Unit 4
Problem solving 1

Five daily lessons

National **Numeracy** *Strategy*

Year 6
Summer term

Unit Objectives
Year 6

• **Solve a problem by** representing, **extracting and interpreting data in tables, graphs, charts** and diagrams, including those generated by a computer, e.g. line graphs, frequency tables and bar charts with grouped discrete data.	Pages 115, 117
• Find the mode and range of a set of data. Begin to find the median and mean of a set of data.	Page 117
• Use the language associated with probability to discuss events, including those with equally likely outcomes.	Page 113
• **Identify and use appropriate operations (including combinations of operations to solve word problems involving numbers and quantities)** based on 'real life' or money, using one or more steps.	Pages 82–89
• **Explain methods and reasoning.**	Pages 82–89

Link Objectives

Year 5

- Solve a problem by representing and interpreting data in tables, charts, graphs and diagrams, including those generated by a computer.
- Find the mode of a set of data.
- Discuss the chance or likelihood of particular events.
- **Use all four operations to solve simple word problems involving numbers and quantities** based on 'real life' money and measures **including time.**
- Explain methods and reasoning.

Year 7

- Given a problem that can be addressed by practical methods, suggest possible answers.
- Calculate statistics for small sets of discrete data.
- Interpret diagrams and graphs.
- Given two simple distributions use the range and one of the mode, median or mean.
- **Understand and use the probability scale from 0 to 1.**
- **Solve word problems and investigate in a range of contexts.**

(Key objectives in bold)

This Unit Plan is designed to guide your teaching.

You will need to adapt it to meet the needs of your class.

Resources needed to teach this unit:

- Resource sheet 4.1
- Resource sheet 4.2
- Activity sheet 4.1
- Activity sheet 4.2
- OHT 4.1
- OHT 4.2
- OHT 4.3
- OHT 4.4
- OHT 4.5
- OHT 4.6
- OHT 4.7
- OHT 4.8
- OHT 4.9
- Mental mathematics test questions (Unit 1)
- Timer
- Whiteboards
- Large sheet of paper
- Coloured cubes and container
- Calculator

department for education and skills

Planning sheet	Day One (page 1 of 2)	Unit 4 *Problem solving 1*	Term: *Summer*	Year Group: *6*

Oral and Mental

Objectives and Vocabulary

Count on in steps of 0.1, 0.2, 0.25, 0.5, and then back.

VOCABULARY
interval
step
sequence
metre (m)
centimetre (cm)
kilometre (km)
equivalent

RESOURCES
Timer
Mental mathematics test questions (Unit 1)

Teaching Activities

- Use a number line, label some intervals and explain that the steps between the intervals are equal, e.g.

In pairs, the children identify the intervals and complete the sequence from the first mark on the line to the last. Point to a specific mark.

> **Q** What is the value at this point?

Change 100 to 10, and 25 to 2.5 and get the children to identify values of marks on lines. Discuss strategies.

- Repeat with examples to include: decimal steps; negative numbers; sequences which could not include zero;

(e.g. __,5,__,21,__,37,__, …)

Give the children a selection of mental mathematic questions to answer under timed conditions. Correct answers and discuss their methods. Correct any errors.

Main Teaching

Objectives and Vocabulary

Solve a problem by extracting and interpreting data in tables, graphs, charts and diagrams.

VOCABULARY
bar chart
grouped data
range
axis

RESOURCES
OHT 4.1
Resource sheet 4.1
OHT 4.2
OHT 4.3
OHT 4.4
Large sheet of paper

Teaching Activities

- Show OHT 4.1 and give out Resource sheet 4.1. Discuss the table with the class and establish that children understand the point system.

> **Q** How many points for a jump of 1.3 m, a jump of 60 cm, a jump of 2.14 m?

- Correct answers and ensure children recognise how to score points for a jump of 139 cm and 140 cm.

> **Q** If a team of six jumped what could their lowest and highest scores be?

- Establish these are 0 and $6 \times 8 = 48$ points.

> **Q** How could this team hope to achieve a score of 32 points?

- Correct answers and consider alternatives.

> **Q** If one of the team scores 5 points, what distance might their jump have been?

Ensure the children can describe the range of possible jumps in cm and m. Remind them that all the jumps are measured to the nearest cm.

> **Q** One team member jumped 1.48 cm, how much further did she need to jump to score 6 points?

Continue to ask questions that help the children to interpret the data on the table.

- Show OHT 4.2.

> **Q** What is the bar chart showing?

Encourage the children to identify the intervals and relate these to the points table on Resource sheet 4.1. Ensure that they understand how the jumps have been grouped.

> **Q** How many pupils jumped further than 1.6 m?

Correct answers and ensure the children can interpret the axes.

> **Q** What were the most common distances jumped?

Agree the range of jumps.
Continue to ask questions that help the children to interpret the bar chart.

> **Q** Do we know the exact distance each pupil jumped?

Establish that it is not possible to identify exact distances, only the range of distances for groups of pupils.

Plenary

Teaching Activities/Focus Questions

- Ask the children to identify the key points they should remember when interpreting data represented in a table or graph. Discuss responses and note them on a large sheet of paper for display.

- Show OHT 4.3 and discuss the information in the table.

> **Q** If I park at 9:40 and leave at 11:19, how much will it cost me?

Discuss answers and correct when appropriate. Ask the children other questions involving time, include am, pm and then 24-hour time.

> **Q** If the car park opens at 8:30 am, and by 9:30 am 85 cars have parked and gone, how much money has been taken?

Continue to ask questions that involve the children in calculations that require them to use the data in the table.

Planning sheet	Day One (page 2 of 2)	Unit 4 *Problem solving 1*	Term: *Summer*	Year Group: *6*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
			• Remind the children of the point system on Resource sheet 4.1. **Q** What total points would be allocated to pupils who jumped 1 m and 1.19 m? With the class, work out the total points allocated to each group of pupils. **Q** How could we represent this data as a graph? Discuss alternatives. Identify the scales needed for each axis and the labels to be used. Ask the children to draw their graphs. • Discuss the features of their graphs. Show OHT 4.4 and ask the children to interpret it. Explain that there is an error in the graph, and ask them to identify it. **Q** How many pupils jumped? What is the total number of points scored? Correct and discuss answers. (120–139 bar: number of points should be a multiple of 3.)	**By the end of the lesson the children should be able to:** • **Know that for grouped data, the bars may be labelled with the range that they represent.** (Refer to supplement of examples, section 6, page 115.)

Planning sheet	Day Two	Unit 4 *Problem solving 1*	Term: *Summer*	Year Group: *6*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Solve word problems involving money. VOCABULARY rounding up adjusting RESOURCES Whiteboards	• Write on the board: A 29p B 39p C 49p H 99p Say these represent the cost of different bars of chocolate. **Q** If I buy a bar of C and a bar of H, how much does this cost me? The children write answers on whiteboards. Correct answers and discuss strategies. Remind the children of the rounding up and adjusting strategy. Encourage them to make things. Repeat using different pairs. • Say this time you want them to give you the change from £5. **Q** If I buy 4 bars of C, how much change do I get? Collect answers and discuss strategies. Share examples of jottings and get the children to explain them. Repeat using other examples.

Main Teaching

Objectives and Vocabulary	Teaching Activities
Solve a problem by extracting and interpreting data in line graphs and pie charts. VOCABULARY line graph axes interval pie chart percentage fraction RESOURCES Activity sheet 4.1 OHT 4.5 OHT 4.6	• Give out Activity sheet 4.1. Discuss the graphs with the class. Ensure the children understand that the graph shows Dave's daily temperature in °C. **Q** What was Dave's temperature on 6 June? Make sure the children can interpret the crosses and the scale. **Q** Can we join up the crosses with straight lines? Ensure the children understand that the crosses represent Dave's temperature at noon. The straight lines represent the change in his temperature from noon each day although Dave's temperature might fluctuate. The straight lines are unlikely to be accurate but they do show trends up and down. Get the children to draw in the straight lines with a ruler and pencil. • Ask the children to complete the sheet on their own. Correct answers and discuss each question. Remind the children that they should give clear but short explanations and agree a form afterwards with the class that demonstrates this. Explain that in a test they should annotate a graph if it helps them to answer the question. Show the children how to use annotations to answer the questions, e.g. finding the highest temperature to one decimal place. **Q** What was Dave's temperature to 1 decimal place on 13 June, 17 June? Ensure the children are able to give the necessary degree of accuracy. • Display the first graph on OHT 4.5. Explain to the children that the graph has neither axis labelled but like Dave's temperature graph it is a line graph. **Q** What could this graph represent? How would I need to label the axis? Correct responses and ensure the children recognise that the horizontal axis must be such that every point on the graph must have a meaning. • Explain that the graph shows the height of water in a container. Ask the children to describe the changes in height. **Q** What should we label our axes? Agree the axes show height and time. Discuss and choose suitable units. • Show the second graph. Discuss the difference and highlight key features in the graphs. **Q** How can we explain the vertical lines on the graphs, and the horizontal lines? Ensure the children can interpret their meaning correctly. **Q** When is the container being emptied/filled most frequently? Agree responses, ensure the children understand that to make comparison between graphs, the scales on the axis need to be the same.

Plenary

Teaching Activities/Focus Questions
• Show OHT 4.6. **Q** What is the name of this type of data representation? Say the pie chart represents the numbers of lengths (1–4) swam by a group of children. **Q** What percentage of children swam two lengths? Agree it is 25%. **Q** How many children in the group swam one length? Explain that we only know that the group swam one length. Say there were 48 children in the group. **Q** How many children in the group swam more than two lengths? Agree it is a quarter (25%) of 48 children. Say that the pie chart represents those children in a school of 200, who swam one to four lengths but it does not show the 20% of non-swimmers. **Q** How many children swam three lengths? Correct answers. With the class, work through the steps needed to answer the questions. Make settings on the OHT to show the children how they might annotate the pie chart. **By the end of the lesson the children should be able to:** • **Interpret simple pie charts.** • **Interpret a line graph in which intermediate values have meaning.** (Refer to supplement of examples, section 6, pages 115, 117.)

Planning sheet	Day Three	Unit 4 *Problem solving 1*	Term: *Summer*	Year Group: *6*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Consolidate knowledge of multiplication facts to 10×10 and related division facts. Extract and interpret data from a table. VOCABULARY multiplied by times product divided by how many RESOURCES OHT 4.7	• Display OHT 4.7. Select four numbers between 2 and 10 and write these in the first column, e.g. 3, 6, 7, 8. Point to a box in the grid and ask the children to state the multiplication fact, e.g. $3 \times 4 = 12$. Record the answer in the box, continue, choosing boxes at random, until the table is complete. • Point to one of the numbers in the completed table, e.g. 12. **Q** What two division facts can you state? Correct answers, e.g. $12 \div 3 = 4$, $12 \div 4 = 3$, making sure the children have the correct vocabulary. Repeat for other numbers in the table. • Select a number in the table and state a unit, e.g. minutes. Ask the children to use a number fact and the unit to pose a question or to make a statement, e.g. How many 3-minute intervals are there in 12 minutes? Ensure the children use the correct vocabulary. Collect answers and discuss the children's strategies.

