Cumulative Frequency Diagrams

SCAN ME

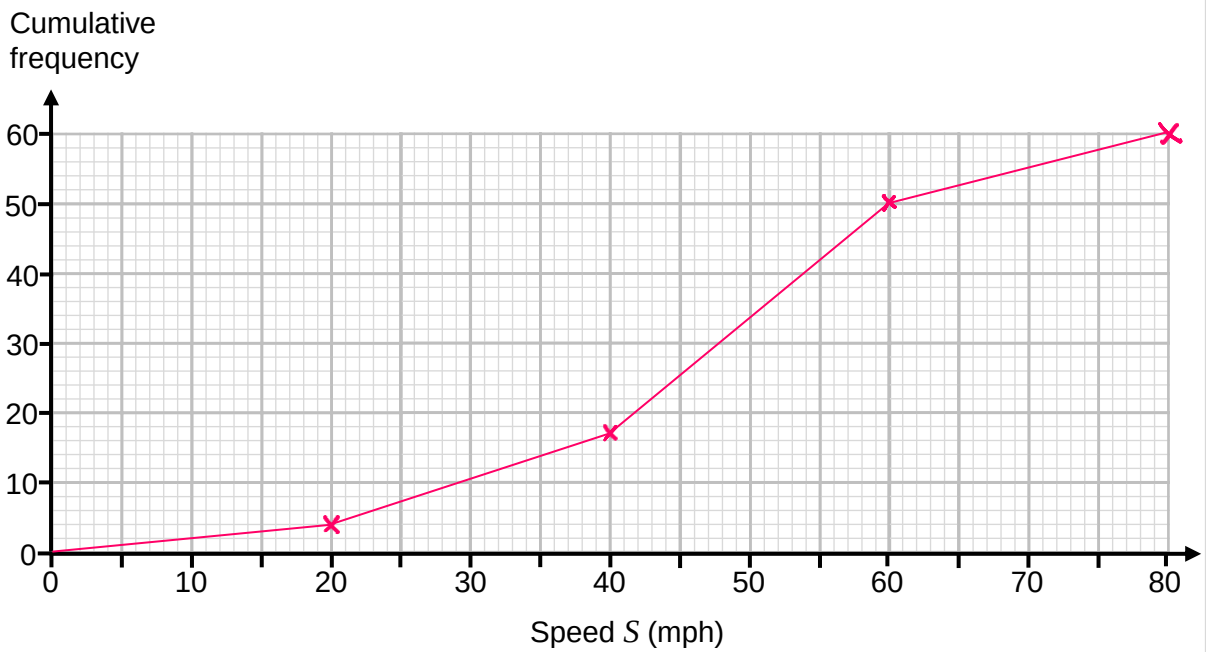
REVISE THIS TOPIC

1 Here is some information about the speeds of 60 cars in miles per hour.

Speed, S	Frequency
$0 < S \leq 20$	4
$20 < S \leq 40$	13
$40 < S \leq 60$	33
$60 < S \leq 80$	10

