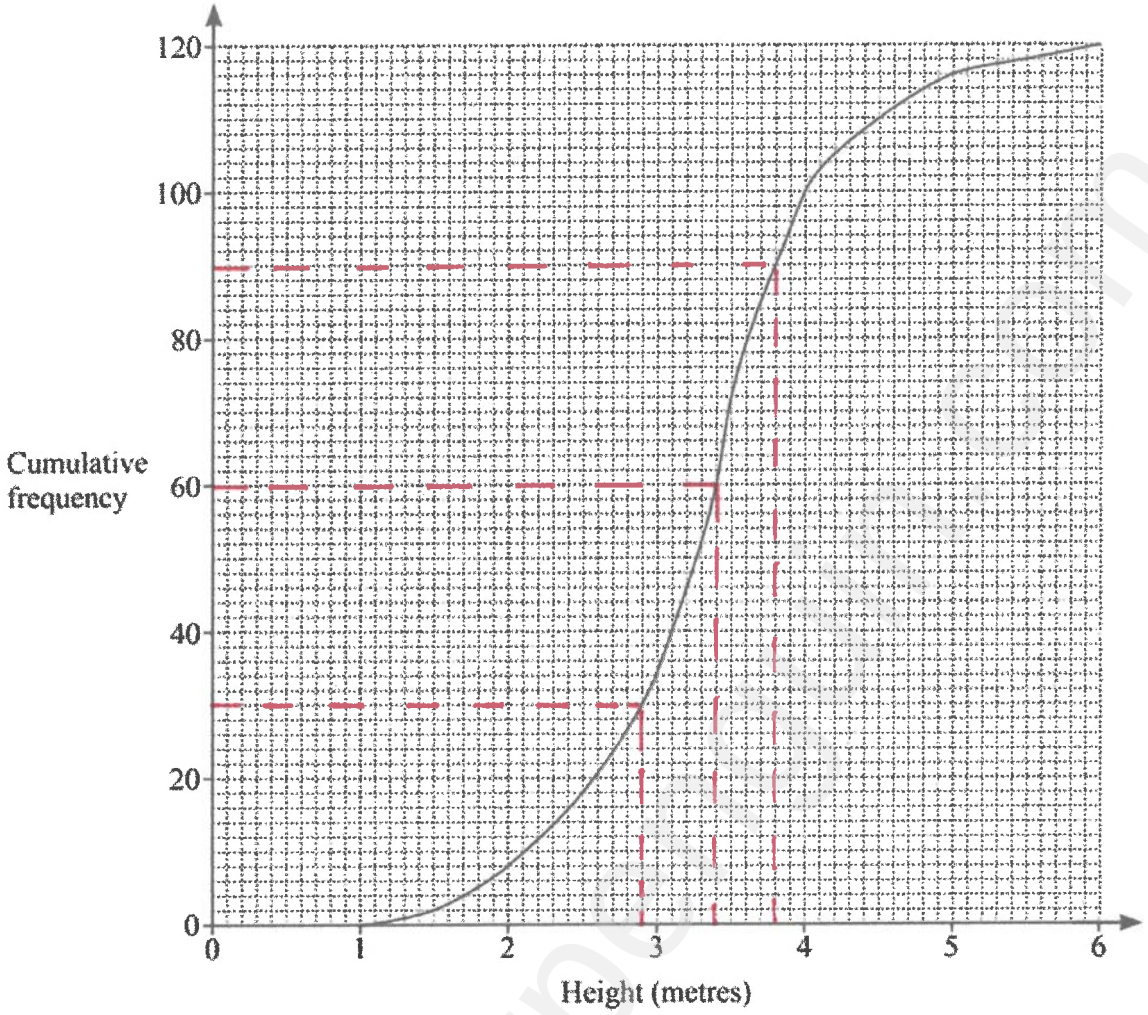
10 The cumulative frequency curve shows the heights of 120 young trees.



Find

(a) the median

$\frac{120}{2} = 60^{th} \rightarrow 3.4$

3.4 m [1]

(b) the interquartile range.

