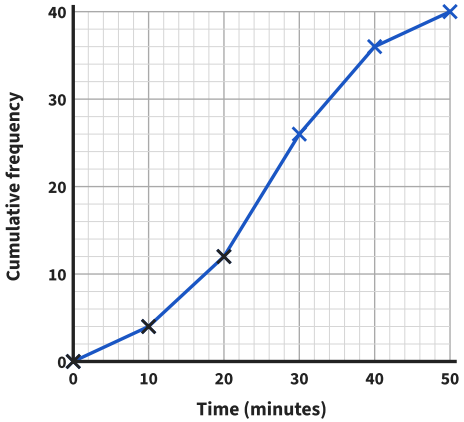
Cumulative frequency

ANSWERS

1 cumulative frequency = running total

Complete the table, then draw the cumulative frequency graph. Plot each running total at the upper class boundary.

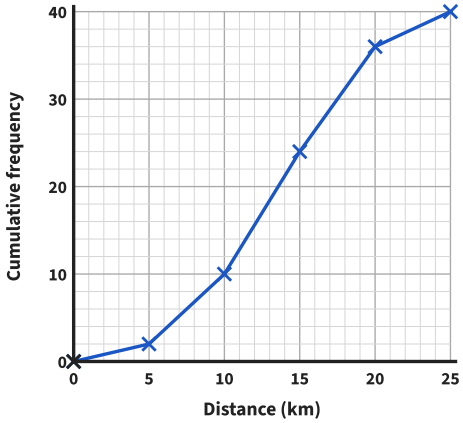
Time (minutes)	Frequency	Cumulative frequency
$0 < t \leq 10$	4	4
$10 < t \leq 20$	8	12
$20 < t \leq 30$	14	26
$30 < t \leq 40$	10	36
$40 < t \leq 50$	4	40



2

Complete the table and draw the cumulative frequency graph.

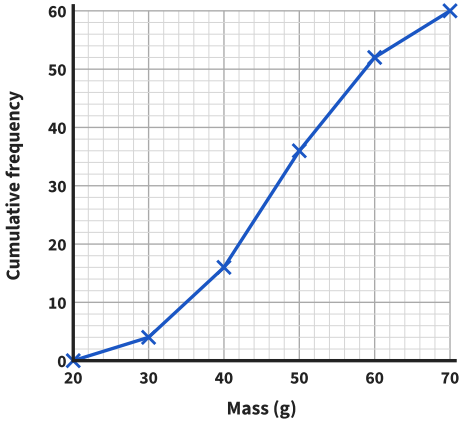
Distance (km)	Frequency	Cumulative frequency
$0 < d \leq 5$	2	2
$5 < d \leq 10$	8	10
$10 < d \leq 15$	14	24
$15 < d \leq 20$	12	36
$20 < d \leq 25$	4	40



3 Notice the change!

Complete the table and draw the cumulative frequency graph.

Mass (g)	Frequency	Cumulative frequency
$20 < m \leq 30$	4	4
$30 < m \leq 40$	12	16
$40 < m \leq 50$	20	36
$50 < m \leq 60$	16	52
$60 < m \leq 70$	8	60

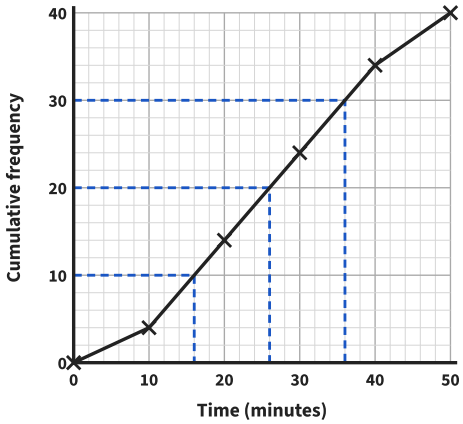


4

There are 40 values. Use the graph to find the median, the quartiles and the interquartile range.

	How far up	Read across
Lower quartile	10	16
Median	20	26
Upper quartile	30	36

Interquartile range 20



Cumulative frequency

ANSWERS

5

The graph shows the masses of 120 parcels. Find the median and the interquartile range.

