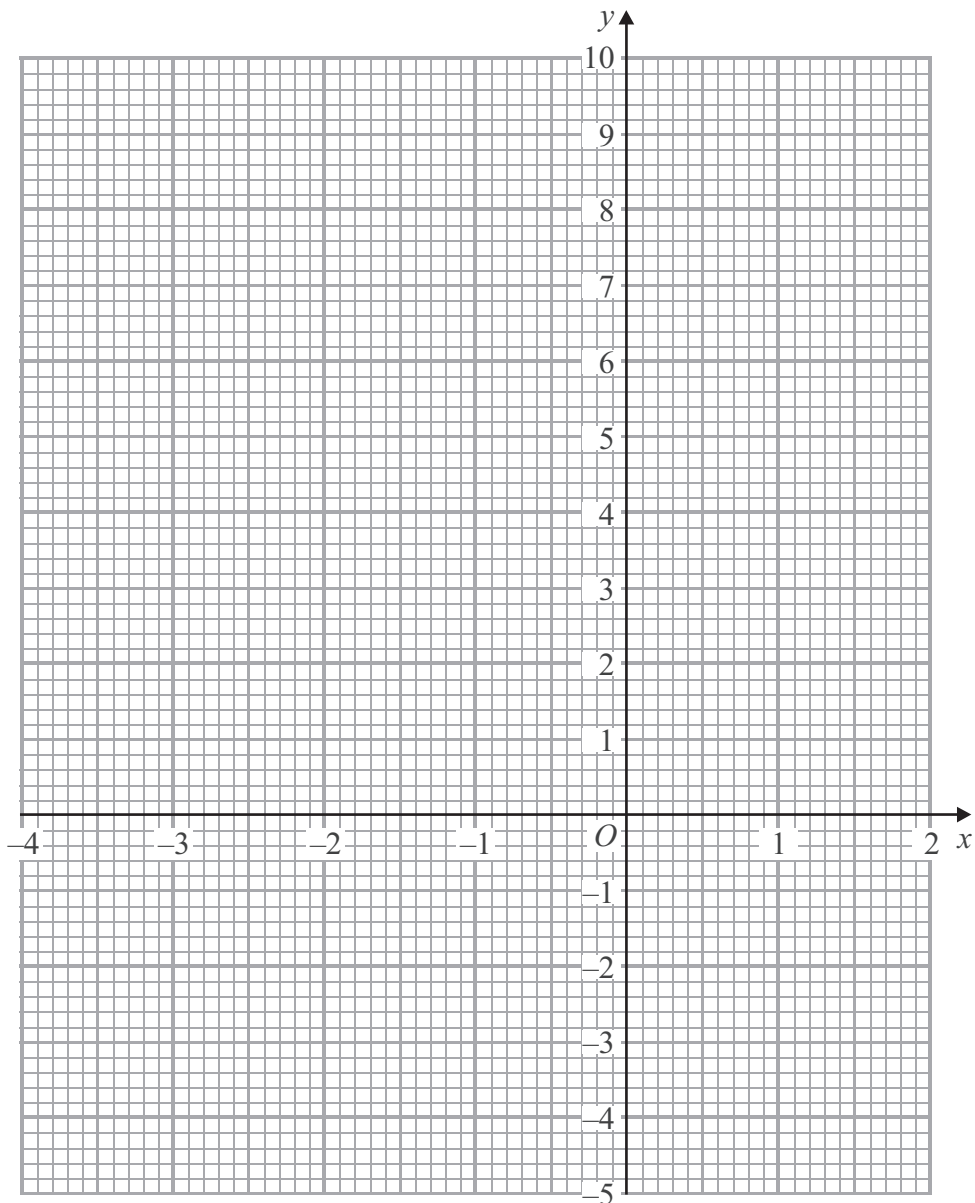
(a) Complete the table of values for $y = x^2 + x - 3$

x	-4	-3	-2	-1	0	1	2
y	9		-1	-3			3

(2)

(b) On the grid below, draw the graph of $y = x^2 + x - 3$ for values of x from -4 to 2

(2)



Leave
blank

(c) Use your graph to find estimates for the solutions of $x^2 + x - 3 = 0$

$x = \dots\dots\dots$

$x = \dots\dots\dots$

(1)

Q14

(Total 5 marks)

14. Express 180 as a product of its prime factors.

Q15

.....
(Total 3 marks)

15.

Work out $3\frac{1}{4} \times 2\frac{2}{3}$

Give your answer in its simplest form.

Q16

.....
(Total 3 marks)

16.

(a) Factorise $3x + 12$

.....
(1)

(b) Solve $4(2x - 3) = 5x + 7$

$x =$
(3)

(c) Expand and simplify $(y + 4)(y + 5)$

.....
(2)

(d) Factorise fully $8x^2 + 12xy$

.....
(2)

(Total 8 marks)

Q17

17. . Solve the simultaneous equations

$$3x + 2y = 8$$
$$2x + 5y = -2$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total 4 marks)

Q21

18.

