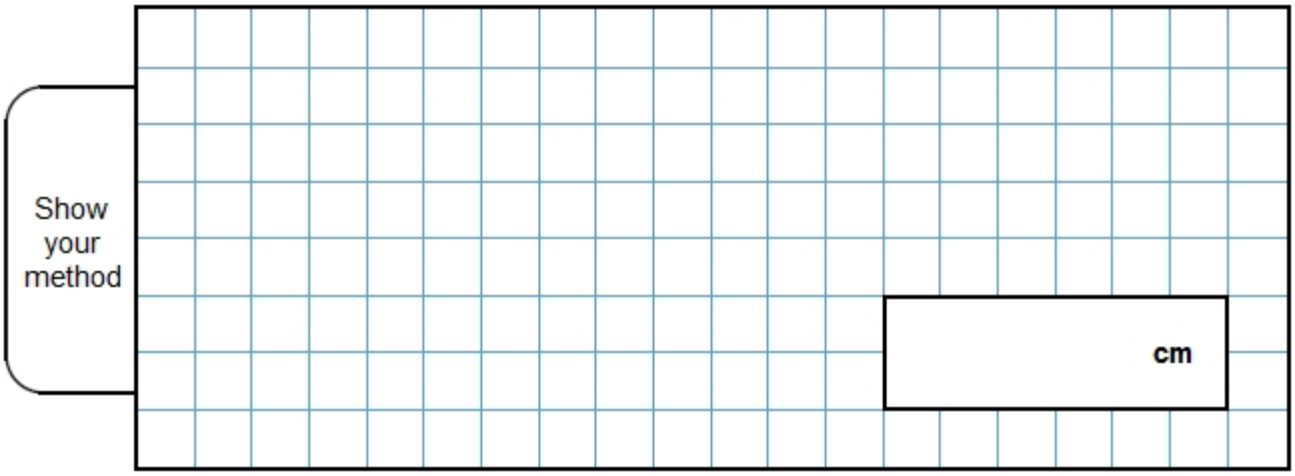
1 Seven children measured their heights.

Children	Height (cm)
Stefan	144
Lara	136
Olivia	142
Chen	143
Maria	152
Dev	148
Sarah	150

What is the mean height of the children?



2 marks

2 Last year, Jacob went to four concerts.

Three of his tickets cost £5 each.

The other ticket cost £7

What was the **mean** cost of the tickets?

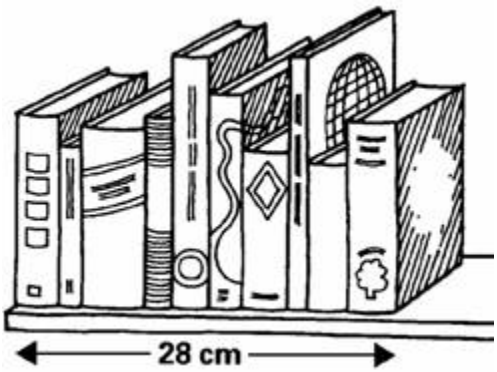
Show your method

£

2 marks

3 Vicki puts 10 books on a shelf.

The **10 books** take up **28 centimetres**.



What is the **mean (average)** thickness of her books?

