

## Week 24

Pie charts and averages

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_

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Time: **28 minutes**

Marks: **27 marks**

Comments:

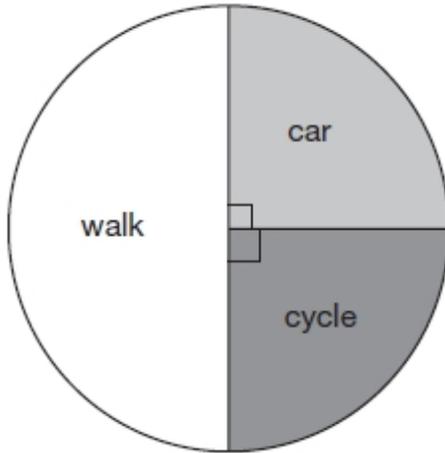
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1

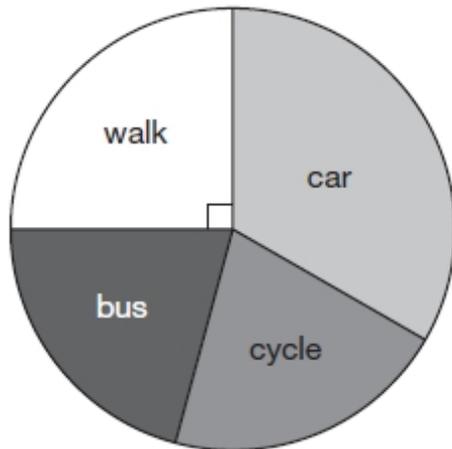
Megan asked children from two different schools,

***'How do you travel to school?'***

Here are her results.



Foxwood school  
**80** children



Midtown school  
**240** children

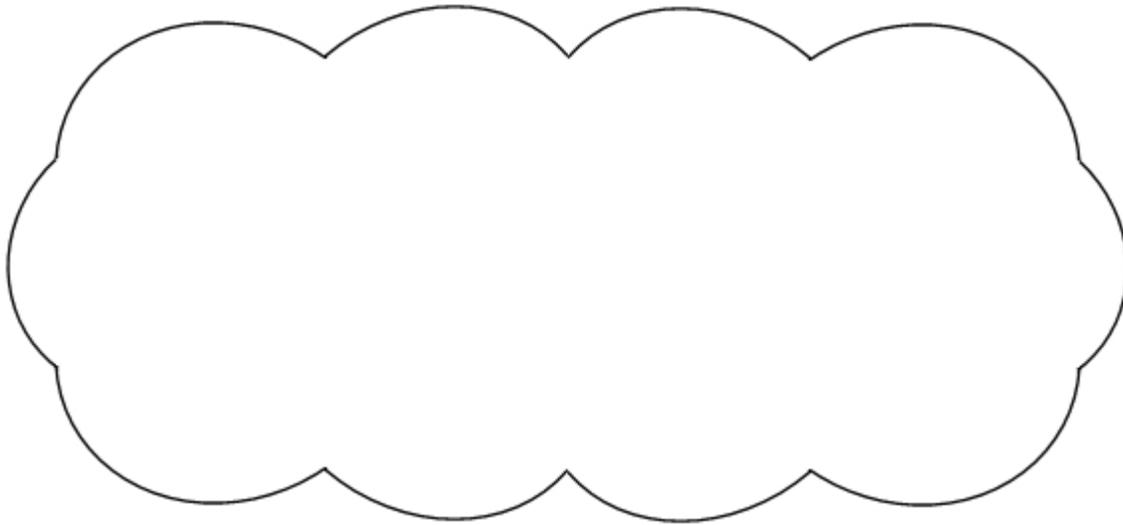
Megan says,

***'The number of children walking to Foxwood school is more than the number walking to Midtown school.'***

Is she correct?  
Circle **Yes** or **No**.

Yes / No

Explain how you know.



1 mark

At Midtown school, one third of children travel by car.

The number of children who cycle is the same as the number who go on the bus.

How many children **cycle** to Midtown school?