The table gives some information about the delays, in minutes, of 80 flights.

Delay (n minutes)	Frequency
$0 < n \leq 20$	16
$20 < n \leq 30$	26
$30 < n \leq 40$	23
$40 < n \leq 50$	10
$50 < n \leq 60$	5

(a) Write down the modal class interval.

.....
(1)

(b) Complete the cumulative frequency table.

Delay (n minutes)	Cumulative Frequency
$0 < n \leq 20$	
$0 < n \leq 30$	
$0 < n \leq 40$	
$0 < n \leq 50$	
$0 < n \leq 60$	

(1)

(c) On the grid opposite, draw a cumulative frequency graph for your table.

(2)

(d) Use your graph to find an estimate for

(i) the median delay,

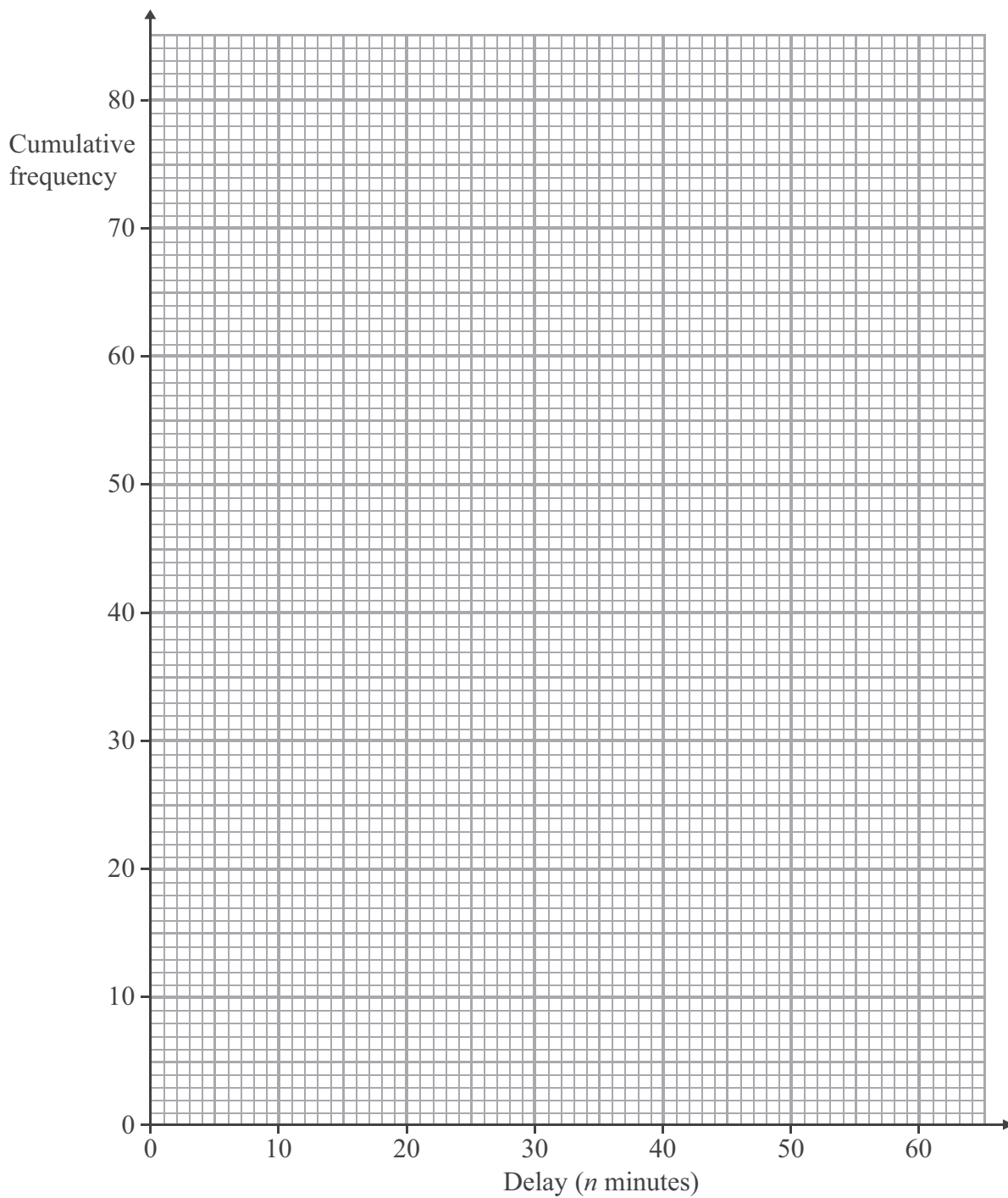
..... minutes

(ii) the interquartile range of the delays.

..... minutes

(3)

Leave blank



Q22

(Total 7 marks)