Main Teaching

Objectives and Vocabulary	Teaching Activities
Solve a problem by extracting and interpreting data in tables and line graphs, e.g. conversion graphs. VOCABULARY distance table line graph conversion graph equivalent estimate approximate RESOURCES Resource sheet 4.2 Activity sheet 4.2	• Give out Resource sheet 4.2. Ask the children what they think the graph shows. Agree it is a conversion graph for pounds to Indian rupees. Establish why it starts at 0 on both axes. **Q** How many rupees would you get for £1? Agree that the graph shows about 65 rupees to the pound. **Q** How many pounds would you get for 250 rupees? Collect answers and ask for explanations as to how the children used the graph. Ask a series of questions that involve children using the graph to connect between the two currencies. **Q** How many pounds would you get for 250 rupees? Collect the different strategies the children use to convert this amount of money. • Emphasise that a conversion graph gives approximate answers and it is important that the children interpret the scale correctly. With the children correct the conversions for 200, 250 and 300 rupees. Make sure the children have a way of making good approximations and are prepared to annotate the pounds axis and that they can use a ruler to help them. • Give out Activity sheet 4.2. Ask the children to look at the table and to explain what information it contains. **Q** Why are some of the squares blank? Collect answers, agree they represent zero kilometres. Get the children to work through the questions. Correct their responses and discuss their methods. Correct any errors and misunderstandings. Highlight the need for a clear and short explanation and agree on an appropriate form of words. Set the children a range of related test questions that involve the interpretation of tables, bar charts and pie charts.

Plenary

Teaching Activities/Focus Questions

• Discuss some of the questions the children have been engaged in, and correct any errors or misunderstandings. Collect the different types and styles of graphs and charts.

HOMEWORK – Set the children questions.

By the end of the lesson the children should be able to:

- **Interpret a line graph in which intermediate values have meaning.**
- **Contrast the presentation of data in different charts or graphs.**

(Refer to supplement of examples, section 6, page 117.)

Planning sheet	Day Four	Unit 4 *Problem solving 1*	Term: *Summer*	Year Group: *6*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Interpret data in a diagram VOCABULARY represents RESOURCES OHT 4.8	• Show OHT 4.8. **Q** What could this diagram represent? Collect suggestions and remind the children that the diagram has no scale. Explain that it represents outbreaks of food poisoning from a central source X. Suppose the units are 10 m apart. **Q** How far is E from X? Ensure the children can read and interpret the diagram. Repeat asking for other distances from X. • Explain that any outbreak within a zone of 25 miles of X was likely to be infected by X. **Q** How many cases were likely to be infected by X? Correct answers. **Q** If this zone was extended to 35 miles, would this include all cases? • Explain that the diagram is now to represent the cost of travel to town X. The circles represent intervals of £25. **Q** How much does it cost to travel from A to X? Correct answers and repeat.

Main Teaching

Objectives and Vocabulary	Teaching Activities
Find the mode and range of a set of data. Begin to find the median and mean. VOCABULARY mode range median mean RESOURCES Mental mathematics test questions (Unit 1)	• Discuss the children's answers to the questions they did for homework. Correct any errors and misunderstandings. • On a large piece of paper write the following words: range, mode, median, mean. Ask the children to discuss in pairs the meaning of each word. Discuss responses and agree a definition for each; record these on the sheet for display. • Write on a board the numbers: 4, 1, 7, 3, 6, 5, 4, 6, 8, 6, 5 Say they were marks on a test – the **range** is 1 to 8, a range of 7 marks; – the **mode** is 6 marks; – the **median** is the middle number when arranged in order; (1, 3, 4, 4, 5, 5, 6, 6, 6, 7, 8) – the **mean** is the sum of the 11 children's marks (55) divided by 11, 5 marks. • Repeat using the marks of a second group of children: 2, 7, 3, 9, 9, 4, 6, 1, 0, 9. Compare the two groups of children's marks. • Introduce a range of mental mathematics test questions for the children to work on that involve money problems, include one- and two-step questions. Identify the questions for which the children cannot use a calculator and those for which calculators are allowed. Say that in this lesson, they will not be allowed to use a calculator but they will use one on the next lesson. The children are to decide which questions it is necessary for them to use a calculator, which they can do using a written method and which they can do in their heads.

Plenary

Teaching Activities/Focus Questions

• Focus on the questions the children have answered.

Q Which questions could you do in your head?

Ask the children to describe their methods and explain why they chose to do it in their heads.

Q Did you use any jottings?

Look at the questions the children used jottings to answer and any annotations they made to the questions. Remind them that even when they do not know straight away how they might answer a question, annotations and jottings can help.

Q Which questions needed a calculator. Why?

Encourage the children to distinguish between those questions that could be answered using a written method and those for which a calculator was an essential tool. Remind them that they might still use jottings when solving a problem with a calculator. Discuss those questions where there is the instruction 'Show your working, you may get a mark'. Emphasise that when they use a calculator, they need only record the calculations they did, and any jottings they needed to get the answer.

By the end of the lesson the children should be able to:

- **Solve problems involving money; choosing the appropriate question.**
- **Explain and record how the problem was solved.**

(Refer to supplement of examples, section 6, page 85.)

Planning sheet	Day Five	Unit 4 *Problem solving 1*	Term: *Summer*	Year Group: *6*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Use the language associated with probability to discuss events, including those with equally likely outcomes. VOCABULARY likely unlikely impossible certain even chance probability RESOURCES Coloured cubes Container OHT 4.9 Large sheet of paper	• Put coloured cubes in a container, e.g. five red, three green, two blue cubes. Shake the container and on a large sheet of paper write: likely, certain, impossible. **Q** If you were to pick a cube from the bag, what is the most likely colour to be picked? Agree it is red. Ask the children to make statements about the colour of cubes you might pick using the words on the displayed sheet of paper. • Ask the children for other words they might add to the list. Ensure 'equally likely', 'even chance' and 'unlikely' are added. With each word, get children to make a statement about the cubes in the container. **Q** What cubes should we add to the container so that picking each colour is equally likely? Ensure the children understand the idea of equally likely outcomes. • Show OHT 4.9. Explain that it represents a spinner. Ask the children to describe the likelihood of the different outcomes. **Q** Which number is the most likely to occur? Ensure the children can explain their answers. Discuss the explanations and record agreed explanations on the board. Keep adding new words to the display.

Main Teaching

Objectives and Vocabulary	Teaching Activities
Review the week's work and address the objectives set out on the front page. RESOURCES Calculator Timer Mental mathematics Test questions	• Give out calculators and continue with the problems introduced at the end of the previous lesson. • Correct the children's responses and discuss their recordings, strategies and use of the calculators when answering the questions. • Introduce a new set of six questions, three non-calculator questions, three calculator questions. Give children a fixed time to answer the three non-calculator questions. Discuss their answers and methods. Explain how the marks are awarded to help the children to identify any errors or omissions they might have made that resulted in lost marks. • Repeat with the three calculator questions.

Plenary

Teaching Activities/Focus Questions

• Review the displays from the week's work. Identify the key points and remind the children of the problem-solving skills they have been using this week. Emphasise the need to read a question carefully and not to be reluctant to annotate the question or diagram and jot down what they think will help them answer the question.

• Give the children time to identify what they can do and what they still need to concentrate on. Collect responses and highlight any particular areas that still need attention.

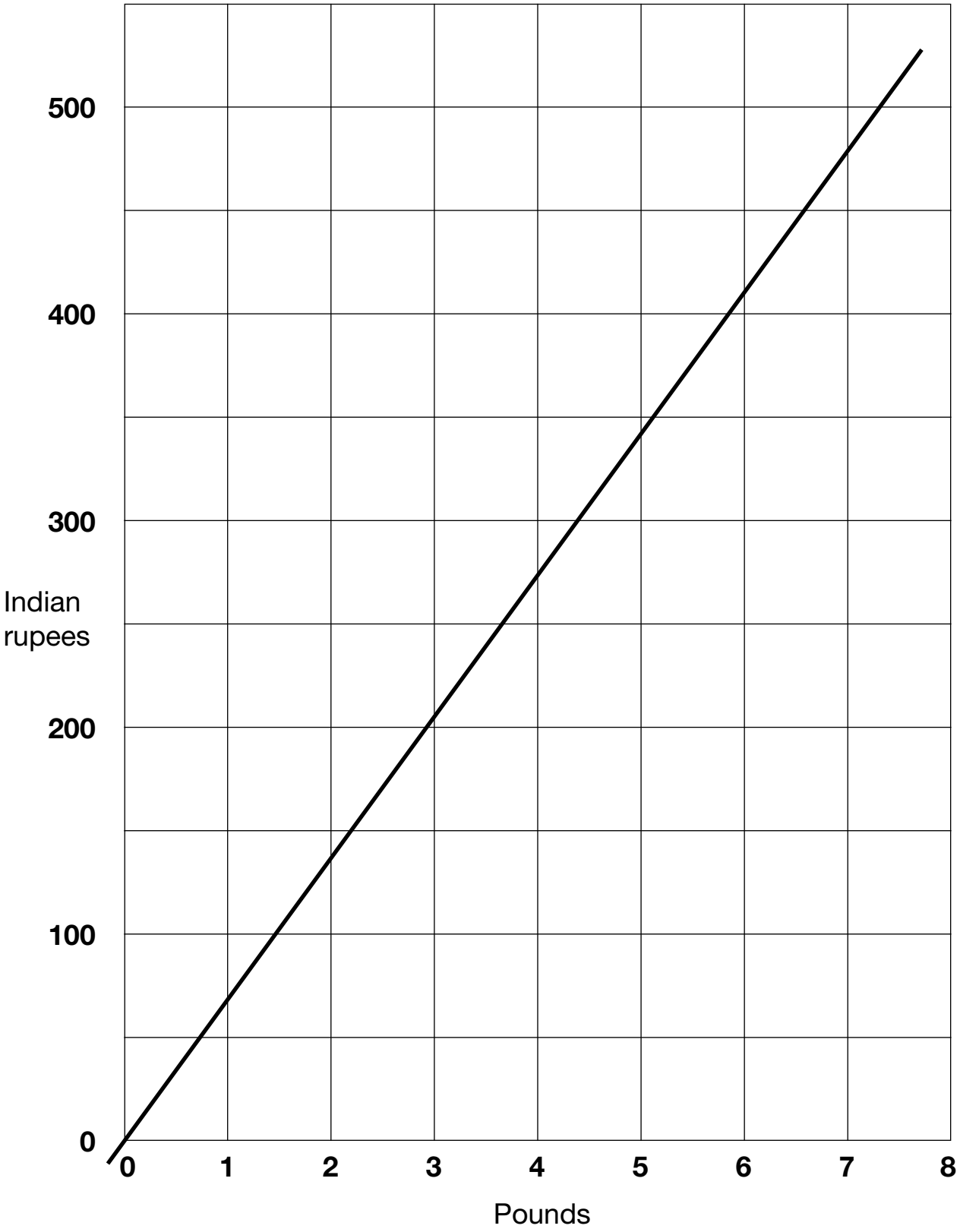
• End the lesson with some 5-second questions to emphasise what the children can do quickly and successfully.