Speed	C. Frequency
$S \leq 20$	4
$S \leq 40$	17
$S \leq 60$	50
$S \leq 80$	60

Draw a cumulative frequency graph. **[3 marks]**



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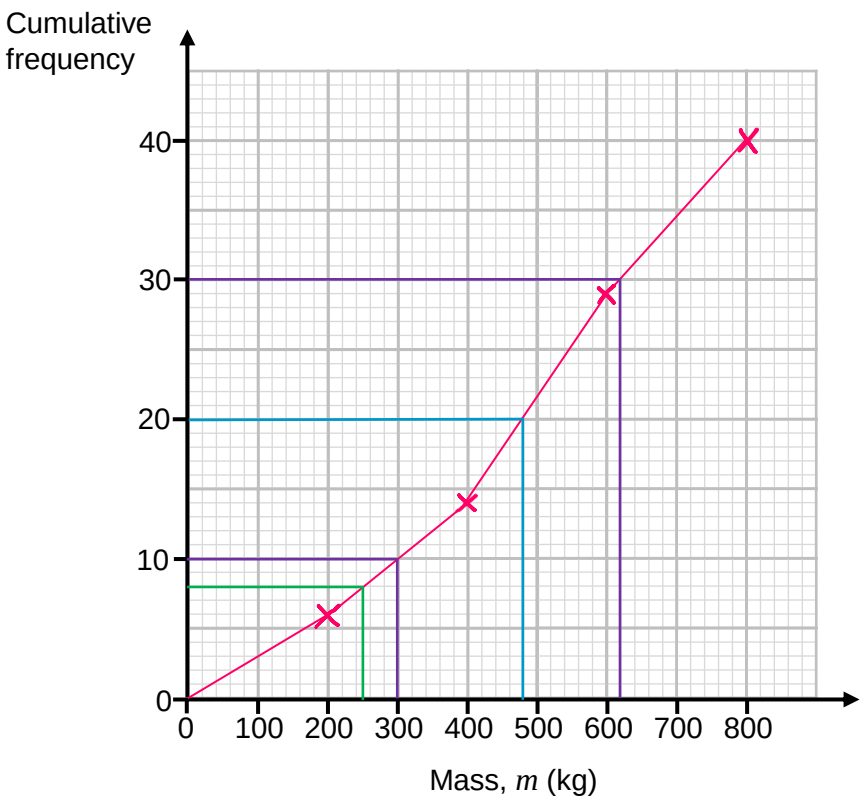
2 Here is some information about the masses, in kilograms, of 40 cows in a field.

Mass, m, (kg)	**Frequency**
$0 < m \leq 200$	6
$200 < m \leq 400$	8
$400 < m \leq 600$	15
$600 < m \leq 800$	11

Mass	C. Frequency
$m \leq 200$	6
$m \leq 400$	14
$m \leq 600$	29
$m \leq 800$	40

2 (a) Draw a cumulative frequency graph. **[3 marks]**



2 (b) Use your graph to estimate the median mass of the 40 cows. **[1 mark]**

Answer 480 kg

2 (c) Use your graph to estimate the interquartile range of masses of the 40 cows. **[2 marks]**

620 − 300

Answer 320 kg

2 (d) Cows that has a mass of less than 250 kg are considered small cows.

Use your graph to find an estimate for the proportion of the cows in the field that are small cows. **[2 marks]**