$Q_1 : \frac{120}{4} = 30^{th} \rightarrow 2.9$

$Q_3 : \frac{3(120)}{4} = 90^{th} \rightarrow 3.8$

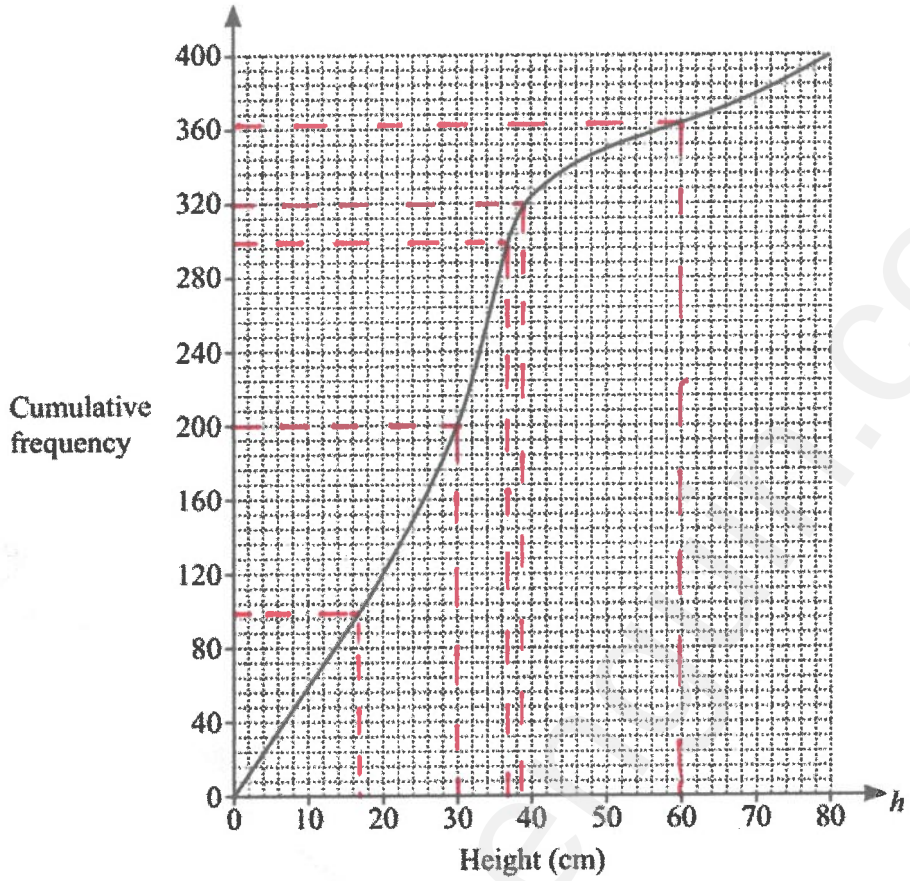
$IQR = 3.8 - 2.9$

$= 0.9$

0.9 m [2]

16 A student measures the height, h cm, of each of 400 plants.

(a) The cumulative frequency diagram shows the results.



Use the diagram to find an estimate for

(i) the median $\frac{400}{2} = 200^{th} \rightarrow 30$

30 cm [1]

(ii) the interquartile range

$100^{th} \rightarrow 17$

$300^{th} \rightarrow 37$

$IQR = 37 - 17$

$= 20$

20 cm [2]

(iii) the 80th percentile

$0.8 \times 400 = 320^{th} \rightarrow 39$

39 cm [2]

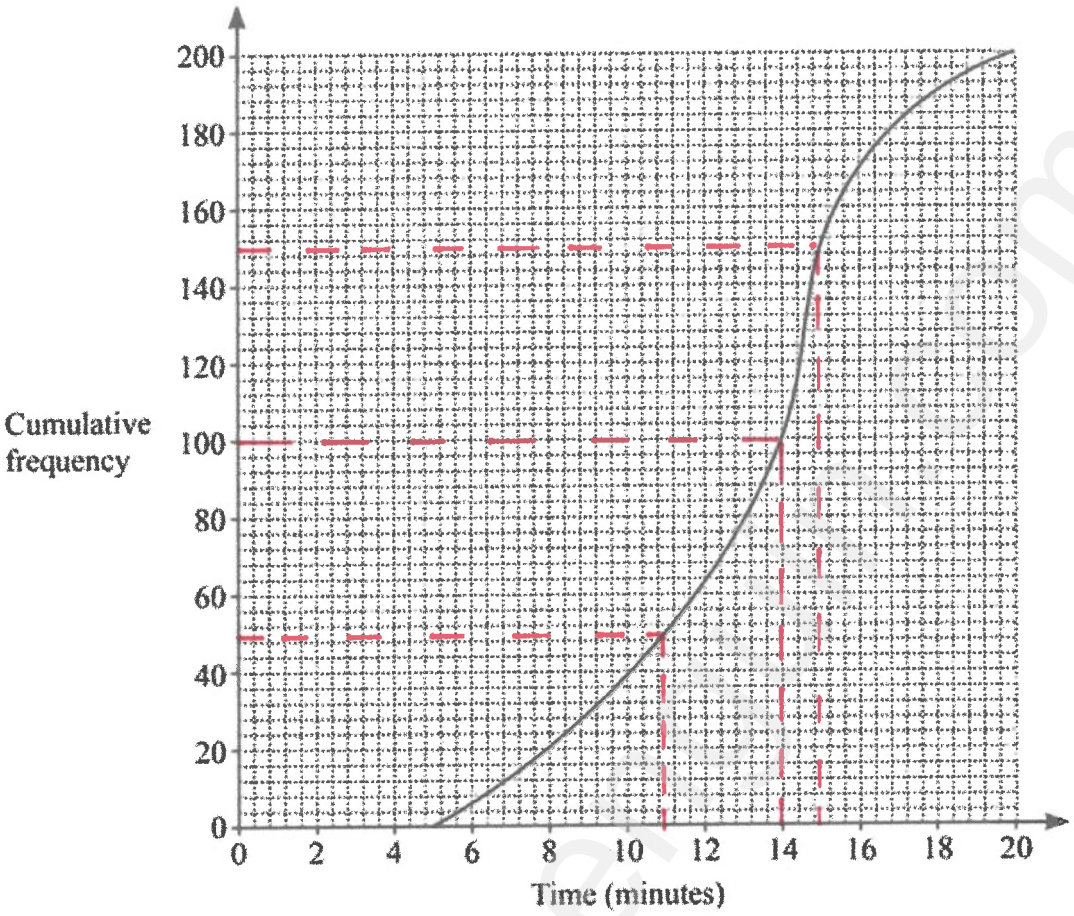
(iv) the number of plants with a height greater than 60 cm.