By the end of the lesson the children should be able to:

- **Recognise what aspects of mathematics they still need to pay attention to.**

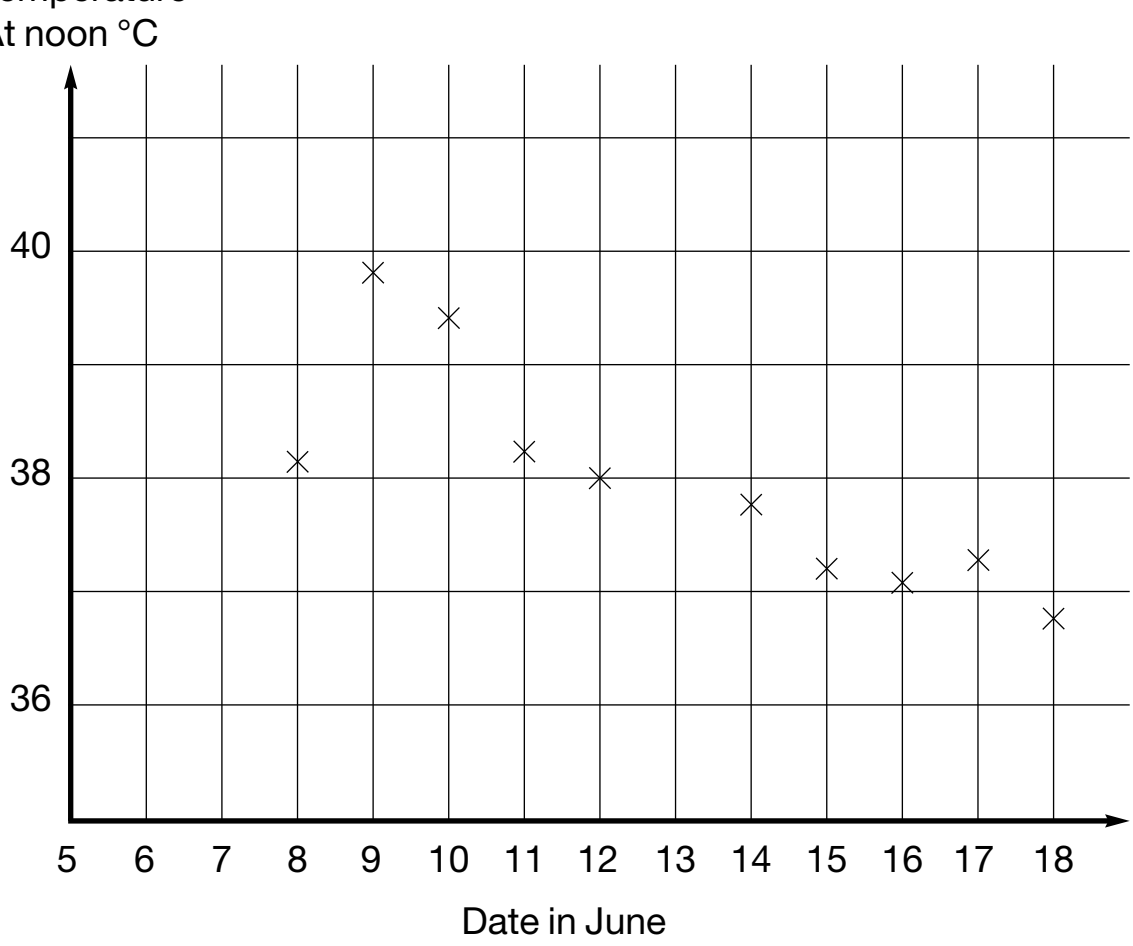
Points Table

Standing long jump	
80 cm or over	1 point
100 cm or over	2 points
120 cm or over	3 points
140 cm or over	4 points
160 cm or over	5 points
180 cm or over	6 points
200 cm or over	8 points


500
400
300
Indian rupees
200
100
0
0
1
2
3
4
5
6
7
8
Pounds

Dave was ill in June.

This is his temperature chart.



1. For how many days was his temperature marked as **more than 37°C**?

1 mark

2. Which **date** showed the largest **change in temperature** from the day before?

1 mark

3. Estimate Dave's **highest** temperature shown on the graph.
Give your answer to **one decimal place**

1 mark

4. When was Dave's temperature 38°C?

1 mark

5. Explain why the doctor thinks Dave is recovering on 16th June.

This table shows the distances in **kilometres** between five cities.

	Birmingham	Cardiff	London	Manchester	Newcastle
Birmingham		179	188	127	334
Cardiff	179		269	278	489
London	188	269		298	441
Manchester	127	278	298		212
Newcastle	334	489	441	212	

1. What is the distance from **London** to **Manchester**?

 1 mark

2. James travels from **Newcastle** to **Birmingham**, and then on to **Cardiff.** How many kilometres does he travel?

 1 mark

3. Which two cities are **278 kms** apart ?

 1 mark

4. How much further is it to travel from **London** to **Manchester** than from **Manchester** to **Cardiff**?

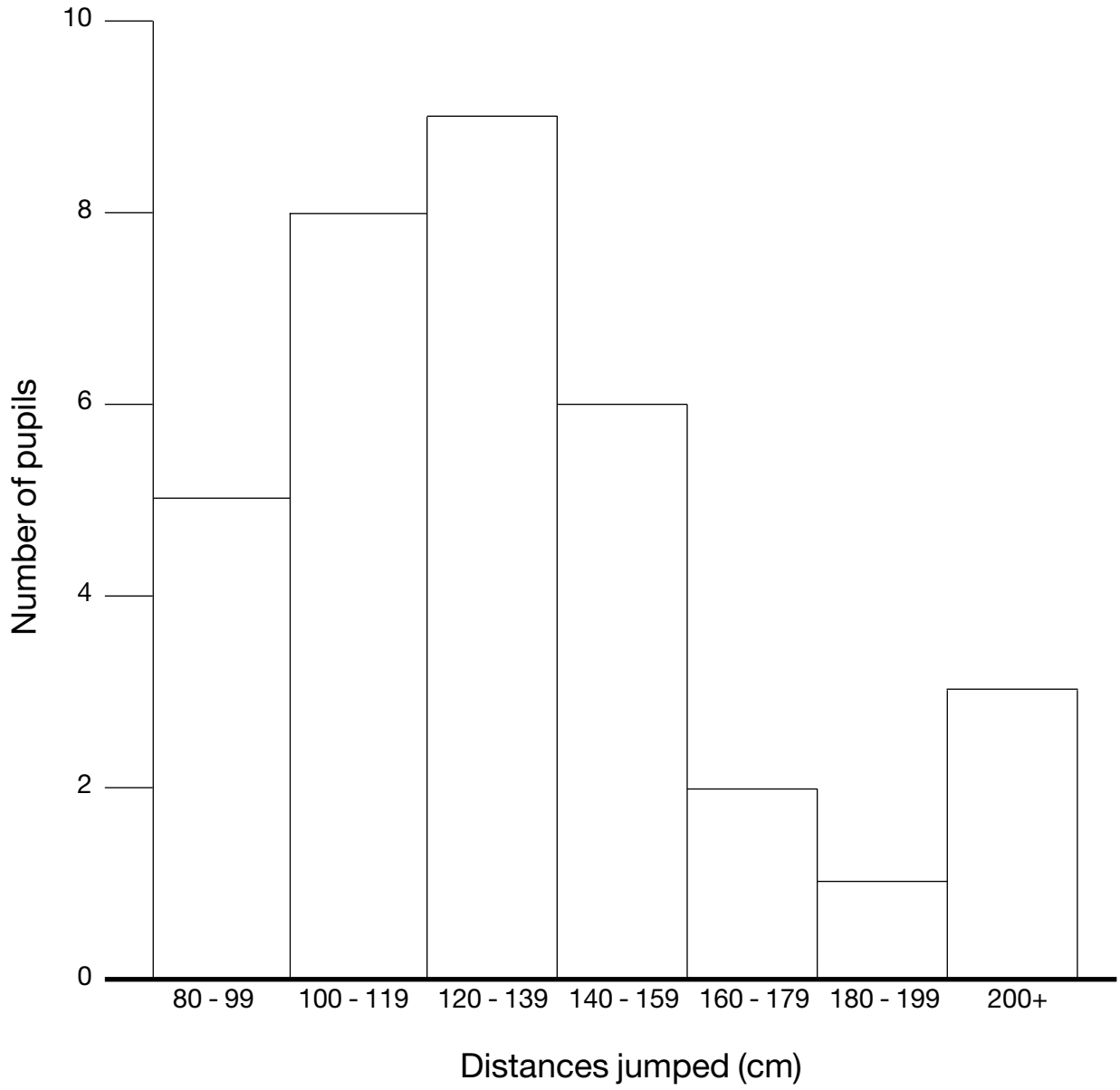
 1 mark

5. Lucy lives in Manchester. She plans to travel to Birmingham then Cardiff and return to Manchester. She says it should be less then 500 km. Is she right? **Yes/No**

Explain your answer.