Show your method

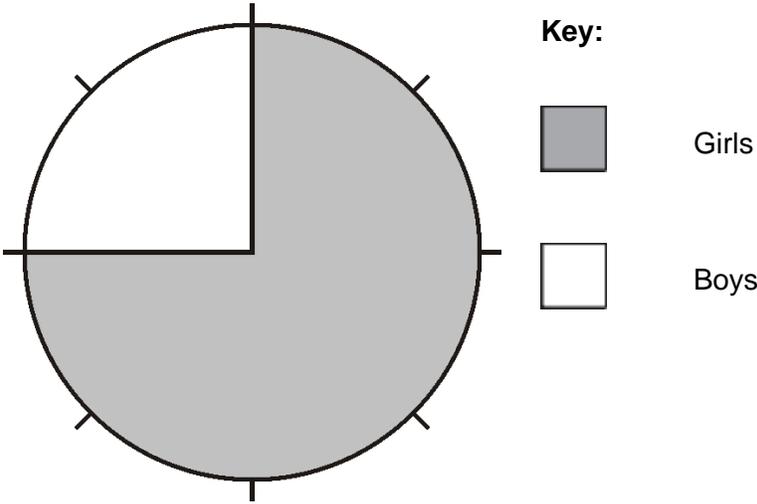
A large grid for showing the student's work. The grid is 20 units wide and 10 units high. On the left side, there is a rounded rectangular box containing the text "Show your method". In the bottom right corner of the grid, there is a smaller, empty rectangular box for the final answer.

2 marks

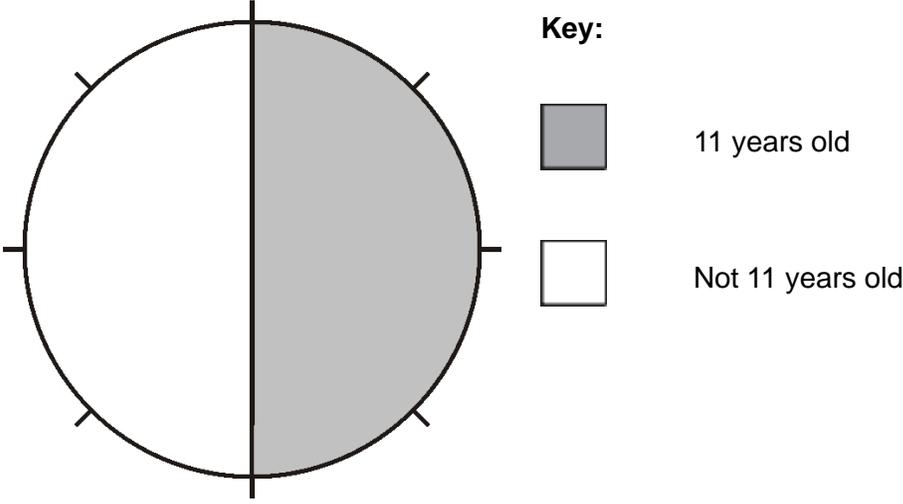
2

Look at the information in these two pie charts.

**Pupils in class 6K**

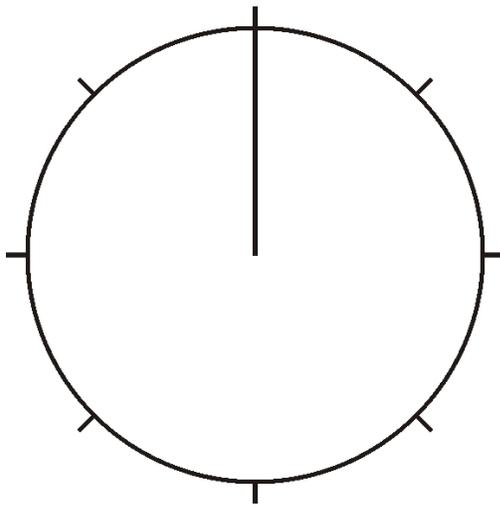


**Girls in class 6K**



Use the information in the two pie charts to complete the pie chart below.