60cm → 364

400 - 364 = 36

36 [2]

(b) The cumulative frequency diagram shows information about the time taken by each of 200 students to solve a problem.



Use the diagram to find an estimate of

(i) the median, $\frac{200}{2} = 100^{th} \rightarrow 14$

14 min [1]

(ii) the interquartile range.

Q_1: $50^{th} \rightarrow 11$

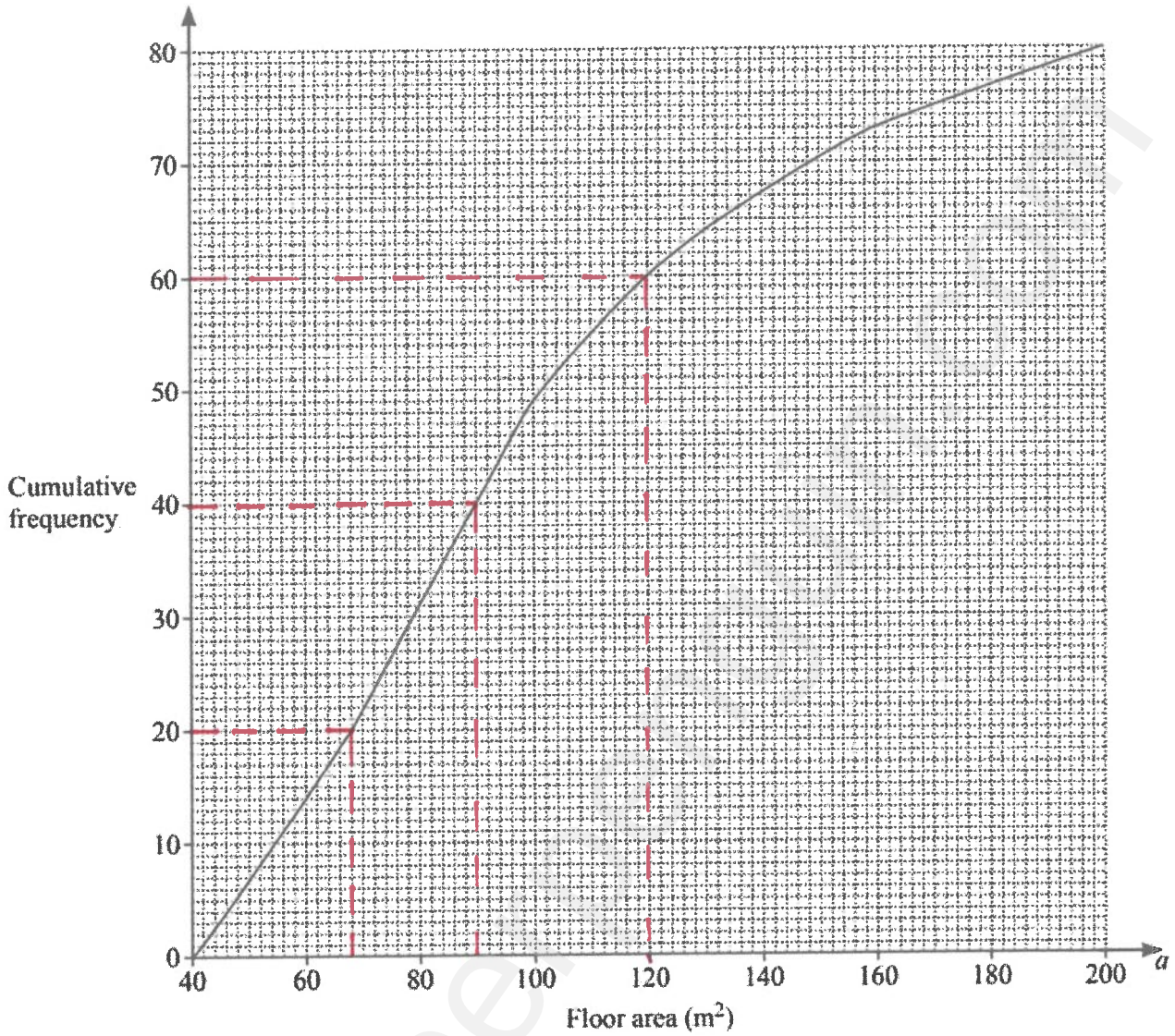
Q_3: $150^{th} \rightarrow 15$

$IQR = 15 - 11$

$= 4$

4 min [2]

2 (a) The cumulative frequency diagram shows information about the floor area, $a\,m^2$, of each of 80 houses.