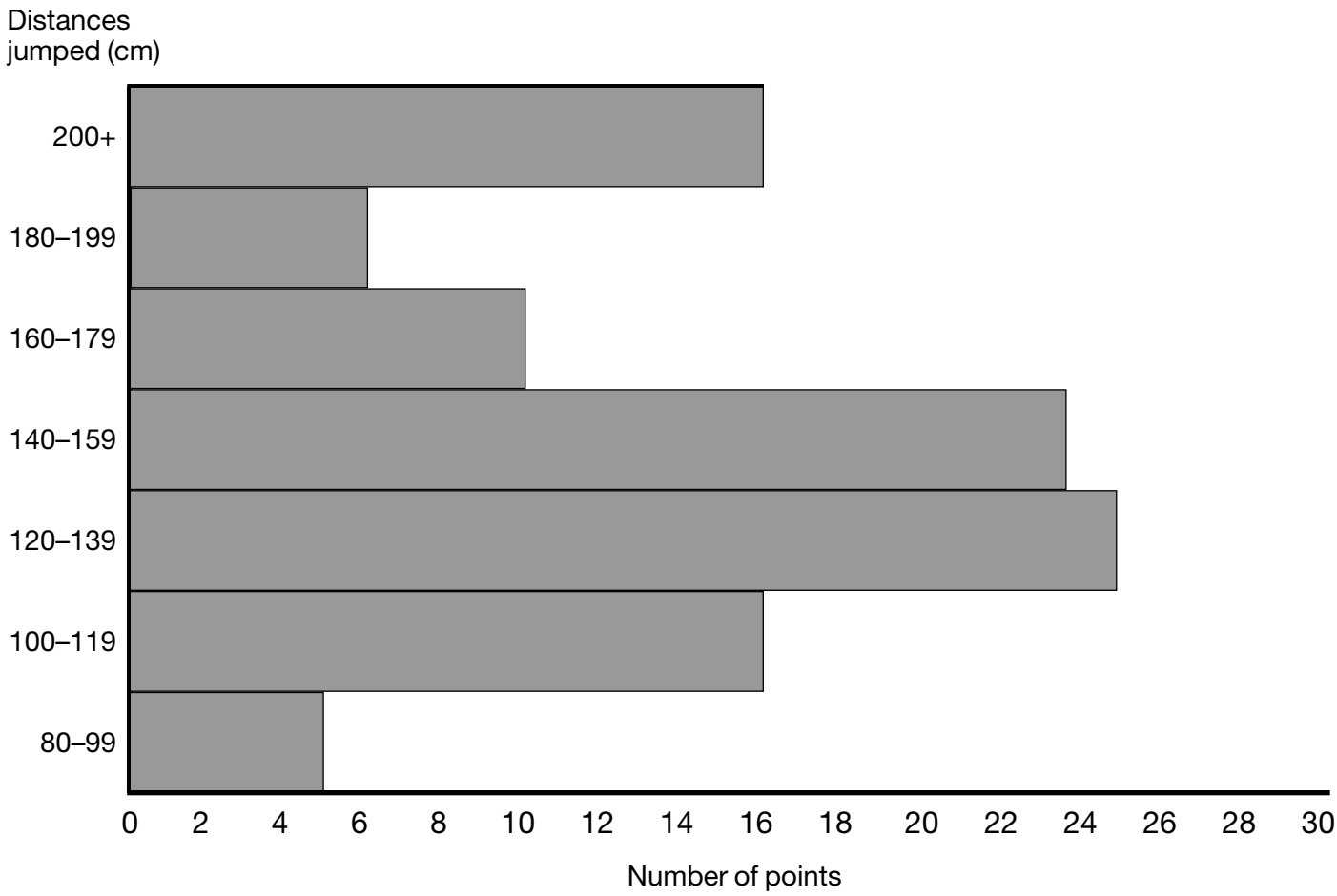
1 mark

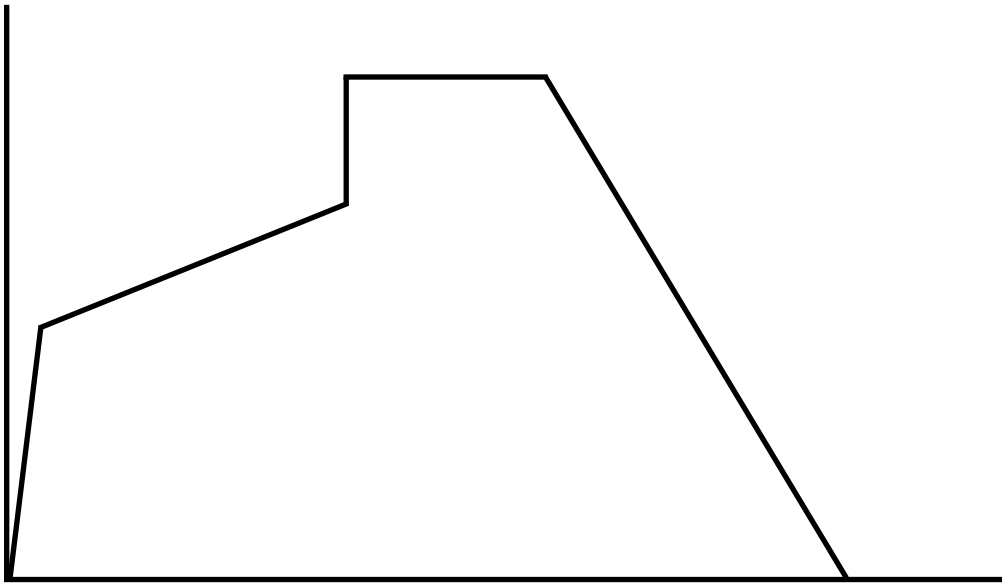
Distances Achieved in Standing Long Jump

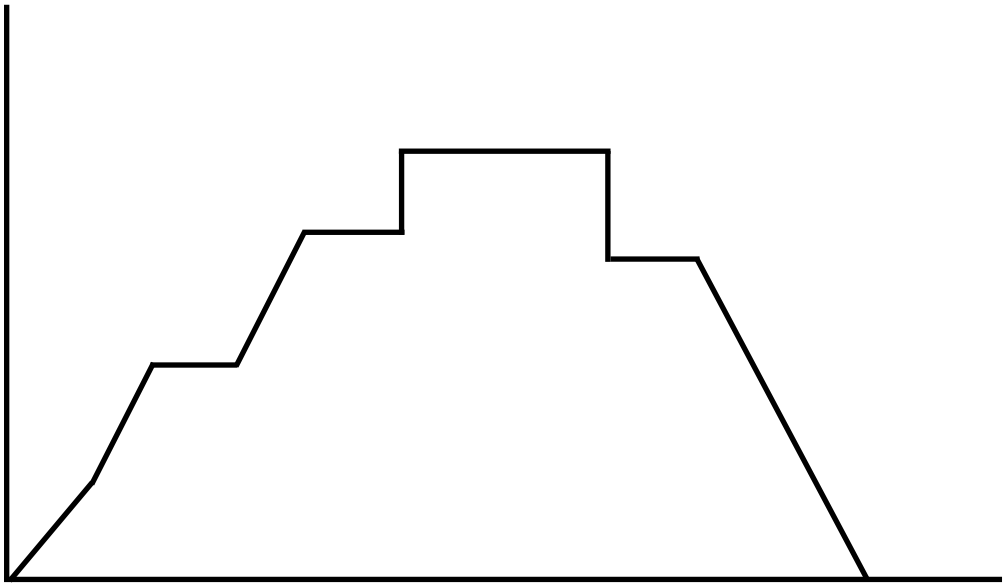


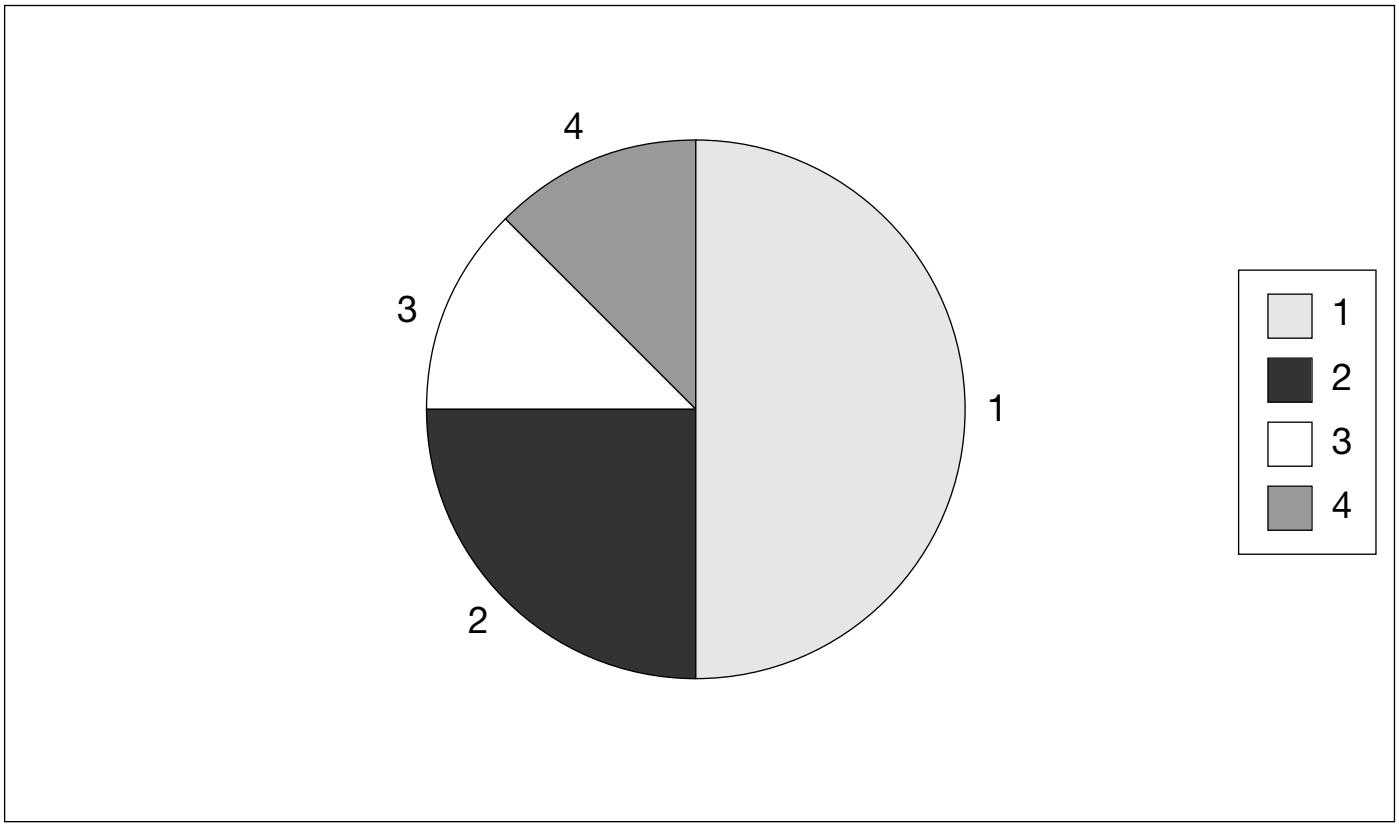
Car Park Charges	
Time	**Charge**
up to 1 hour	20p
1 to 2 hours	50p
2 to 3 hours	£1.00
3 to 4 hours	£1.70
over 4 hours	£5.00