8 small cows $\frac{8}{40} = \frac{1}{5}$

40 total cows

Answer $\frac{1}{5}$

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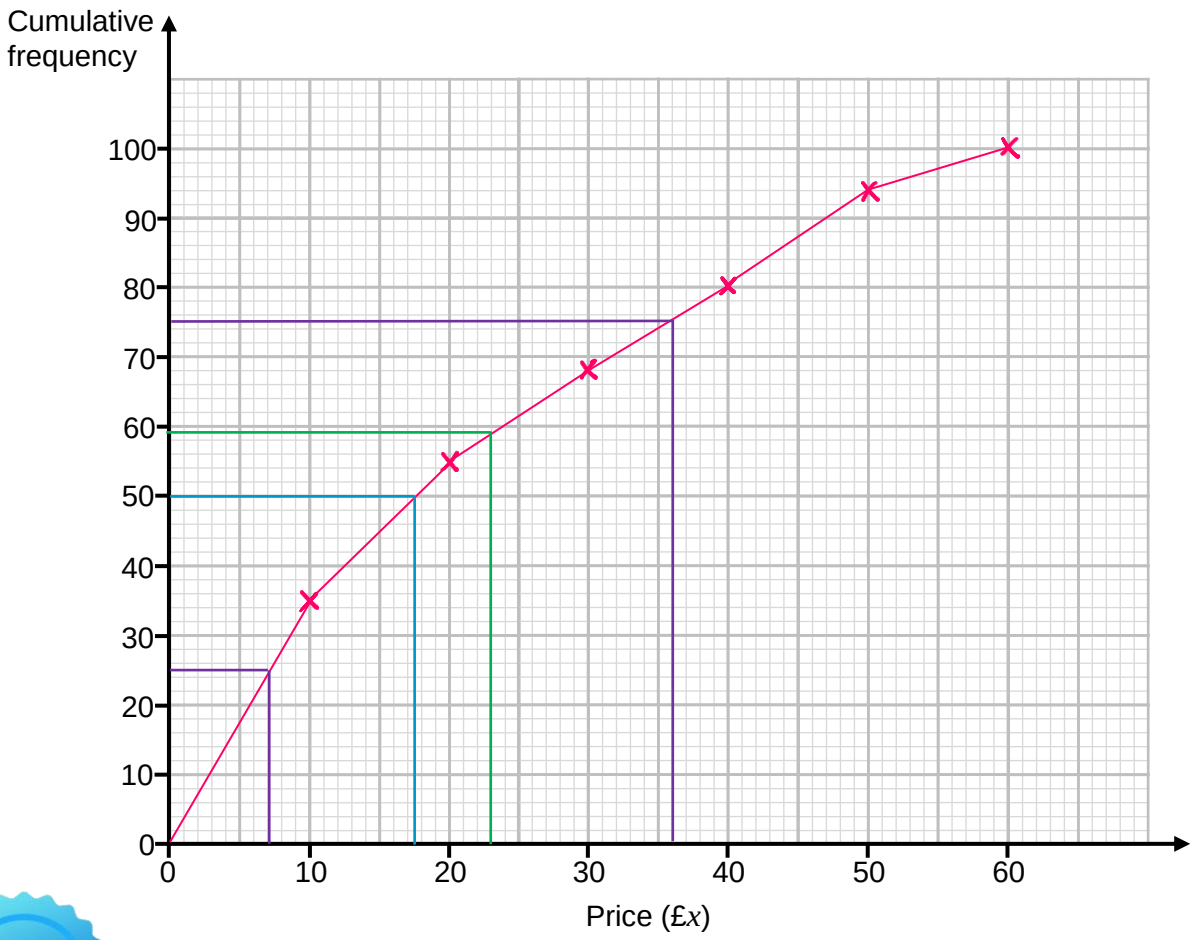
3 Here is some information about the price of 100 items in a shop.

Price (£x)	Frequency
$0 \le x < 10$	35
$10 \le x < 20$	20
$20 \le x < 30$	13
$30 \le x < 40$	12
$40 \le x < 50$	14
$50 \le x < 60$	6

Price	C.Frequency
$x \le 10$	35
$x \le 20$	55
$x \le 30$	68
$x \le 40$	80
$x \le 50$	94
$x \le 60$	100

3 (a) Draw a cumulative frequency graph. **[3 marks]**



3 (b) Use your graph to estimate the median price of the 100 items. **[1 mark]**

Answer £ 17.50

3 (c) Use your graph to estimate the interquartile range of prices of the 100 items. **[2 marks]**

£36.00 − £7.00

Answer £ 29

3 (d) Chris has £23.00
One of the items is selected at random.

Use your graph to estimate the probability that Chris can afford to buy the item. **[2 marks]**