**Pupils in class 6K**



**Key:**



11 years old girls



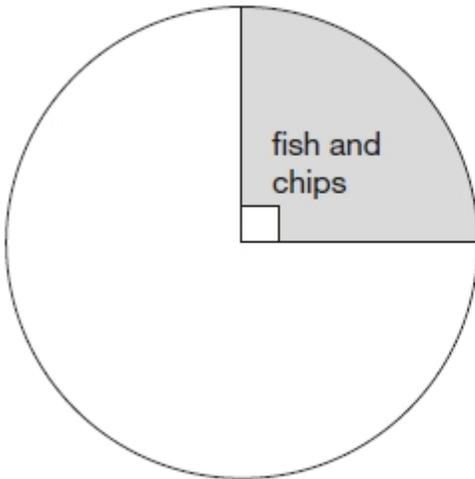
All other pupils in the class

1 mark

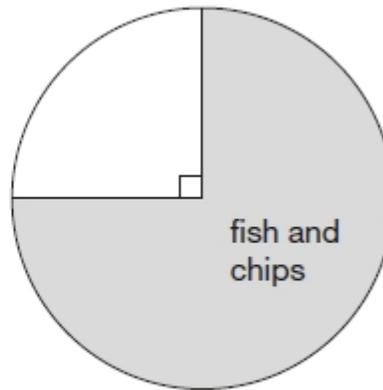
**3**

200 girls and 100 boys were asked about their favourite meal.

These pie charts show the results.



200 girls



100 boys

Look at the pie charts.

For each statement put a tick (✓) if it is true or a cross (X) if it is false.

Three-quarters of the boys chose fish and chips.

Three times as many boys as girls chose fish and chips.

Altogether, half of the children chose fish and chips.

25 more boys than girls chose fish and chips.

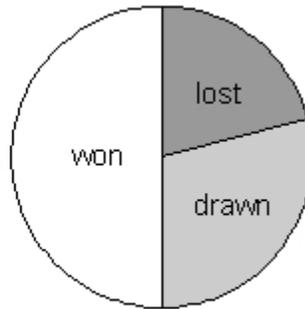
2 marks

4

The pie charts show the results of a school's netball and football matches.



Netball



Football

The netball team played **30** games.

The football team played **24** games.

Estimate the percentage of games that the **netball team lost**.

1 mark

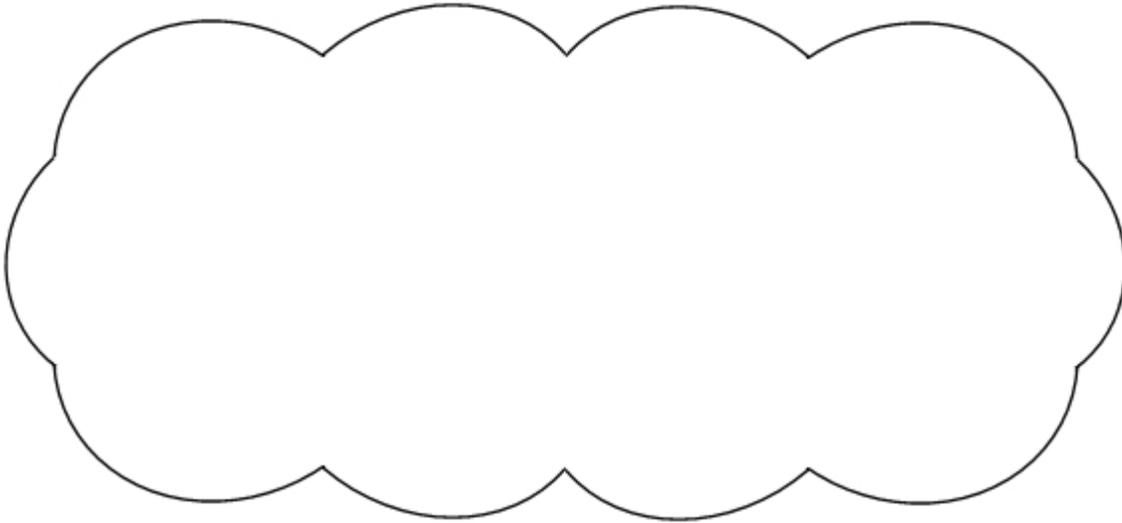
David says,

***'The two teams won the same number of games'.***

Is he correct?  
Circle Yes or No.

Yes / No

Explain how you know.