Points Scored in Standing Long Jump

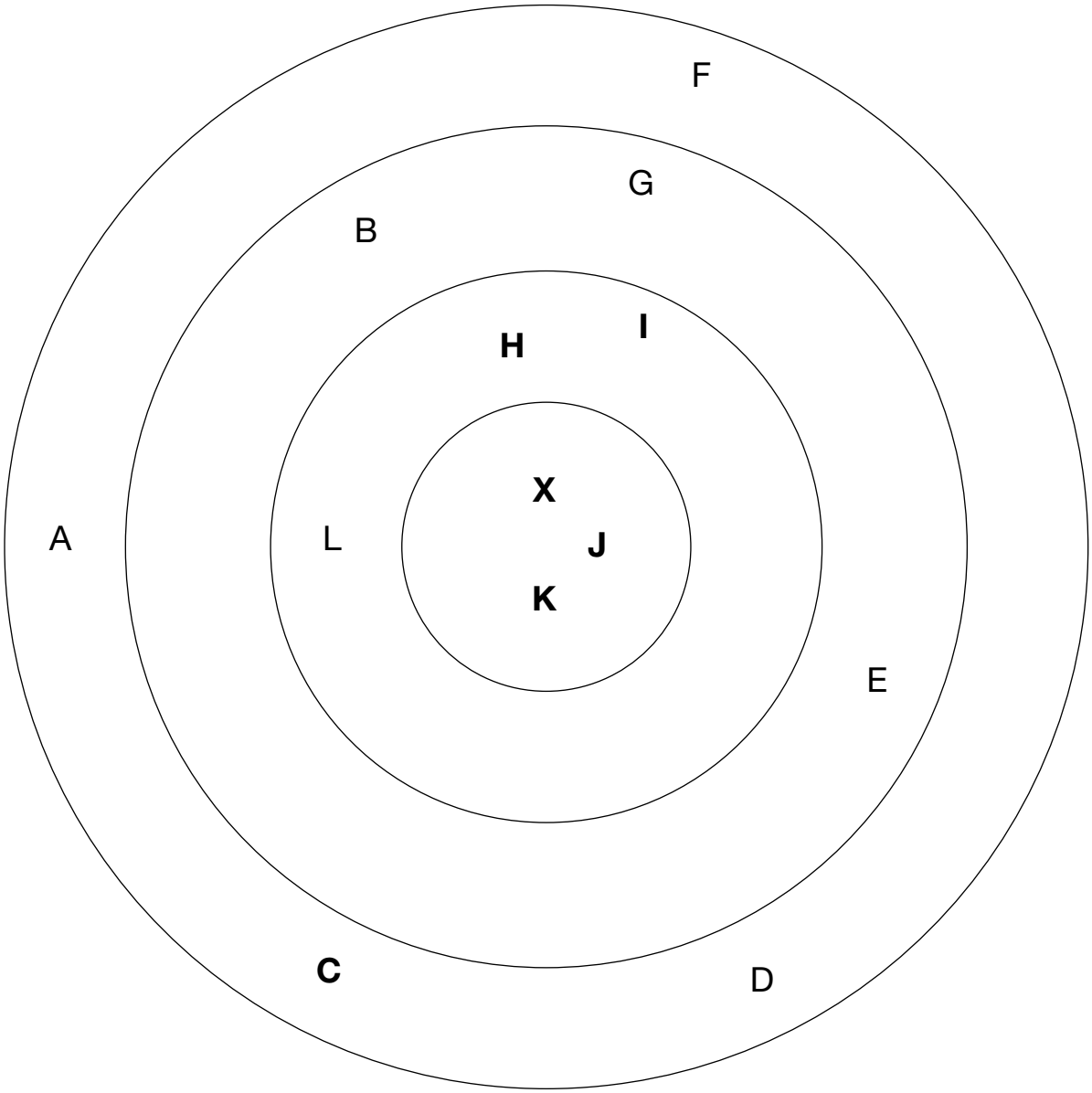







4
3
1
2
1
2
3
4

×	4	5	6	7	8	9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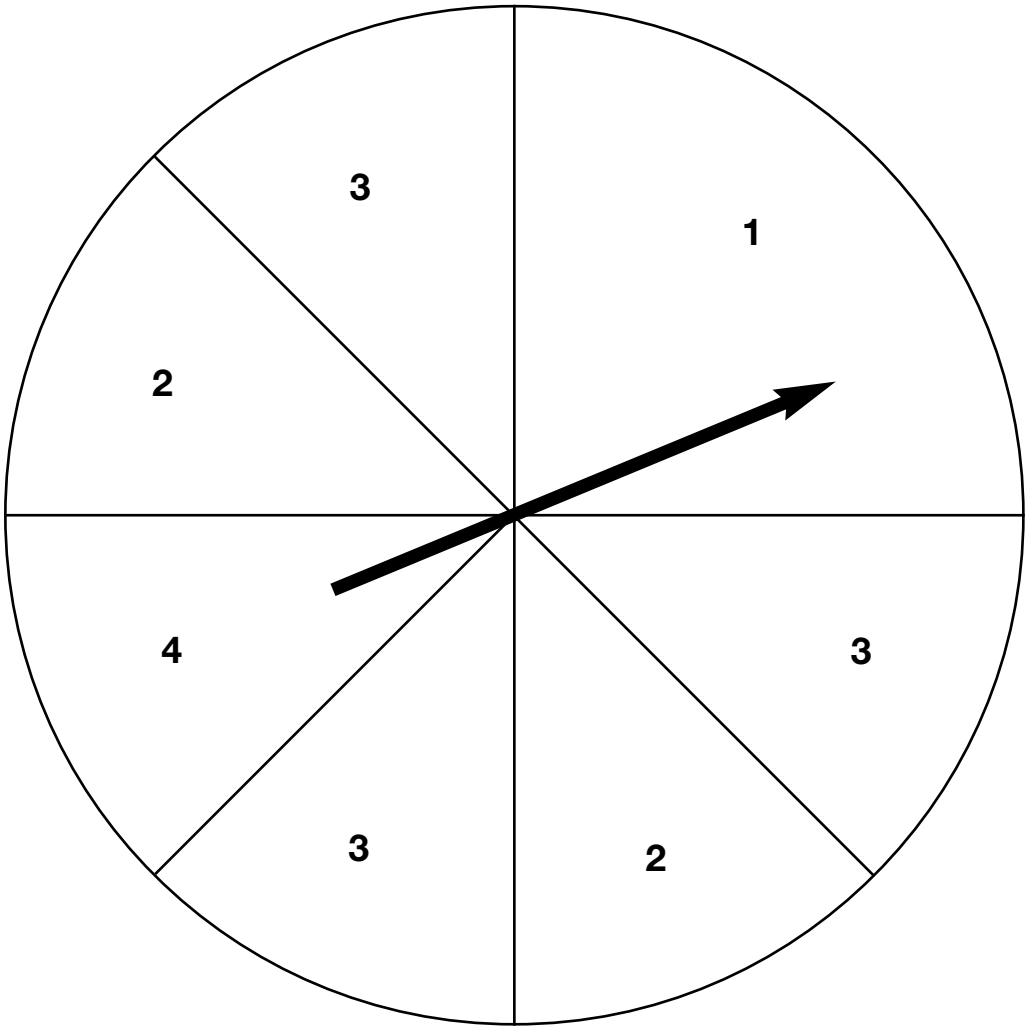
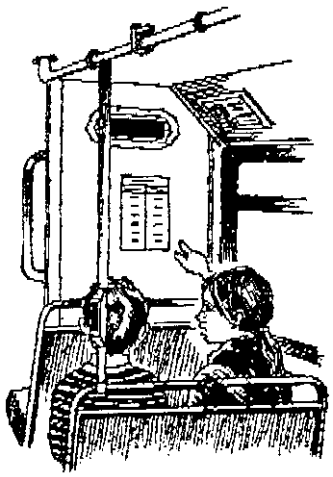

3
1
2
4
3
3
2

Related Key Stage 2 National test questions:

2001 Test A

3 This table shows the increase in bus fares.

Bus Fares	
old fare	**new fare**
42p	48p
52p	57p
60p	72p
75p	85p
90p	£1.05
£1.20	£1.28



Sohan's **new** bus fare is **72p**.

How much has his bus fare gone up?

 p

3

1 mark

Millie says,

'My bus fare has gone up by 10p'.

How much is Millie's new bus fare?

 p

3

1 mark

Total

2001 Test A cont.

14

Book Sale
Any 3 books for £14.50

Lee bought **these three** books in the sale for **£14.50**

How much money did he save altogether compared to the **full price** of the books?

Show your **working.** You may get a mark.

£

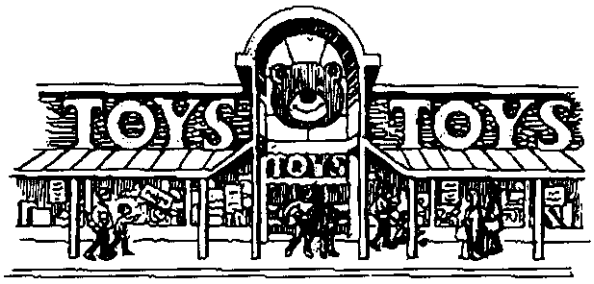
14

2 marks

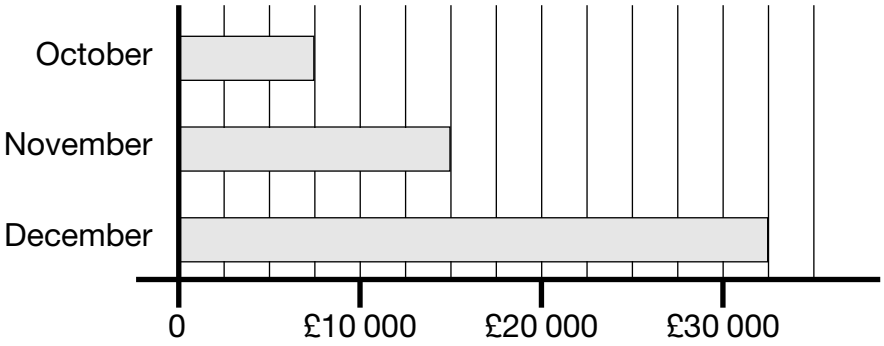
Total

2001 Test A cont.

22



This chart shows the amount of money spent in a toy shop in three months.



How much more money was spent in the shop in **December** than in **November**?

£

22

1 mark

Stefan says,

'In November there was a 100% increase on the money spent in October'.

Is he correct?
Circle Yes or No.

Yes / No

Explain how you can tell from the chart.

22

1 mark

Total

2001 Test B

10

This is the cost to visit the waxworks.

Adults	£8.50
Children	£4.50

On Friday morning **12 adults** and **20 children** visit the waxworks.

How much do they pay altogether?

Show your **method.** You may get a mark.

£

10

2 marks

Guide books cost **£1.50** each.

The waxworks sells **£24** worth of **guide books**.

How many guide books is this?

10

1 mark

Total

2001 Test B cont.

13 Write these numbers in the correct places on the Venn diagram.

Some numbers are already placed.