59 items less than £23.00
100 items total

Answer $\frac{59}{100}$

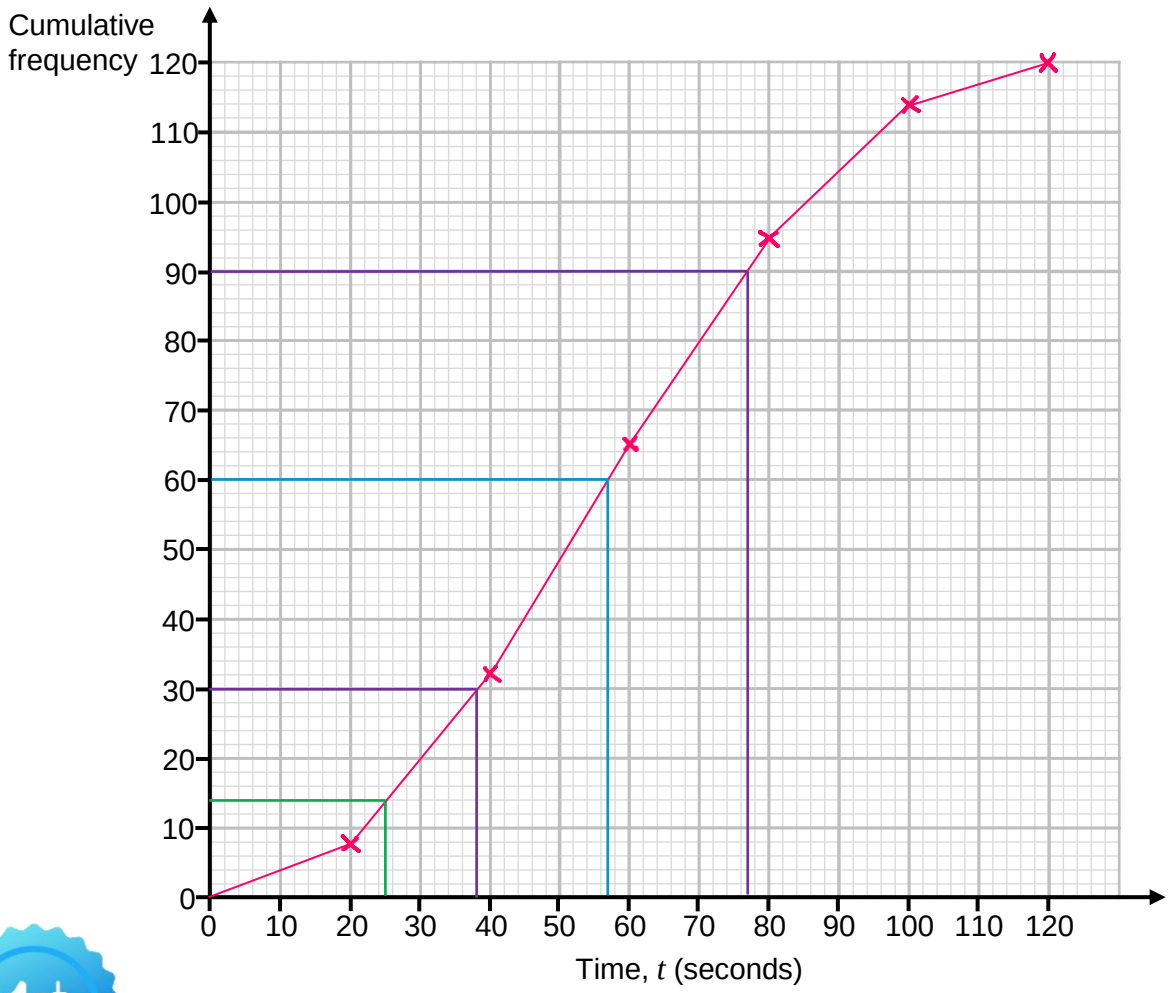
8

4 Here is some information about the times taken for 120 people to solve a maths problem.

Time, t, (seconds)	Frequency
$0 < t \leq 20$	8
$20 < t \leq 40$	24
$40 < t \leq 60$	33
$60 < t \leq 80$	30
$80 < t \leq 100$	19
$100 < t \leq 120$	6

Time	C. frequency
$t \leq 20$	8
$t \leq 40$	32
$t \leq 60$	65
$t \leq 80$	95
$t \leq 100$	114
$t \leq 120$	120

4 (a) Draw a cumulative frequency graph. **[3 marks]**



4 (b) Use your graph to estimate the median time taken by the 120 people. **[1 mark]**

Answer 57 seconds

4 (c) Use your graph to estimate the interquartile range of times taken to solve the maths problem. **[2 marks]**

77 − 38

Answer 39 seconds

4 (d) Everyone who solved the problem in less than 25 seconds wins a prize.