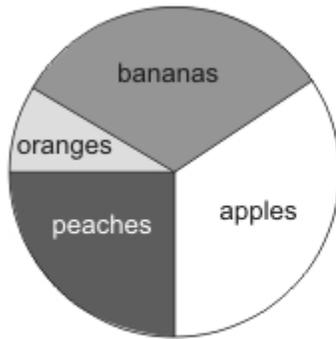


1 mark

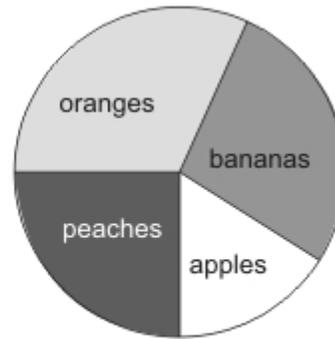
5

Some children work out how much money two shopkeepers get from selling fruit.

They use pie charts to show this.



Mrs Binns



Mr Adams

Mrs Binns gets **£350** selling **bananas**.

Estimate how much she gets selling **oranges**.

£

1 mark

Mrs Binns gets a total of £1000 and Mr Adams gets a total of £800

Estimate how much **more** Mrs Binns gets than Mr Adams for selling **peaches**.

£

1 mark

6

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?

Show your method

cm

2 marks

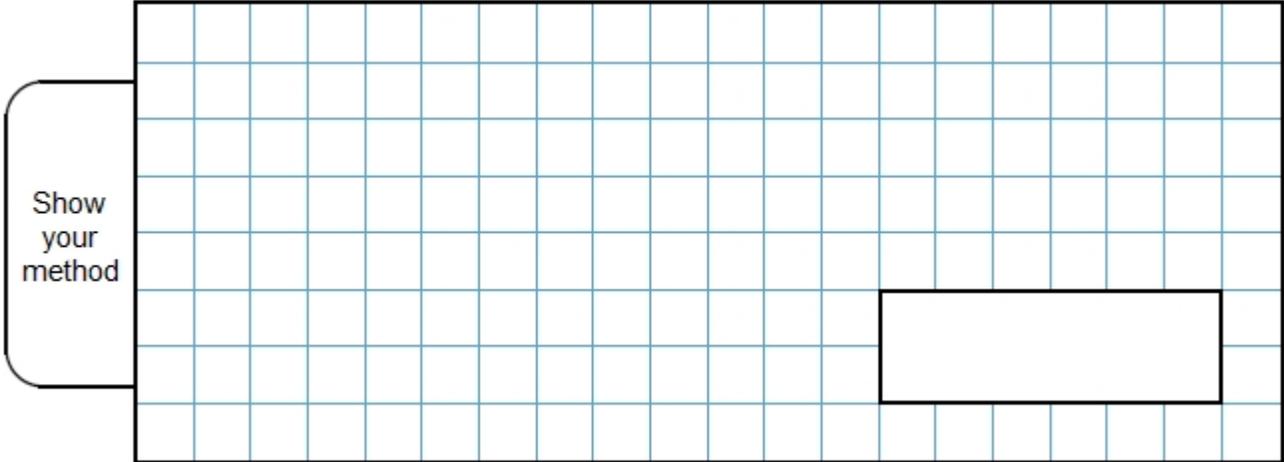


The shelf is **120 centimetres** long.

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**.

Show your method



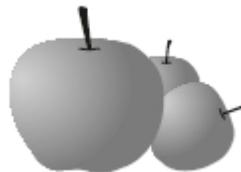
2 marks

8

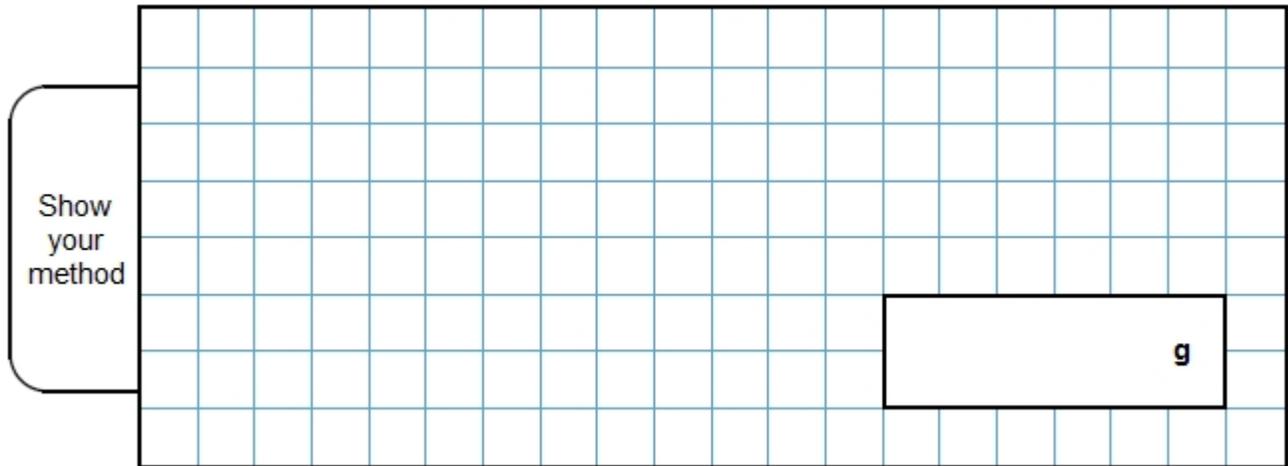
Three apples have a **mean** (average) mass of 100 grams.