99 **170** **221**

13

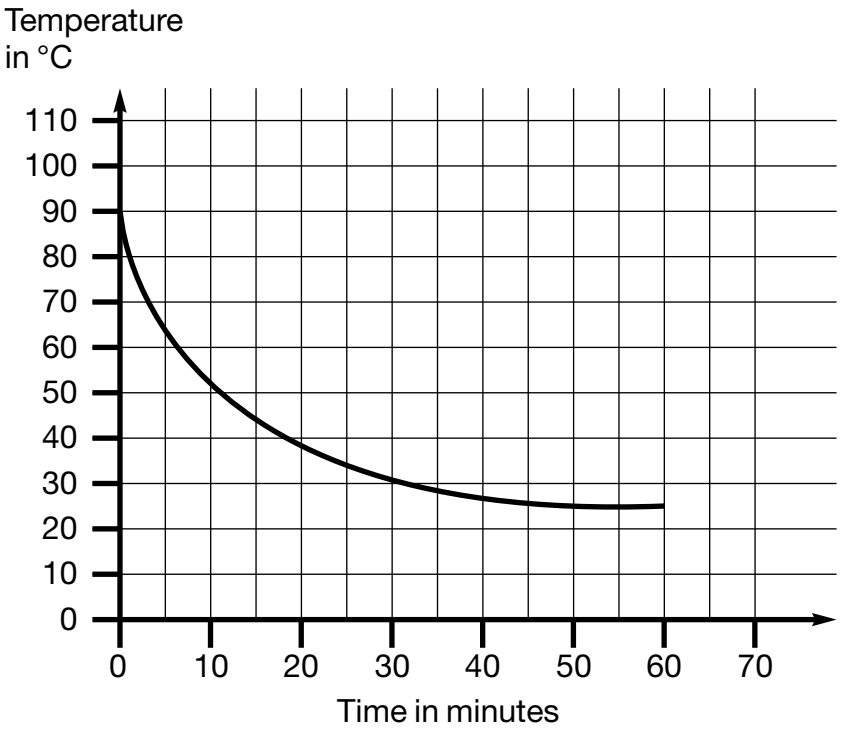
2 marks

Total

2001 Test B cont.

25 A hot liquid is left to cool in a science experiment.

This graph shows how the temperature of the liquid changes as it cools.



Read from the graph **how many minutes** it takes for the temperature to reach **40°C.**

minutes

25

1 mark

Read from the graph **how many minutes** the temperature is **above 60°C.**

minutes

25

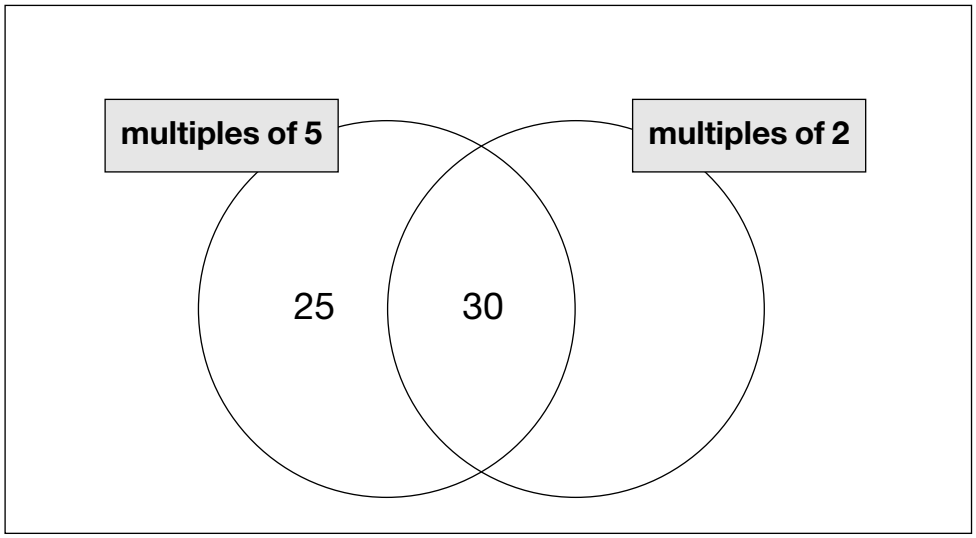
1 mark

Total

2000 Test A

4 Write **each** of these numbers in its correct place on the sorting diagram.

40 **8** **15**



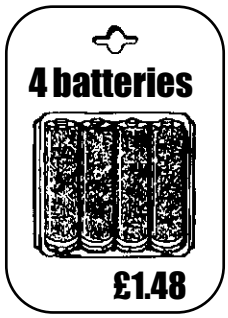
4

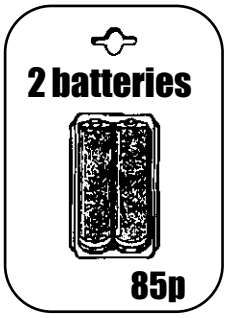
2 marks

Total

2000 Test A cont.

6 A shop sells batteries in **packs of four** and **packs of two**.





Simon and Nick want two batteries each.
They buy a **pack of four** and share the cost equally.

How much does each pay?

Show your **working.** You may get a mark.

£

6

2 marks

Mary buys **2 packs of two** batteries. Hamid buys **1 pack of four**.

How much **more** does Mary pay than Hamid?

Show your **working.** You may get a mark.

£

6

2 marks

Total

2000 Test A cont.

7

This table shows the numbers of children who went walking, sailing or climbing at an outdoor centre.

	May	**June**	**July**
walking	25	80	75
sailing	15	42	50
climbing	18	27	23

How many children went **sailing** in **May**, **June** and **July** altogether?

7

1 mark

How many **more** children went **walking** in **June** than **climbing** in **June**?

7

1 mark

Total

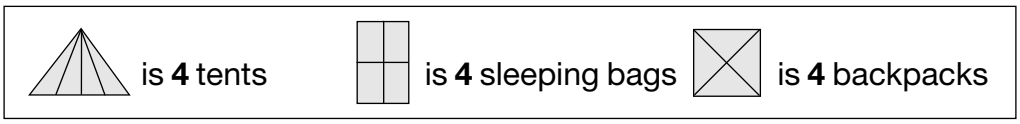
2000 Test A cont.

10

A camping shop sells **tents**, **sleeping bags** and **backpacks**.

This chart shows how many of each they sold in June.

Items sold in June



tents	
sleeping bags	
backpacks	

The shop had **20** sleeping bags at the **beginning of June**.

How many of these sleeping bags did the shop have left at the **end of June**?

10

1 mark

In **July**, the shop sold **three times as many** tents as in June.

How many tents did the shop sell in **July**?

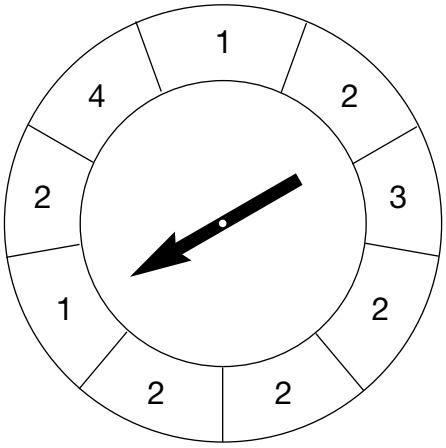
10

1 mark

Total

2000 Test A cont.

14 The spinner is divided into **nine** equal sections.



Which **two different numbers** on the spinner are equally likely to come up?

✎ **and**

14

1 mark

Meera says,

'2 has a greater than even chance of coming up'.

Explain why she is correct.

✎ _____

_____

_____

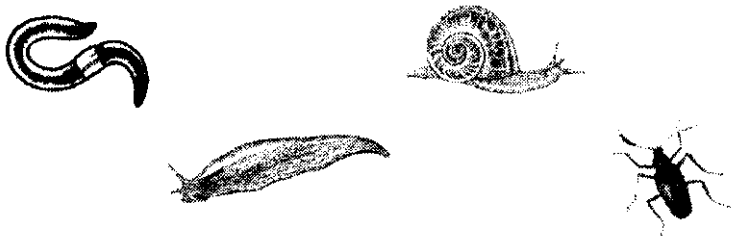
14

1 mark

Total

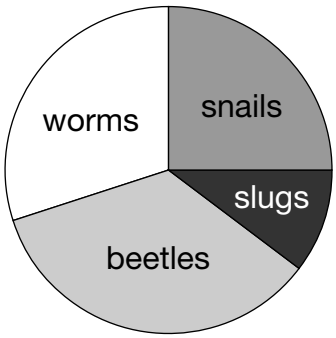
2000 Test A cont.

17 Tony and Gemma looked for snails, worms, slugs and beetles in their gardens.



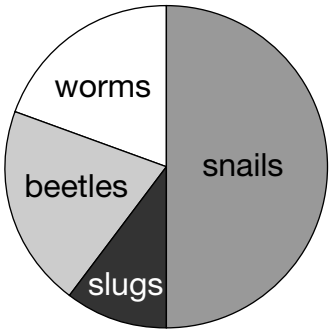
They each made a pie chart of what they found.

Tony's pie chart



Total 80

Gemma's pie chart



Total 36

Estimate the number of **worms** that **Tony** found.

17

1 mark

Who found more **snails**?
Circle Tony or Gemma.

Tony / Gemma

Explain how you know.

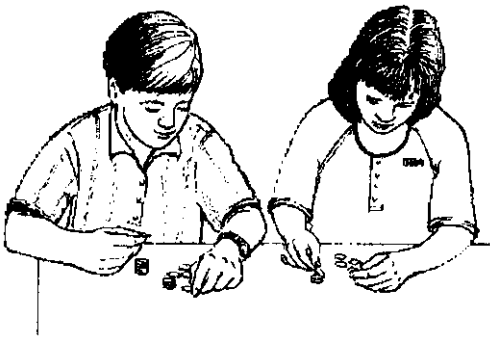
17

1 mark

Total

2000 Test B

9



Chris saves **50p** coins.

He has saved **45** of them.

How much money has Chris saved?

9

1 mark

Michelle has saved **£8.40** in **20p** coins.

How many **20p coins** does Michelle have?

Show your **method.** You may get a mark.

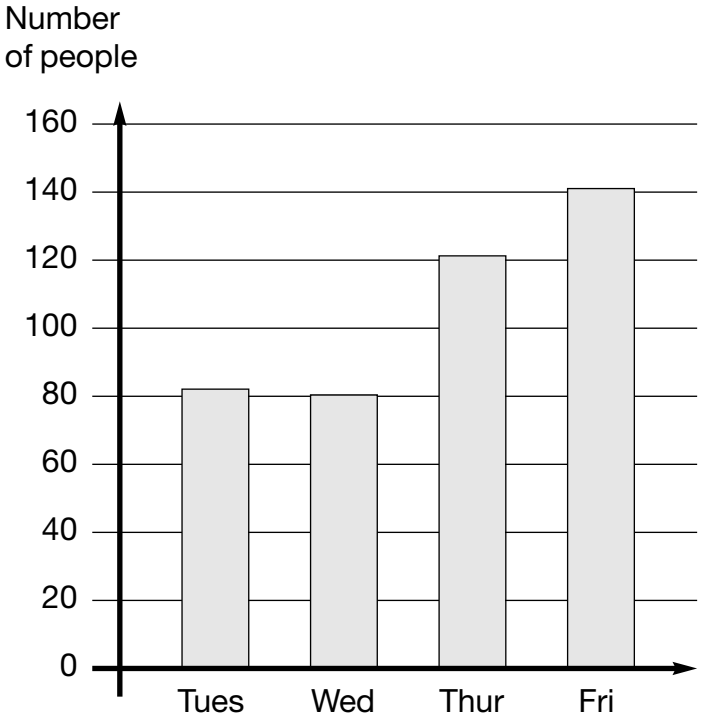
9

2 marks

Total

2000 Test B cont.

10 This bar chart shows how many people went to a school play.



Estimate the number of people who went there on **Thursday** and **Friday** altogether.