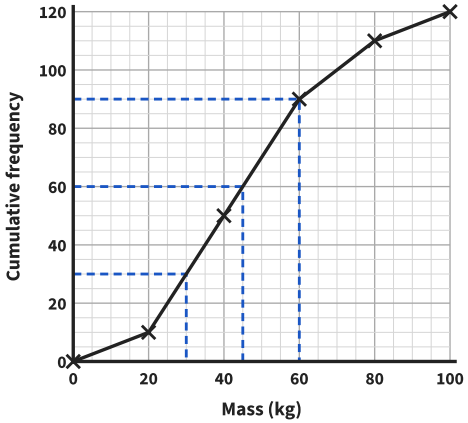
½ of 120 = 60, across: 45

30 → 30, and 90 → 60

60 – 30 = 30

Median 45 kg

IQR 30 kg



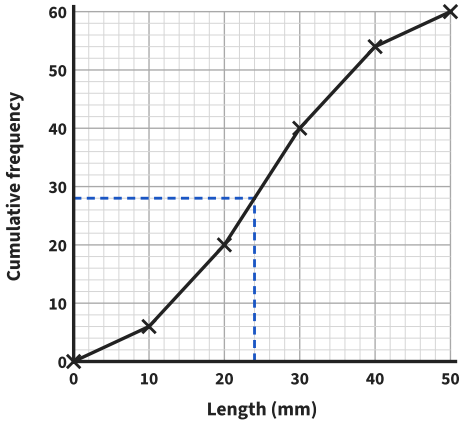
6

The graph shows the lengths of 60 leaves. How many leaves are less than 24 mm long?

Go up from 24 to the graph, then across to the scale.

Up from 24, across: 28

Answer 28 leaves



7

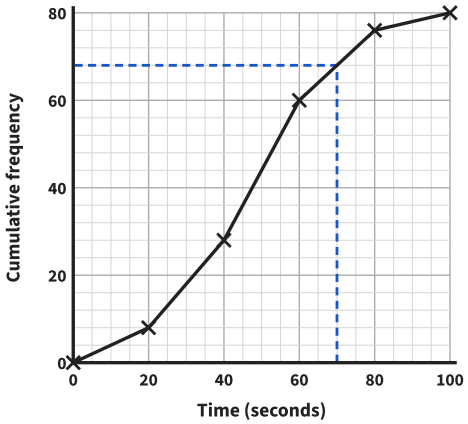
The graph shows how long 80 people took to fill in a form. How many took more than 70 seconds?

Go up from 70 to the graph, then across. Take that from the total.

Less than 70: 68

80 – 68 = 12

Answer 12 people



8

Explain Leo's mistake. Write down the points he should plot.

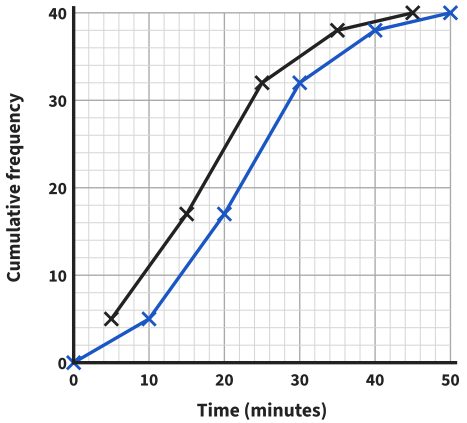
Leo drew this cumulative frequency graph. He plotted each running total at 5, 15, 25, 35 and 45.

Plot at the end of each class

(0, 0), (10, 5)

(20, 17), (30, 32)

(40, 38), (50, 40)



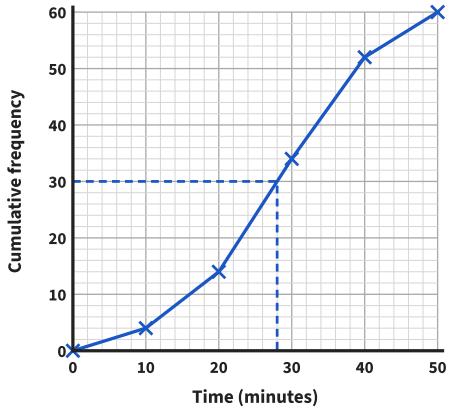
Cumulative frequency *further practice*

ANSWERS

9

The table shows how long 60 people spent in a library. Draw the cumulative frequency graph and use it to find the median.

Time (minutes)	Frequency	Cumulative frequency
$0 < t \leq 10$	4	4
$10 < t \leq 20$	10	14
$20 < t \leq 30$	20	34
$30 < t \leq 40$	18	52
$40 < t \leq 50$	8	60



Median 28

10

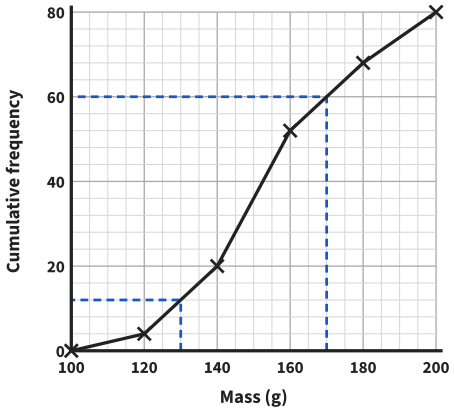
The graph shows the masses of 80 pumpkins. Estimate how many have a mass between 130 g and 170 g.