Use your graph to find an estimate for the percentage of people that won a prize. **[2 marks]**

14 people win a prize
120 people total $\frac{14}{120} \times 100$
$= 11.6\%$

Answer 11.6 %

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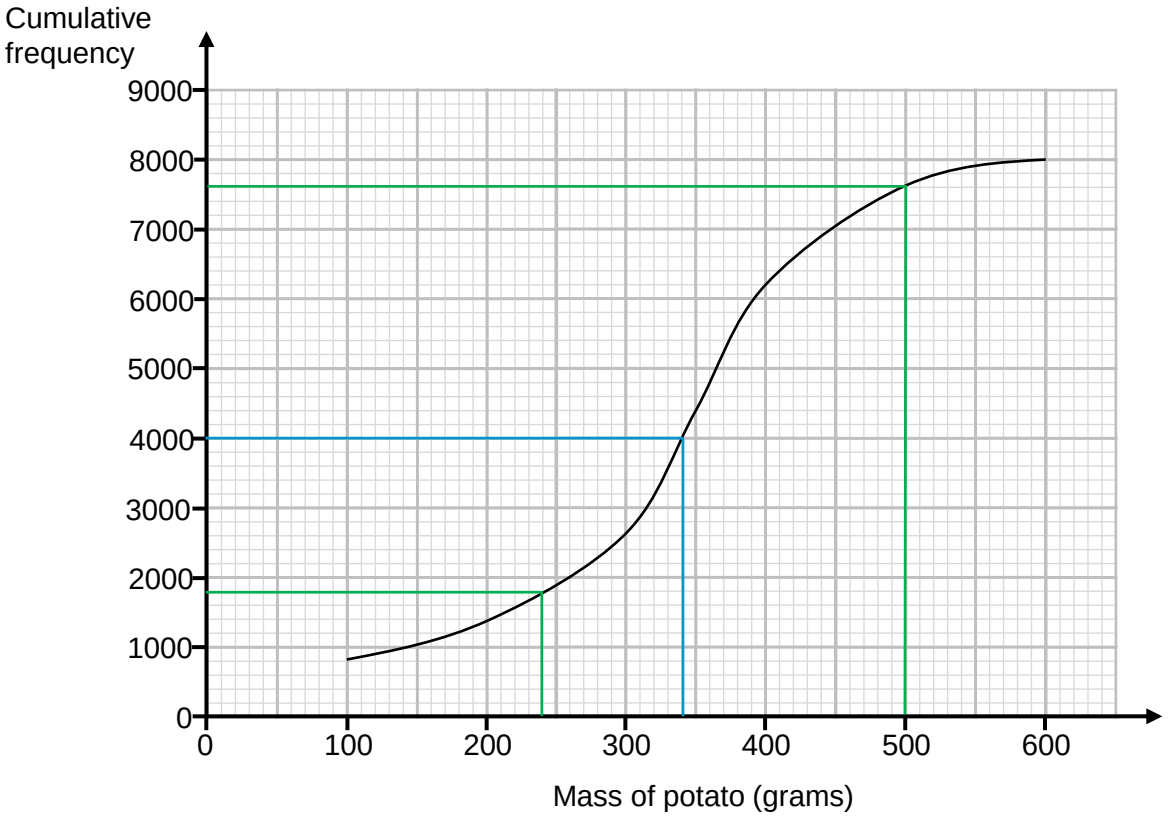
5 The cumulative frequency diagram shows information about the masses, in grams, of the potatoes that a farmer harvests.