Show your method

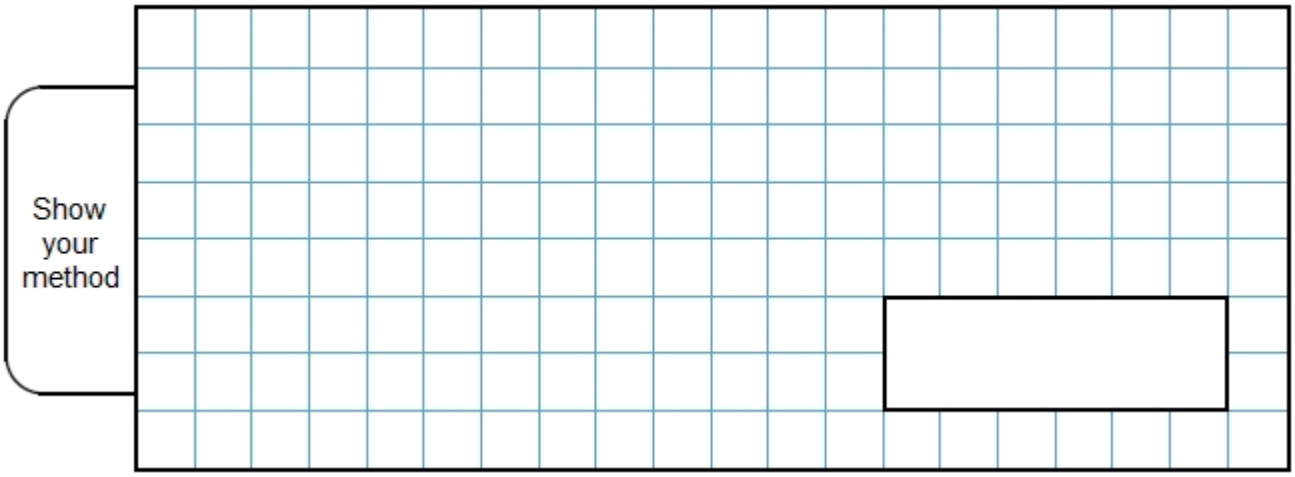
cm

2 marks

The shelf is **120 centimetres** long.

Vicki fills the shelf with a mixture of books like the **first ten books.**

Estimate how many books she can get on the **120 cm shelf**.

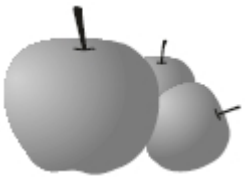


2 marks

4 Three apples have a **mean** (average) mass of 100 grams.

The largest apple is removed.

The **mean** mass of the remaining two apples is 70 grams.



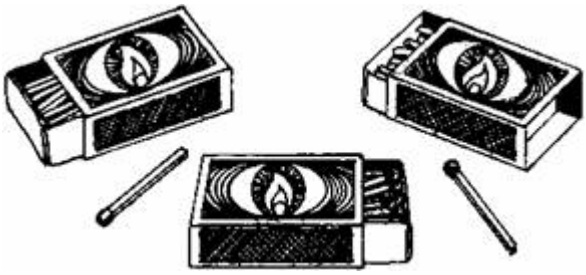
What is the mass of the largest apple?

Show your method

g

2 marks

5



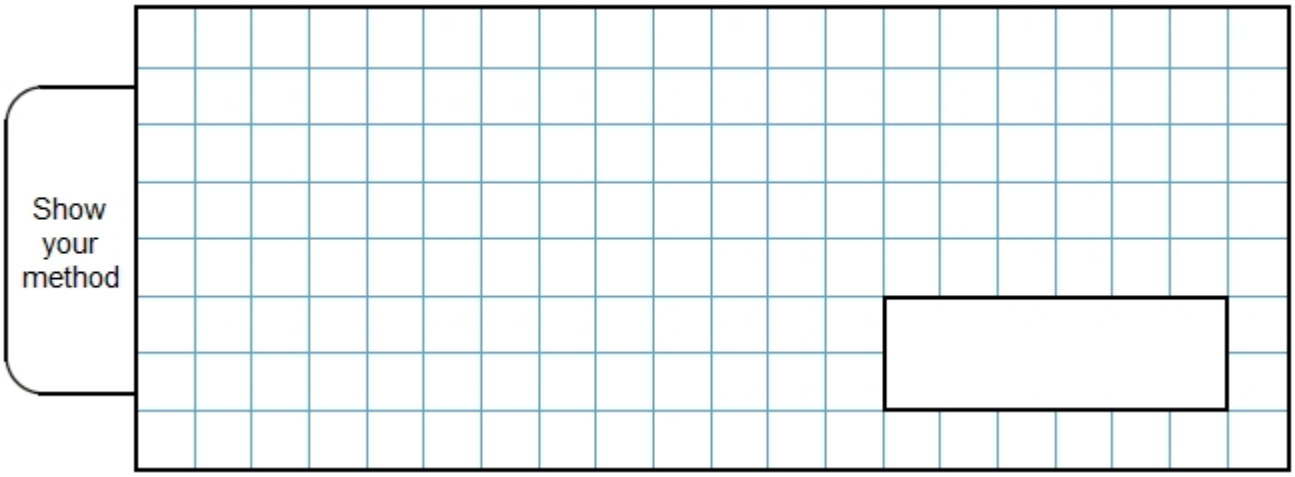
Carol counts the matches in **10** boxes.

She works out that the **mean** number of matches in a box is **51**

Here are her results for **9 boxes**.

1st January						
48	49	50	51	52	53	54
	✓ ✓ ✓	✓ ✓	✓	✓		✓ ✓

Calculate how many matches are in the **10th box**.