The largest apple is removed.

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



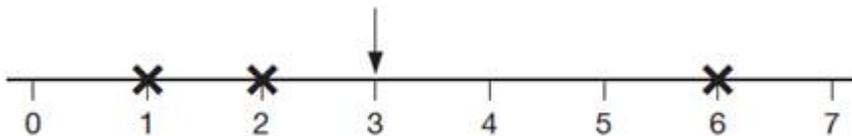
What is the mass of the largest apple?



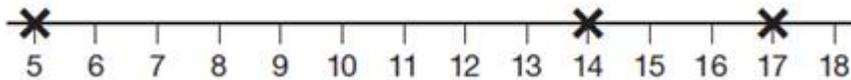
2 marks

9

The arrow below points to the **mean** of the three numbers shown by crosses.



(a) Draw an arrow that points to the mean of the three numbers shown below.

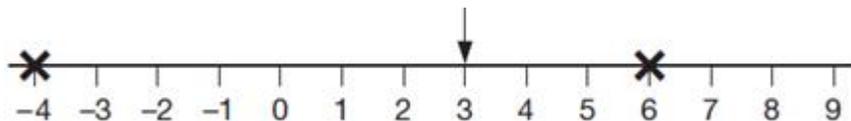


1 mark

(b) The arrow below points to the mean of three numbers.

One of the numbers is missing.

Draw a cross to show the position of the missing number.



1 mark

**10**

A, B and C stand for three different numbers.

**The mean of A and B is 40**

**The mean of B and C is 35**

**$A + B + C = 100$**

Calculate the values of **A**, **B** and **C**.

Show your method

|            |            |            |
|------------|------------|------------|
| <b>A =</b> | <b>B =</b> | <b>C =</b> |
|------------|------------|------------|

2 marks

**11**

Megan goes on a walking holiday for five days.

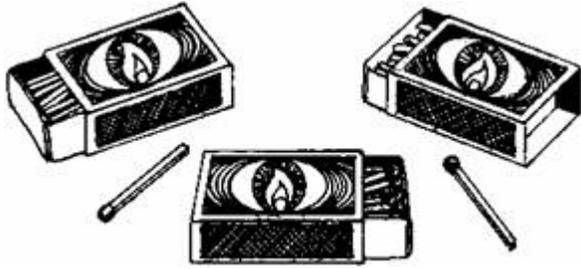
The table shows how far she walked on the first four days.

| 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.'***





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.

Show your method

A large grid for showing the method. The grid is 10 columns wide and 10 rows high. On the left side, there is a rounded rectangular box containing the text "Show your method". On the right side, there is a smaller rectangular box, approximately 4 columns wide and 2 rows high, which is currently empty.

2 mark

## Mark schemes

1

- (a) An explanation that shows that one quarter of 240 is more than one half of 80, eg:

- 'Because only 40 are walking to Foxwood and 60 are walking to Midtown'
- 'Half of the people who walk is 40 and a quarter of the people who walk is 60'

*No mark is awarded for circling 'No' alone.*

**Do not** accept vague or incomplete explanations, eg:

- 'Because at Foxwood it's a half and at Midtown it's a quarter'
- 'Because there are 80 children at Foxwood and 240 children at Midtown'

*If 'Yes' is circled but a correct unambiguous explanation is given then award the mark.*