Use the diagram to find an estimate of

(i) the median, $\frac{80}{2} = 40^{th} \rightarrow 90$

90 ..... m^2 [1]

(ii) the lower quartile, $20^{th} \rightarrow 68$

68 ..... m^2 [1]

(iii) the interquartile range, $60^{th} \rightarrow 120$ IQR: 120 - 68 = 52

52 ..... m^2 [1]

(iv) the number of houses with a floor area greater than $120\,m^2$.

$120 \rightarrow 60$

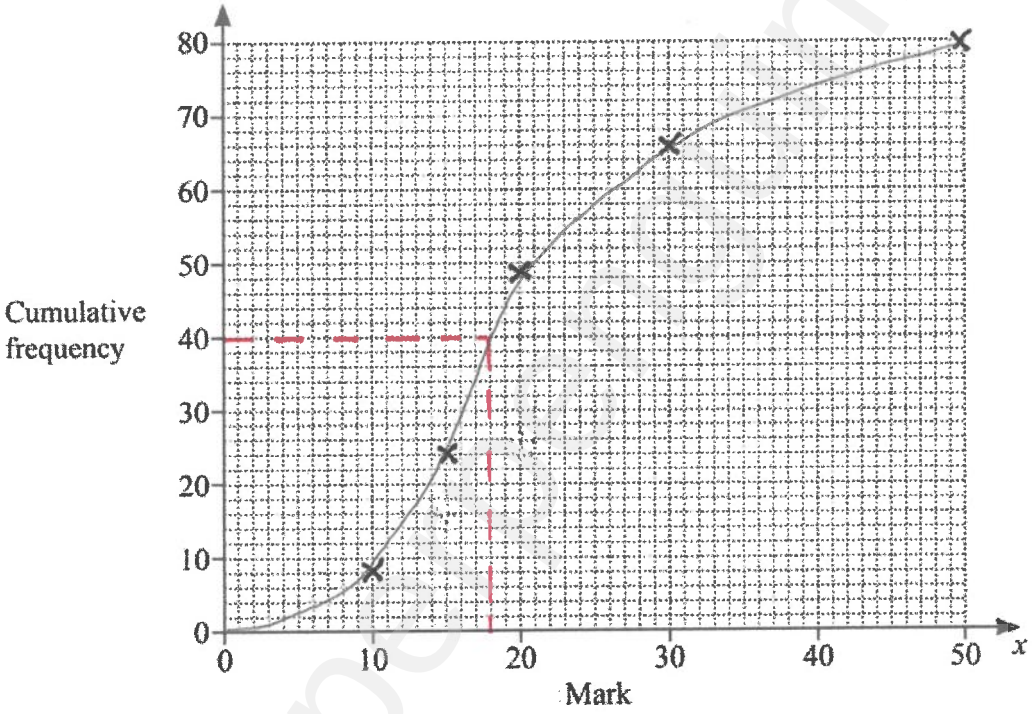
$80 - 60 = 20$

20 ..... [2]

12 The table shows the marks of 80 students in an examination.

Mark (x)	Frequency	c.f.
$0 < x \leqslant 10$	8	8
$10 < x \leqslant 15$	16	24
$15 < x \leqslant 20$	25	49
$20 < x \leqslant 30$	17	66
$30 < x \leqslant 50$	14	80

(a) On the grid, draw a cumulative frequency curve to show this information.



[4]

(b) Use your graph to estimate the median mark of the students.