2 mark

6 Megan goes on a walking holiday for five days.

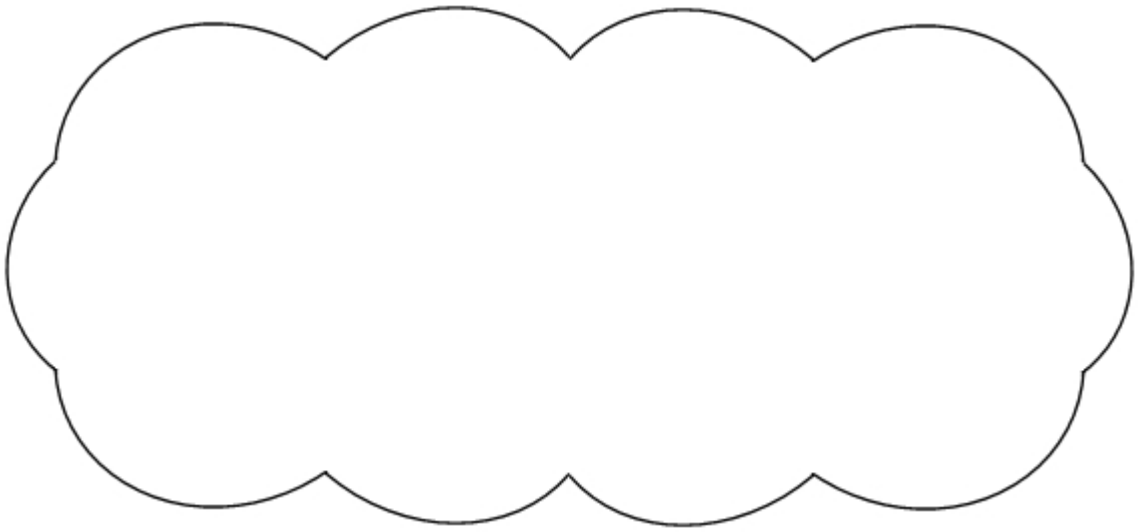
The table shows how far she walked on the first four days.

Monday	Tuesday	Wednesday	Thursday
14 km	23 km	13 km	13 km

Megan says,

'My average for the first four days is more than 15 km.'

Explain why Megan is **correct**.

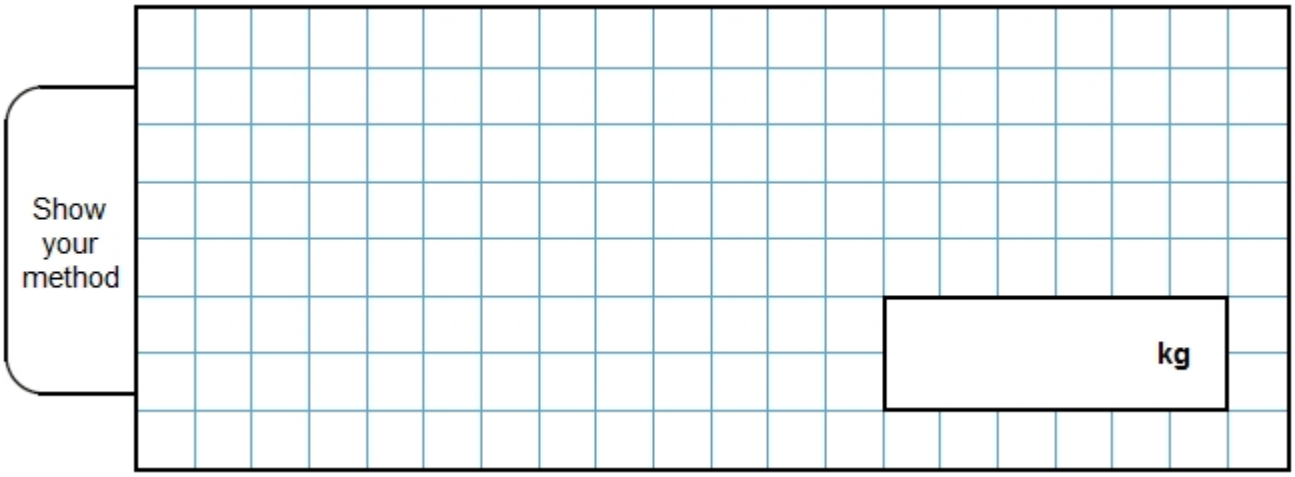


1 mark

Friday is her last day.

She wants to increase her average to **17 km**.