1  
U1

- (b) Award **TWO** marks for the correct answer of 50

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

$$240 \div 3 = 80$$

$$240 - 80 - 60 = 100$$

$$100 \div 2$$

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

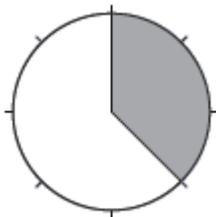
Up to 2

[3]

2

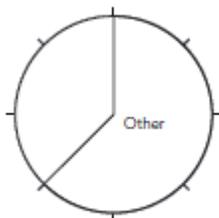
Divides the pie chart into two correct sectors and shades/labels correctly, eg

•



*Accept unambiguous indication of shading/labelling, eg*

•



*! Given key ignored*

*Condone incorrect shading provided their labelling is unambiguous eg, accept*

•

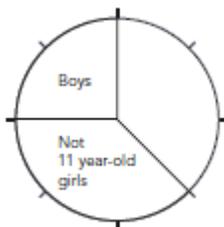


*! Additional sectors shown*

*Ignore provided the sector(s) for 11 year-old girls are clearly indicated*

*eg, accept*

•



[1]

3

Indicates all four correctly, ie:



*! Incomplete response*

*For 2 marks, do not accept any box left blank*

*! Other indication*

*Accept any unambiguous indication, eg:*

- *'Y' for ticked*

2

**or**

Indicates any three correctly

1

[2]

4

(a) Answer in the range 30% to 36% inclusive.

1

(b) An explanation which recognises that both teams won half their games, but both teams played a different number of games, eg

- Half of 30 is not the same as half of 24
- Because of 30 e 15 but of 24 = 12
- Because 15 is more than 12

**No mark is awarded for circling 'No' alone.**

**Do not accept vague or arbitrary explanation, eg**

- *The netball team played more games;*
- *Both teams won half their games;*
- *30 is more than 24*

*If 'Yes' is circled but a correct unambiguous explanation is given, then award the mark.*

U1

[2]

- 5** (a) Award **ONE** mark for an answer in the range £85 to £125, **inclusive**. 1
- (b) Award **ONE** mark for the correct answer of £50  
Accept any estimate in the range £45 to £55, **inclusive**. 1
- [2]**

**6** 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

$1015 \div 7$

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

**Up to 2**

**[2]**

- 7** (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:

- $28 \div 10 =$  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:

- $120 \div 28 \times 10 =$  wrong whole number answer.
- $120 \div 30 \times 10 =$  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:*

- $120 \div$  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]

8

160

*! Measures  
See guidance*

2

**or**

Shows or implies a complete correct method, eg:

- $3 \times 100 = 300$   
 $2 \times 70 = 140$   
 $300 - 140$

1

[2]

9

(a) Draws an arrow pointing to 12

*Accept unambiguous indication of 12, eg:*

- an arrow drawn within 2mm of the mark for 12
- 12 circled

1

(b) Draws a cross on 7

*Accept unambiguous indication of 7, eg:*

- a cross drawn within 2mm of the mark for 7
- 7 circled

1

[2]

10

Award **TWO** marks for the correct answer as shown:

$$A = \boxed{30} \quad B = \boxed{50} \quad C = \boxed{20}$$

*All three numbers must be correct for the award of the mark.*

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

$$A + B = 80$$

$$B + C = 70$$

$$A + 2B + C = 150$$

$$100 + B = 150$$

*Accept for **ONE** mark the correct three numbers but written in the incorrect boxes.*

Up to 2

[2]

11

(a) Gives a correct explanation, eg:

- Her average is 15.75
- $14 + 23 + 13 + 13 = 63$   
 $63 \div 4$  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:*

- $63 \div 4$
- $63 \div 4 = 16$
- $63 \div 4 = 15 \text{ r } 3$

**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
- $14 + 23 + 13 + 13 = 63$
- $63 \div 4 = 15$

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  $85 - 4 \times 16 = 21$

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:

- $(17 \times 5) - 14 - 23 - 13 - 13$
- $17 \times 5 = 80$  (error)  
 $80 - 63$

1

**[3]**

**12**

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

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

$$51 \times 10 = 510$$

so number of matches =

$$510 - ((49 \times 3) + (50 \times 2) + (54 \times 2) + 51 + 52)$$

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

Up to 2

[2]