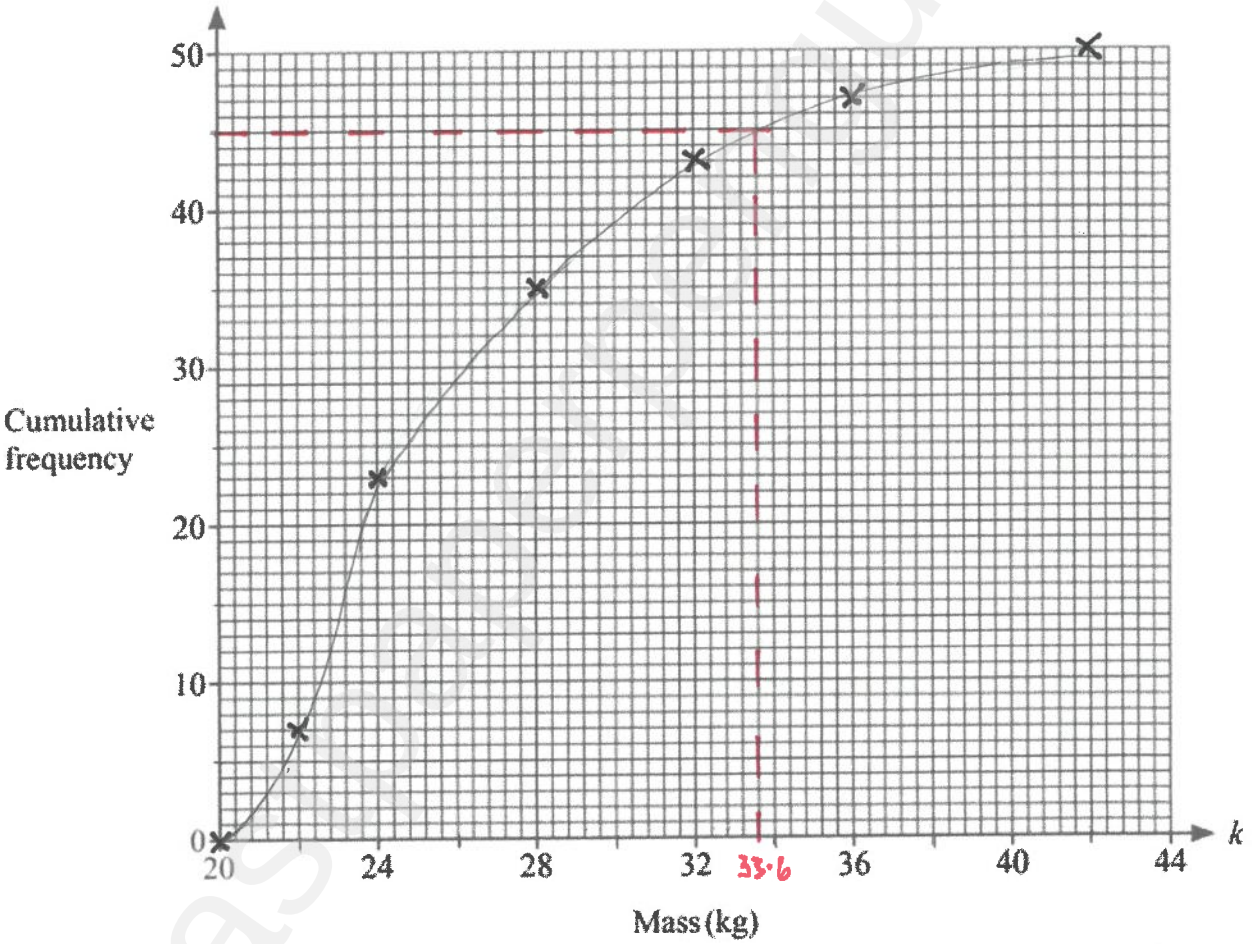
$\frac{80}{2} = 40^{th} \rightarrow 18$

..... 18 ..... [1]

13 The table shows information about the mass of each of 50 children.

Mass (k kg)	Cumulative Frequency
$k \leqslant 20$	0
$k \leqslant 22$	7
$k \leqslant 24$	23
$k \leqslant 28$	35
$k \leqslant 32$	43
$k \leqslant 36$	47
$k \leqslant 42$	50

(a) Draw a cumulative frequency diagram to show this information.