Less than 170: 60

Less than 130: 12

60 – 12 = 48

Estimate 48



11

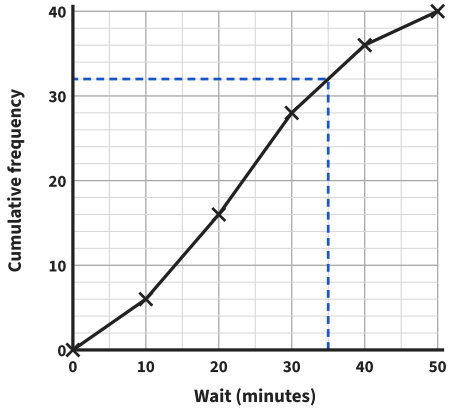
The graph shows how long 40 patients waited at a dentist. What percentage waited more than 35 minutes?

Less than 35: 32

40 – 32 = 8

8 ÷ 40 × 100

Percentage 20%

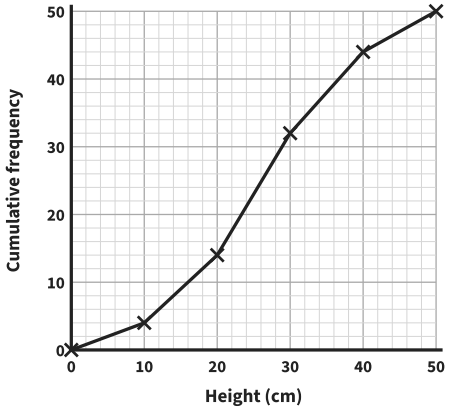


12

The graph shows the heights of 50 seedlings. Complete the frequency table. Which class has the median?

Height (cm)	Frequency
$0 < h \leq 10$	4
$10 < h \leq 20$	10
$20 < h \leq 30$	18
$30 < h \leq 40$	12
$40 < h \leq 50$	6

Median class $20 < h \leq 30$



Cumulative frequency *further practice*

ANSWERS

13

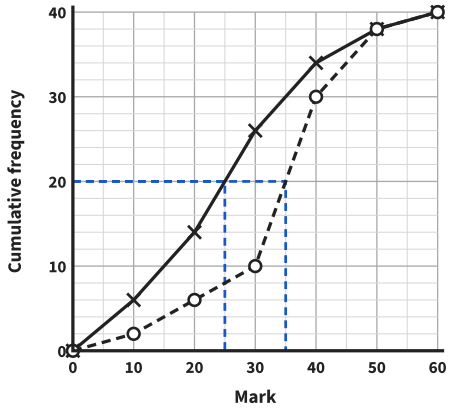
The test marks of class A (crosses) and class B (circles), 40 students each.
Compare them using the medians and interquartile ranges.

A: median 25, IQR 35 – 15 = 20

B: median 35, IQR 40 – 30 = 10

B scored higher on average

B's marks were more consistent



14

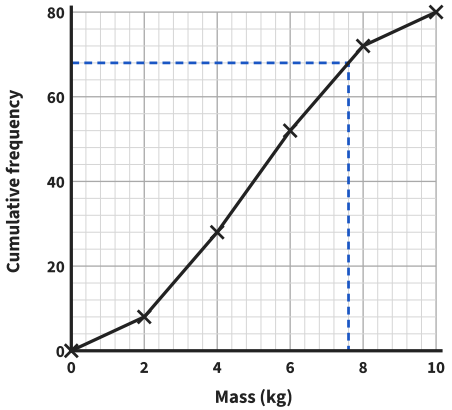
The graph shows the masses of 80 suitcases. The heaviest 15% get a heavy label.
Estimate the lightest mass that gets a label.

15% of 80 = 12

80 – 12 = 68

Across from 68: 7.6

Mass 7.6 kg

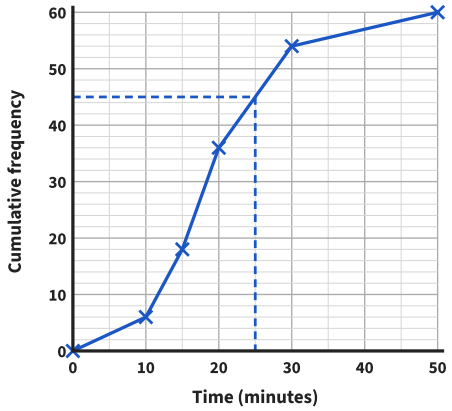


15

Draw the cumulative frequency graph. The classes are different widths.
Then estimate the upper quartile.

Time (minutes)	Frequency	Cumulative frequency
$0 < t \leq 10$	6	6
$10 < t \leq 15$	12	18
$15 < t \leq 20$	18	36
$20 < t \leq 30$	18	54
$30 < t \leq 50$	6	60

Upper quartile 25



16

Is Ava right? Show how you decide.

Ava says that half of the 80 runners finished in under 30 minutes.

Up from 30, across: 36

Half of 80 is 40

36 is less than 40, so Ava is wrong