10

1 mark

Each person paid **£2.25** for a ticket to get in.

How much **ticket money** was collected on **Wednesday**?

Show your **method.** You may get a mark.

10

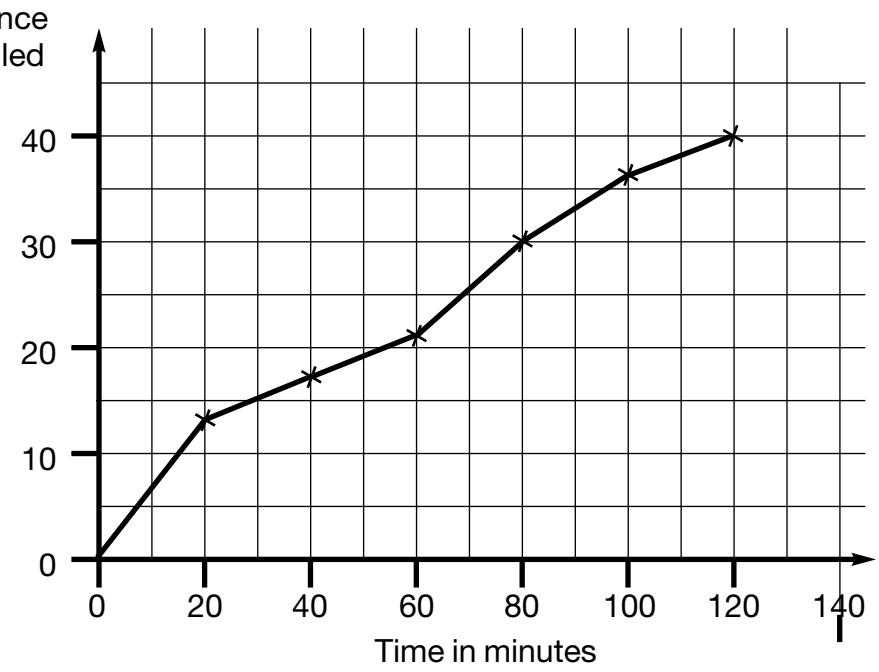
2 marks

Total

2000 Test B cont.

19 Carol went on a **40-kilometre** cycle ride.

This is a graph of how far she had gone at different times.



How many minutes did Carol take to travel the **last 10 kilometres** of the ride?

minutes

19

1 mark

Use the graph to estimate the distance travelled in the **first 20 minutes** of the ride.

km

19

1 mark

Carol says,

'I travelled further in the first hour then in the second hour'.

Explain how the graph shows this.

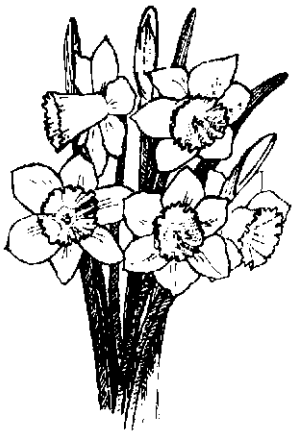
19

1 mark

Total

1999 Test A

7 A shop sells flowers.



Daffodils 99p for a bunch	**Roses** 40p each

John buys 3 bunches of daffodils.

How much does he pay altogether?

7

1 mark

Karpal has **£4.00** to spend on **roses**.

How many **roses** can she buy for **£4.00**?

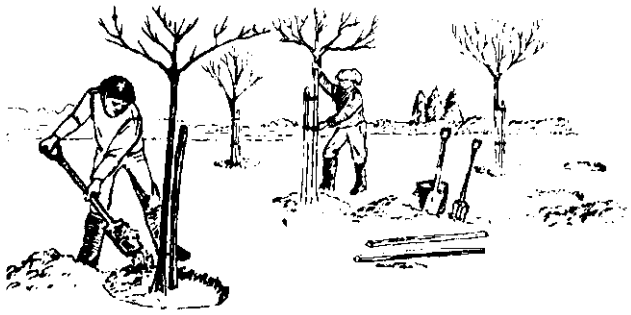
7

1 mark

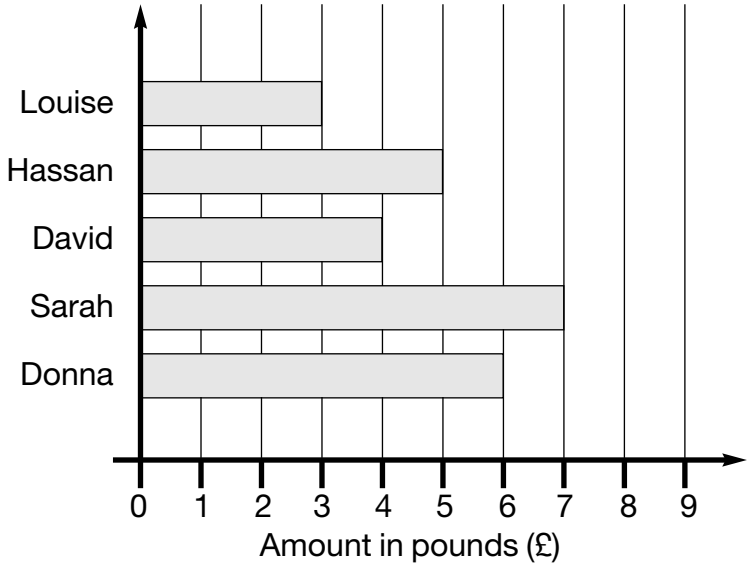
Total

1999 Test A cont.

10 Five children collect money to plant trees.



Here is a bar chart of the amounts they have raised so far.



Their target is **£40 altogether**.

How much **more** money do they need to reach the target?

Show your **working.** You may get a mark.

£

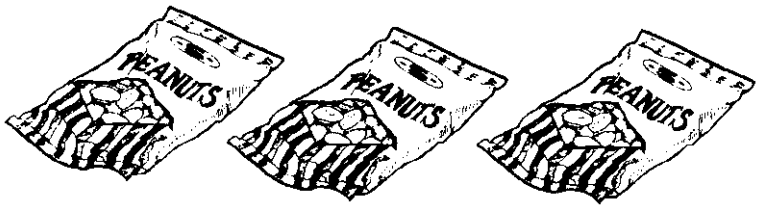
10

2 marks

Total

1999 Test A cont.

11 Parveen buys 3 small bags of peanuts.



She gives the shopkeeper £2 and gets 80p change.

What is the cost in pence of one bag of peanuts?

Show your **working.** You may get a mark.

p

11

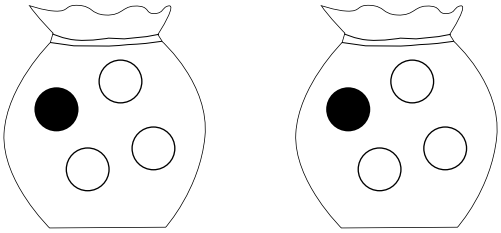
2 marks

Total

1999 Test A cont.

15 Here are two bags.

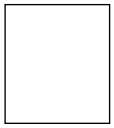
Each bag has **3 white balls** and **one black ball** in it.



A ball is taken from **one of the bags** without looking.

What is the probability that it is a **black ball**?

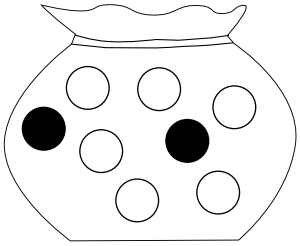
Give your answer as a fraction.



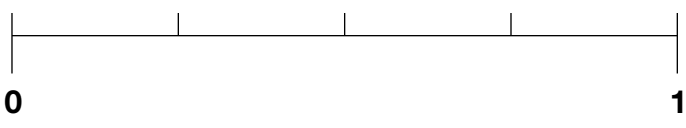
15

1 mark

All the balls from **both bags** are now mixed together in a new bag.



Put a **cross (x)** on this line to show the probability of taking a **black ball** from the new bag.



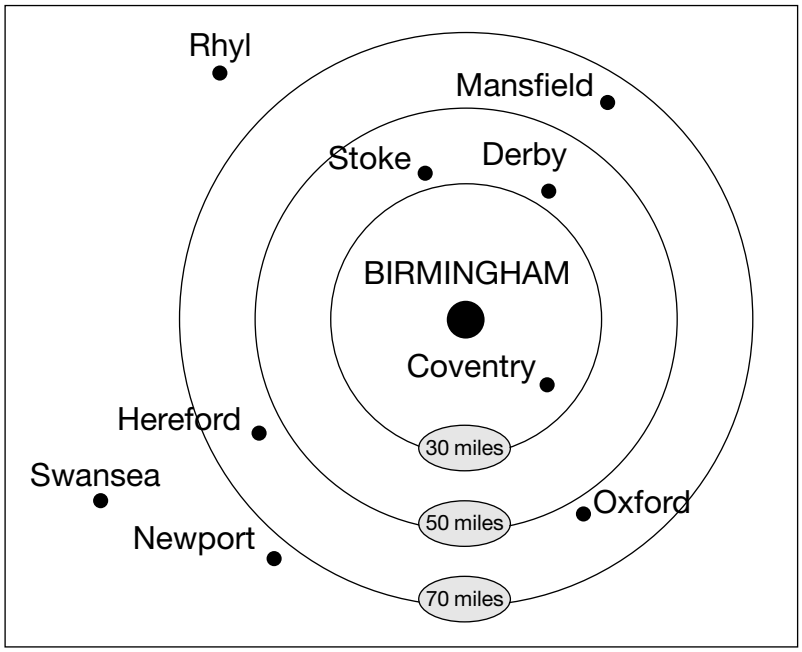
15

1 mark

Total

1999 Test B

10 This diagram shows the distances of different towns from Birmingham.



Write the name of a town which is **between 30 and 50 miles** from Birmingham.

.....

10

1 mark

Use the diagram to estimate the distance in **miles** from **Birmingham** to **Mansfield**.

miles

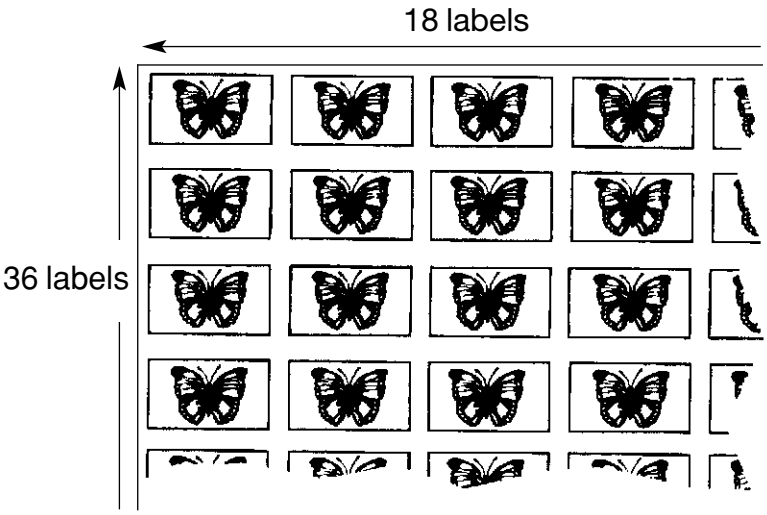
10

1 mark

Total

1999 Test B cont.

16 A shop sells sheets of sticky labels.
On each sheet there are **36 rows** and **18 columns** of labels.



How many labels are there altogether on **45 sheets**?