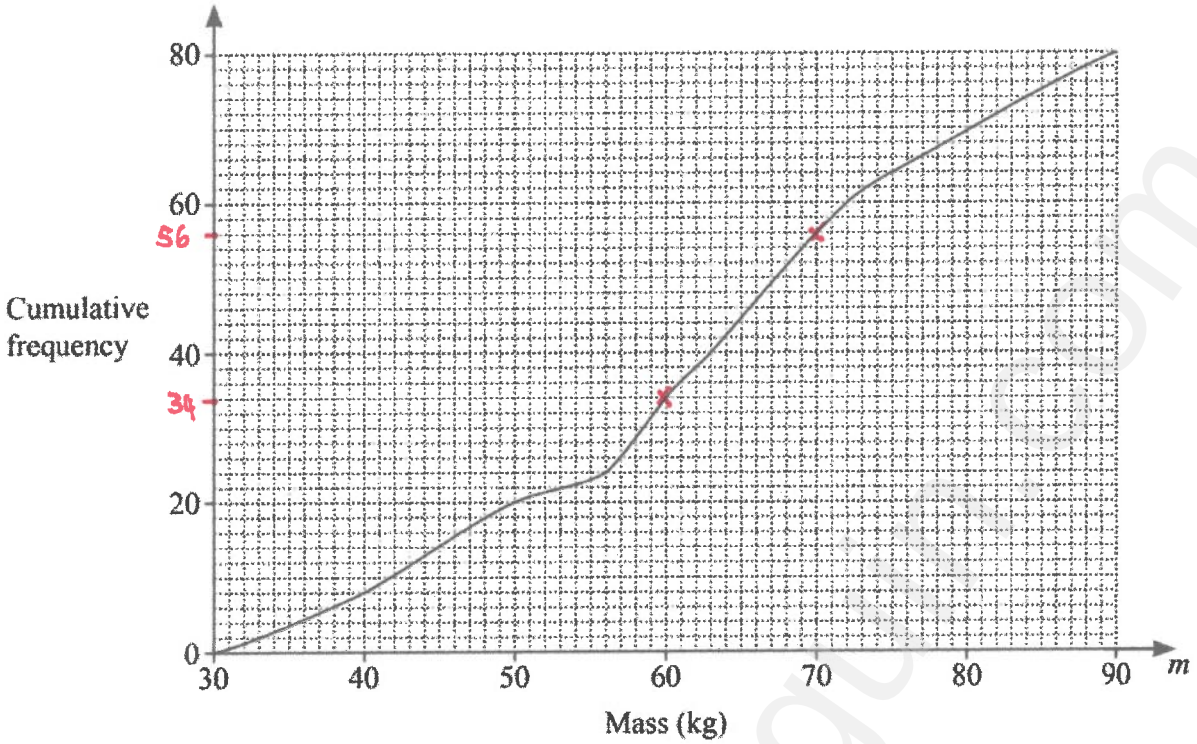
[3]

(b) Use your graph to find an estimate of the 90th percentile.

$0.9 \times 50 = 45^{th} \rightarrow 33.6$

33·6 [1]

3 The cumulative frequency diagram shows information about the mass, m kg, of each of 80 boys.



(c) (i) Use the cumulative frequency diagram to complete this frequency table.

Mass (m kg)	$30 < m \leqslant 40$	$40 < m \leqslant 50$	$50 < m \leqslant 60$	$60 < m \leqslant 70$	$70 < m \leqslant 80$	$80 < m \leqslant 90$
Frequency	8	12	34 − 20 = 14	56 − 34 = 22	14	10
c.f.	8	20	34	56	70	80

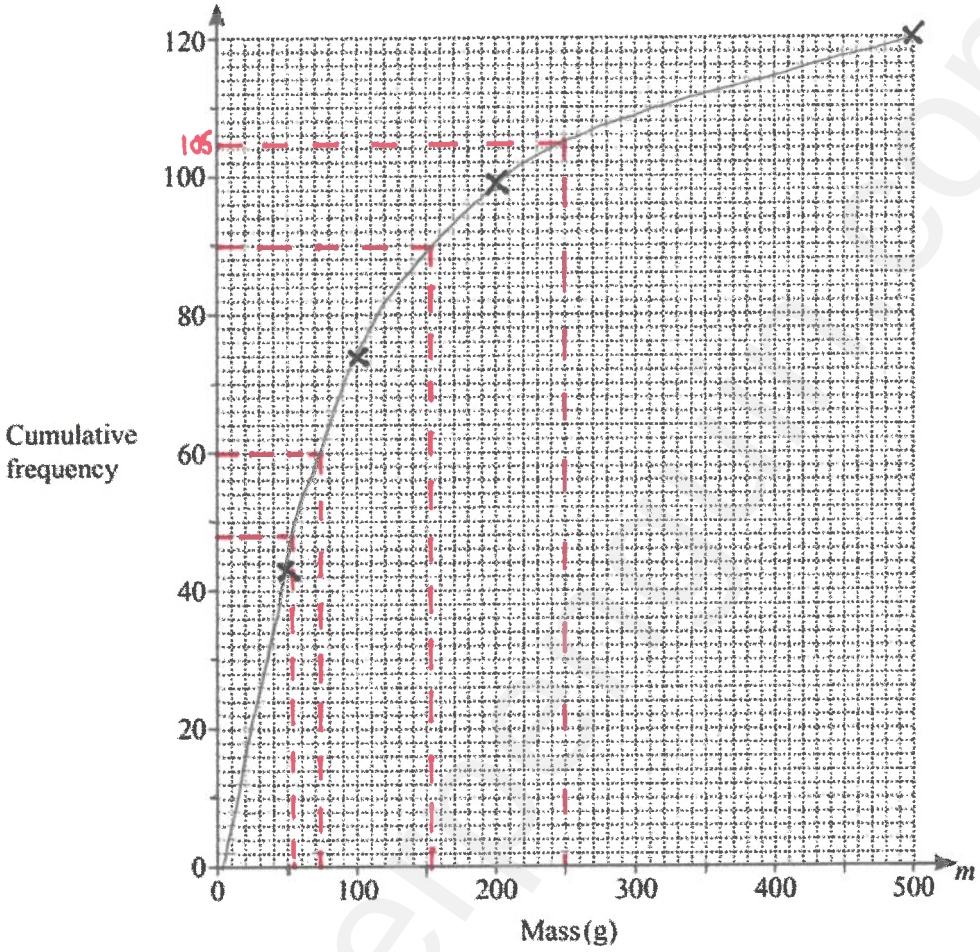
[1]