How many kilometres must she walk on Friday?



2 marks

Mark schemes

1 Award **TWO** marks for the correct answer of 145

If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g:

- 144
  136
  142
  143
  152
  148
  + 150
  1015

1015 ÷ 7

*Answer need not be obtained for the award of **ONE** mark.*

Up to 2

[2]

2 Award **TWO** marks for the correct answer of £5.50

If the answer is incorrect, award **ONE** mark for:

- sight of 22 ÷ 4

OR

- evidence of appropriate method, e.g.
  - 3 tickets cost 3 × £5 = £15
    1 ticket costs £7
    £15 + £7 = £22
    £22 ÷ 2 ÷ 2

    *For **ONE** mark, accept an answer of £550, £550p or £5.5 as evidence of appropriate method.*

    *Answer need not be obtained for the award of **ONE** mark.*

Up to 2m

[2]

3 (a) Award **TWO** marks for correct answer of 2.8 cm.
If answer is incorrect, award **ONE** mark for any appropriate calculation even if the answer is incorrect, eg:

- 28 ÷ 10 = wrong answer.

*A calculation **MUST** be performed for award of one mark.*

Up to 2

(b) Award **TWO** marks for WHOLE NUMBER ANSWER in the range 40 to 50 inclusive, eg:

- 42.8

If answer is outside range, award **ONE** mark for an appropriate calculation, eg:

- 120 ÷ 28 × 10 = wrong whole number answer.
- 120 ÷ 30 × 10 = wrong whole number answer.
- 30cm is 10 books.
  60cm is 20 books.
  120cm is ... wrong answer.

*If answer is outside range, a calculation **MUST** be performed for award of one mark. If calculation is based upon incorrect answer to 16a, award **TWO** marks for correct calculation using an appropriate strategy **AND** rounding of answer to whole number, even if outside range 40–50, eg:*

- *120 ÷ answer to 16a = rounded whole number.*
  OR
  ONE mark if there is either an error in calculation or failure to round to whole number.

Up to 2

[4]

4 160

! Measures

See guidance

2

or

Shows or implies a complete correct method, eg:

- 3 × 100 = 300

  2 × 70 = 140

  300 – 140

1

[2]

5 Award **TWO** marks for the correct answer of 52

If the answer is incorrect award **ONE** mark for evidence of an appropriate method, eg

51 × 10 = 510

so number of matches =

510 – ((49 × 3) + (50 × 2) + (54 × 2) + 51 + 52)

The calculation need not be completed for the award of the mark.

Up to 2

[2]

6 (a) Gives a correct explanation, eg:

- Her average is 15.75
- 14 + 23 + 13 + 13 = 63
  63 ÷ 4 is more than 15
- If the average is 15, Monday Wednesday and Thursday total 5 below and Tuesday is 8 above so the average must be > 15
- To walk an average of 15 km a day you need to have walked 60 km. Megan has walked 63 km so she is over the average of 15 km

Accept minimally acceptable explanation, eg:

- *63 ÷ 4*
- *63 ÷ 4 =16*
- *63 ÷ 4 = 15 r 3*

***Do not accept** incomplete or incorrect explanation, eg:*

- *If you add up how far she walked in four days and divide by 4, it's more than 15*
- *14 + 23 + 13 + 13 = 63*
- *63 ÷ 4 = 15*

1

(b) 22

! Follow-through of incorrect total or average

*For 2m or 1m, accept follow-through from incorrect value for the average **or** the total calculated for part (a) used correctly in part (b), eg:*

- *for 16 as answer in part (a), award 2 marks for 85 – 4 × 16 = 21*

2

or

85 seen (*the total for 5 days*)

! Correct embedded solutions

Award 1m, for a response which shows 22 as the embedded solution to their working

OR

Shows or implies a complete correct method, eg:

- (17 × 5) − 14 − 23 − 13 − 13
- 17 × 5 = 80 (*error*)
  80 − 63

1

[3]

3 Decimals and fractions

Many children who scored well overall showed a lack of confidence and competence with decimals. Test A question 16 presented a problem about 10 books on a shelf taking up 28 centimetres. Children were asked to find the average thickness of the books. Though many of the higher achieving children did the correct calculation (28 cm divided by 10) a significant number expressed it as *2 remainder 8* and could not interpret this correctly in decimal form. For example, Shaun was able to do this and then wrote his answer as 2.8 whilst Ricky used a diagram to help him interpret it - this produced an answer of 3 cm which was not sufficiently accurate.