5 (a) Use your graph to estimate the median mass of the potatoes. **[1 mark]**

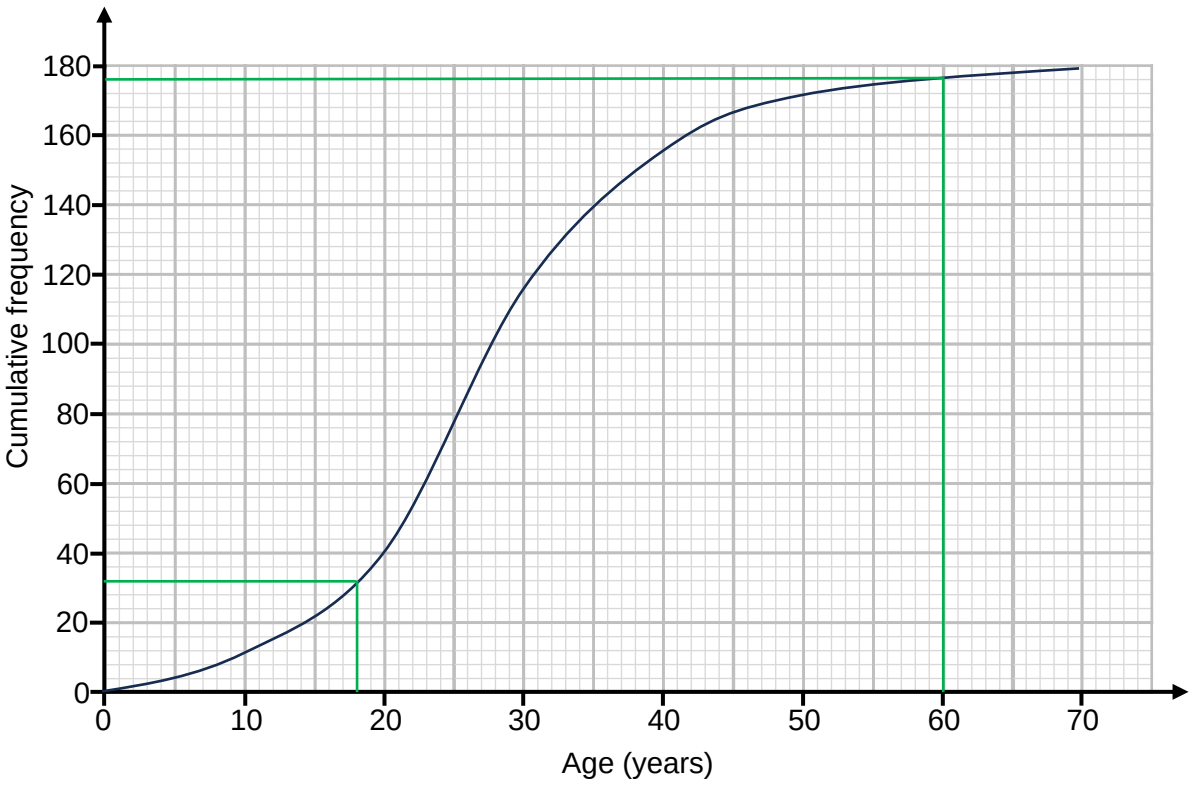
Answer 340 grams

5 (b) The farmer can only sell potatoes that have a mass between 240g and 500g. Use your graph to work out an estimate for the number of potatoes from that harvest that the farmer can sell. **[2 marks]**

7600 − 1800

Answer 5800 potatoes

6 The cumulative frequency diagram shows information about the ages, in years, of 180 people attending a cinema to watch a film.



The prices of different tickets are shown in the table below.

Child (18 years and under)	General Ticket	Senior (60 years and over)
£6.50	£9.50	£7.50

Use the graph to work out an estimate for the total amount of money the cinema receives in ticket sales for the showing of this film.

[4 marks]

32 children

4 seniors

180 − 32 − 4 = 144 general

32 × 6·50 + 4 × 7·50 + 144 × 9·50

Answer £ 1606

7

Turn over ►

7 Peter throws the javelin 48 times and records the distances.
Here is some information about the distances d, in metres of his 48 throws.