from graph

5 The table shows information about the mass, m grams, of each of 120 letters.

Mass (m grams)	$0 < m \leqslant 50$	$50 < m \leqslant 100$	$100 < m \leqslant 200$	$200 < m \leqslant 500$
Frequency	43	31	25	21
c.f.	43	74	99	120

(d) Draw a cumulative frequency diagram.



[3]

(e) Use the cumulative frequency diagram to find an estimate for

(i) the median,

$\frac{120}{2} = 60^{th} \rightarrow 75g$

75 g [1]

(ii) the upper quartile.

$\frac{3(120)}{4} = 90^{th} \rightarrow 155g$

155 g [1]

(iii) the 40th percentile,

$0.4 \times 120 = 48^{th} \rightarrow 55g$

55 g [2]

(iv) the number of letters with a mass m where $250 < m \leqslant 400$.

$250g \rightarrow 105$ $\quad 120 - 105 = 15$

15 [2]

8 (a) The table shows information about the mass, in kilograms, of each of 50 children.

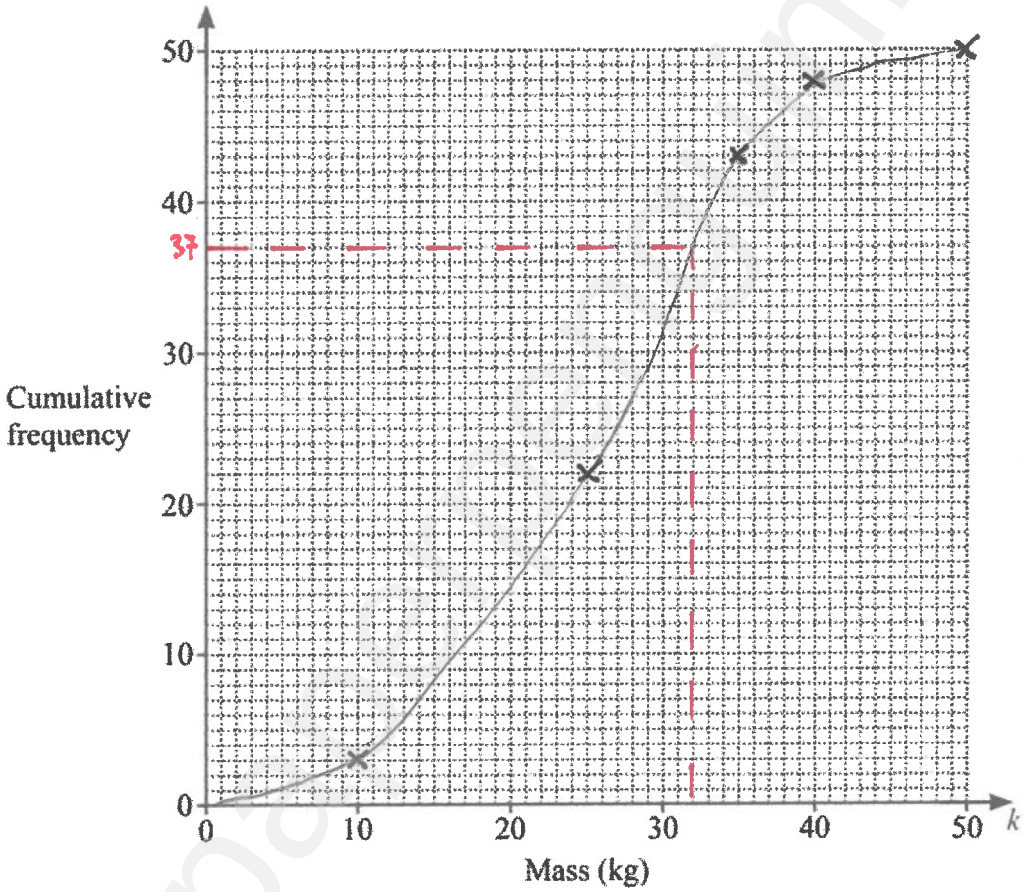
Mass ($k$kg)	$0 < k \leqslant 10$	$10 < k \leqslant 25$	$25 < k \leqslant 35$	$35 < k \leqslant 40$	$40 < k \leqslant 50$
Frequency	3	19	21	5	2

(i) Complete the cumulative frequency table.

Mass ($k$kg)	$k \leqslant 10$	$k \leqslant 25$	$k \leqslant 35$	$k \leqslant 40$	$k \leqslant 50$
Cumulative frequency	3	22	43	48	50

[2]

(ii) On the grid, draw a cumulative frequency diagram to show this information.

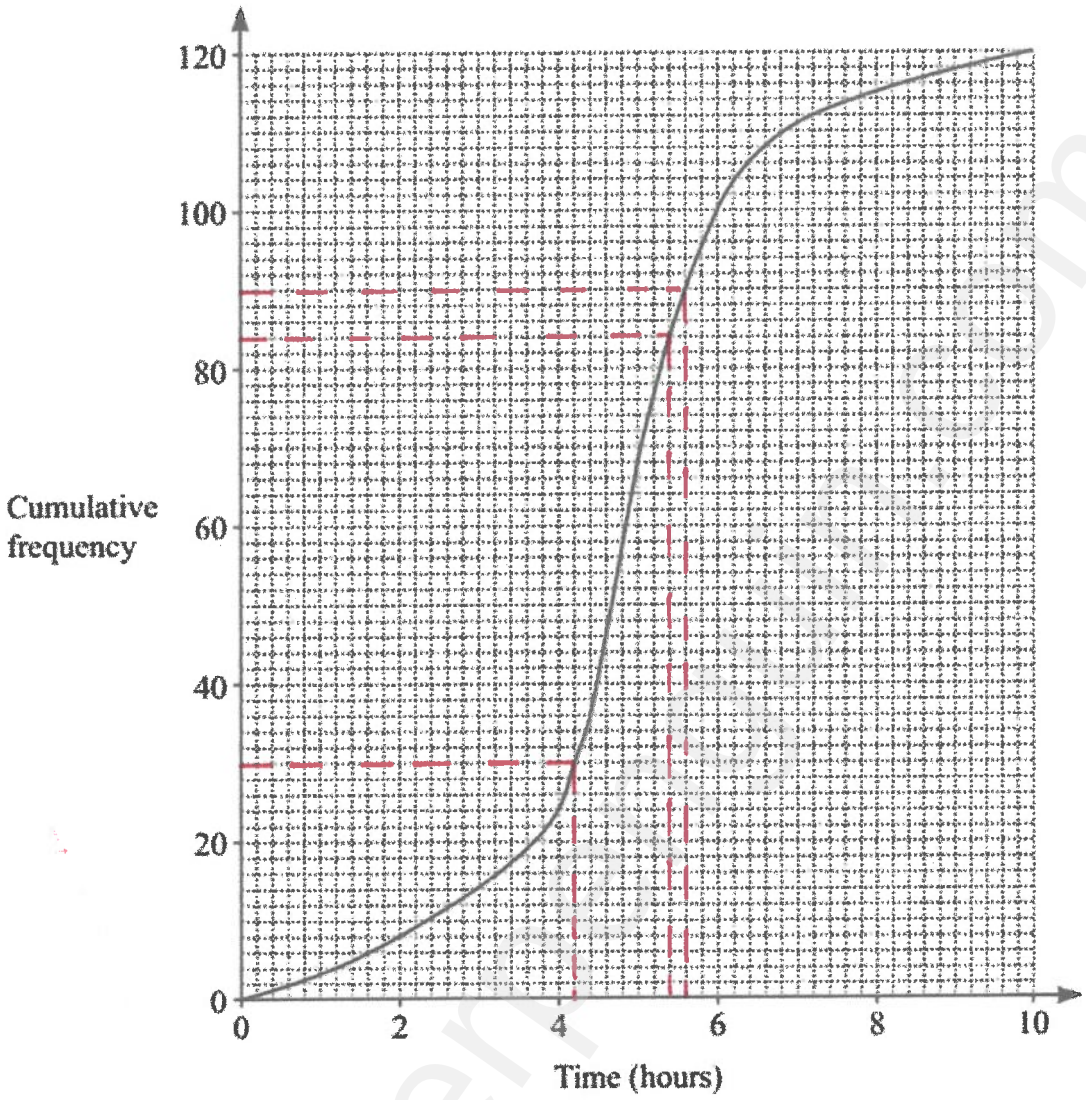


[3]

(iii) Use your diagram to find an estimate of the number of children with a mass of 32 kg or less.

37 ..... [1]

12 The time spent on the internet by each of 120 adults is recorded for one day.
The cumulative frequency diagram shows this information.



(a) Use the cumulative frequency diagram to find an estimate of the interquartile range.

Q_1: $\frac{120}{4} = 30^{th} \rightarrow 4.2$

Q_3: $\frac{3(120)}{4} = 90^{th} \rightarrow 5.6$

IQR: $5.6 - 4.2$

$= 1.4$

1.4 h [2]

(b) 70% of the adults spent less than k hours on the internet.

Use the cumulative frequency diagram to find an estimate of the value of k.

$0.7 \times 120 = 84^{th} \rightarrow 5.4$

$k =$ 5.4 [2]