Distance, d, (m)	$0 < d \leq 15$	$15 < d \leq 30$	$30 < d \leq 45$	$45 < d \leq 60$
Frequency	a	b	c	d

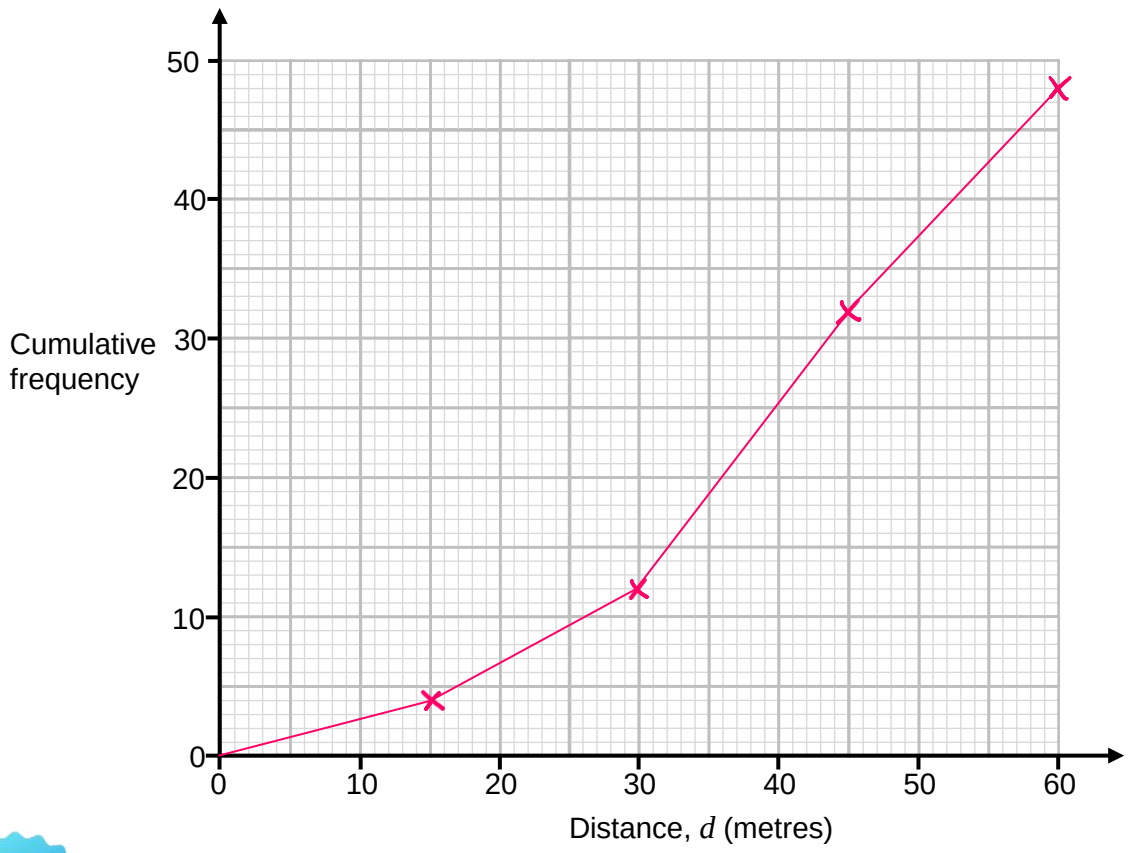
7 (a) $a : b : c : d = 1 : 2 : 5 : 4$

1 : 2 : 5 : 4 | 12 ×4
4 8 20 16 | 48

Complete the cumulative frequency table. **[3 marks]**

Distance, d, (m)	$d \leq 15$	$d \leq 30$	$d \leq 45$	$d \leq 60$
Cumulative Frequency	4	12	32	48

7 (b) Draw a cumulative frequency graph for this information. **[2 marks]**



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