Show your **method.** You may get a mark.

16

2 marks

Total

1998 Test A

4 Three children start with **50p** each.

Charlie Susan Pete

Charlie gives Susan **15p**.

How much do **Charlie** and **Susan** each have now?

 p Charlie p Susan

4

1 mark

Peter gives **half** of his 50p to Susan.

How much does **Peter** have left?

 p Peter

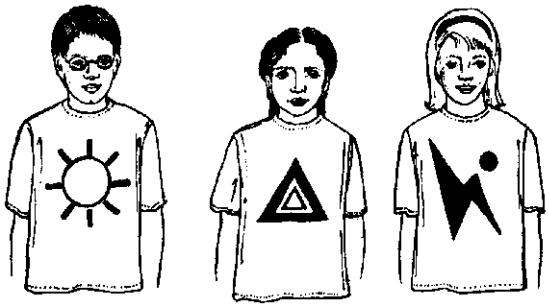
4

1 mark

Total

1998 Test A cont.

5 Patterns are printed on T-shirts.



A shop sells 3 sizes of T-shirt, **small**, **medium** and **large**.

The table shows the number of T-shirts sold in one week.

T-shirts sold in one week			
	Pattern		
Sizes	☼	▲	⚡
small	8	17	15
medium	11	14	9
large	14	5	8

How many **medium** T-shirts are sold in the week?

5

1 mark

How many T-shirts with ⚡ on them are sold in the week?

5

1 mark

Total

1998 Test A cont.

7

Some children go camping.
It costs **£2.20** for each child to camp each night.
They go for **6** nights.

How much will **each child** have to pay for the **6** nights?

Show your **working.** You may get a mark.

£

7

2 marks

There are **70** children.
Each tent takes up to **6** children.

What is the **least number of tents** they will need?

Show your **working.** You may get a mark.

tents

7

2 marks

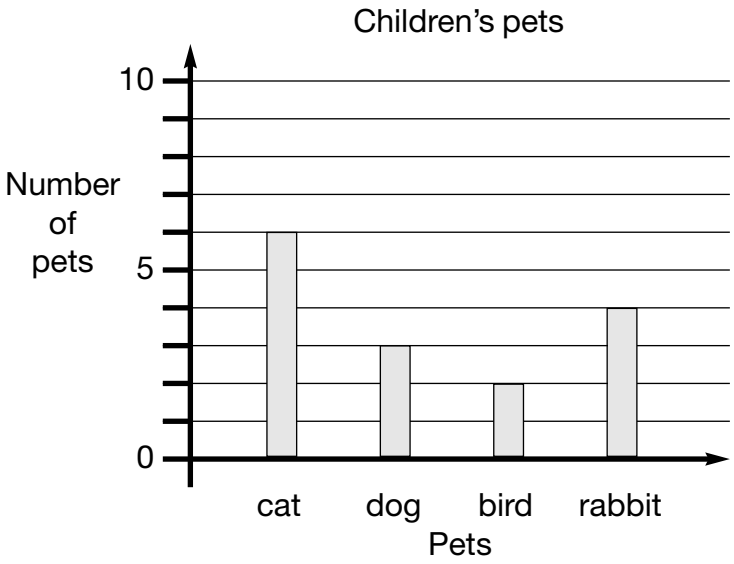
Total

1998 Test A cont.

13 Here is a table of the pets owned by **six** children.

Name of child	Cat	Dog	Bird	Rabbit
David	3	1	0	0
Julie	0	0	1	2
Carl	2	0	0	1
Terry	0	1	0	1
Mary	0	2	0	0
Hawa	1	0	1	1

Here is a graph of the pets of **five** of the children.



The pets of **one** of the children are not on the graph.

Whose pets are **not** on the graph? .....

Explain how you know.

13

1 mark

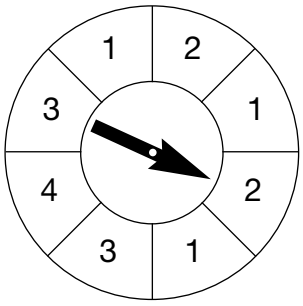
13

1 mark

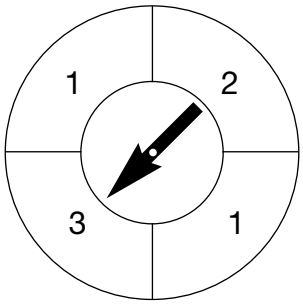
Total

1998 Test A cont.

17 Lee has two spinners.



A



B

What is the probability of spinning a **4** on **spinner A**?

Write your answer as a fraction.

17

1 mark

On which spinner is he **more likely** to get a **1**?

Give a reason for your answer.

17

1 mark

Lee says,

'I am equally likely to get a 2 on spinner A as on spinner B'.

Explain why he is correct.

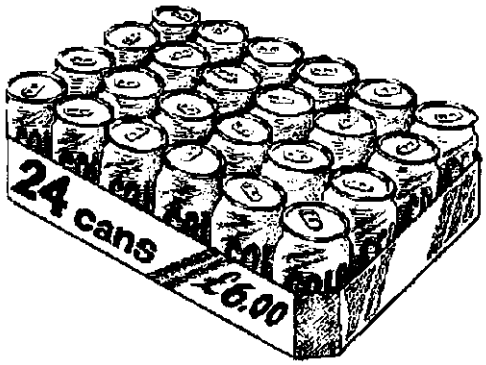
17

1 mark

Total

1998 Test A cont.

18 Shenaz buys a pack of **24 cans** of cola for **£6.00**



What is the cost of **each can**?

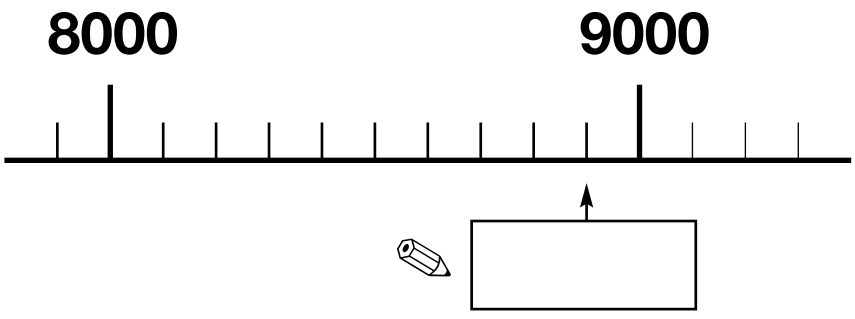
Show your **working.** You may get a mark.

18

2 marks

9 Here is part of a number line.

Write in the number indicated by the arrow.



9

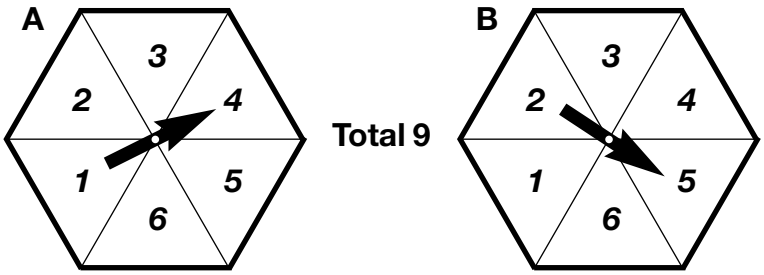
1 mark

Total

1998 Test B

11 Megan spins the pointers on these two spinners.

She adds the numbers together to make a **total**.



Here is a table to show all the possible totals.

Number on Spinner B

Number on Spinner A	***1***	***2***	***3***	***4***	***5***	***6***
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Use the table to answer these questions.

What is the **most likely** total?

11

1 mark

What is the **probability** of getting a total of **1**?

11

1 mark

The **total 3** and the **total 11** are **equally likely**.

Explain how the table shows this.

11

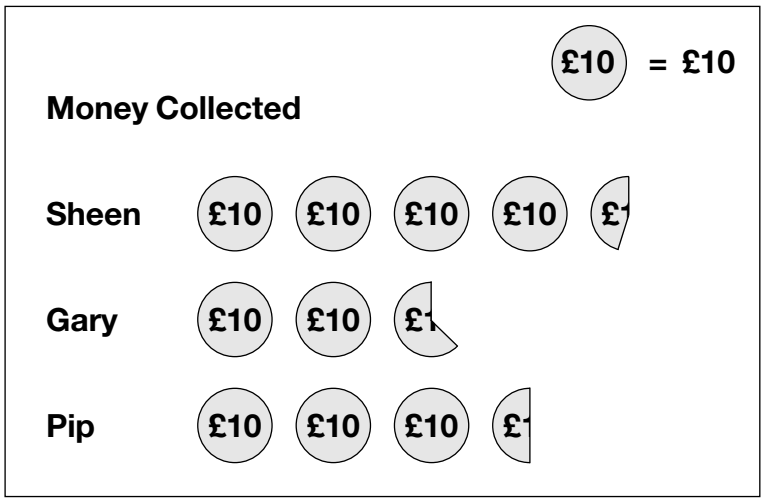
1 mark

Total

1998 Test B cont.

14 Three children do a sponsored silence.

This is a chart of the money they collected.



Estimate how much **Sheena** collected.

£ 14

1 mark

Together **Gary** and **Pip** collected **more than £60**.

Explain how the **chart** shows this.

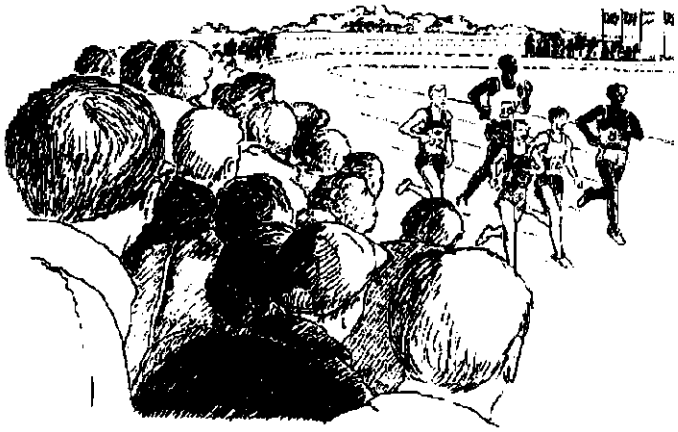
14

1 mark

Total

1998 Test B cont.

19



2753 people go to a sports event.

Each person pays **£2.30** for a ticket.

What is the **total** amount of **ticket money** collected?

£

19

1 mark

Programmes cost **65p** each.

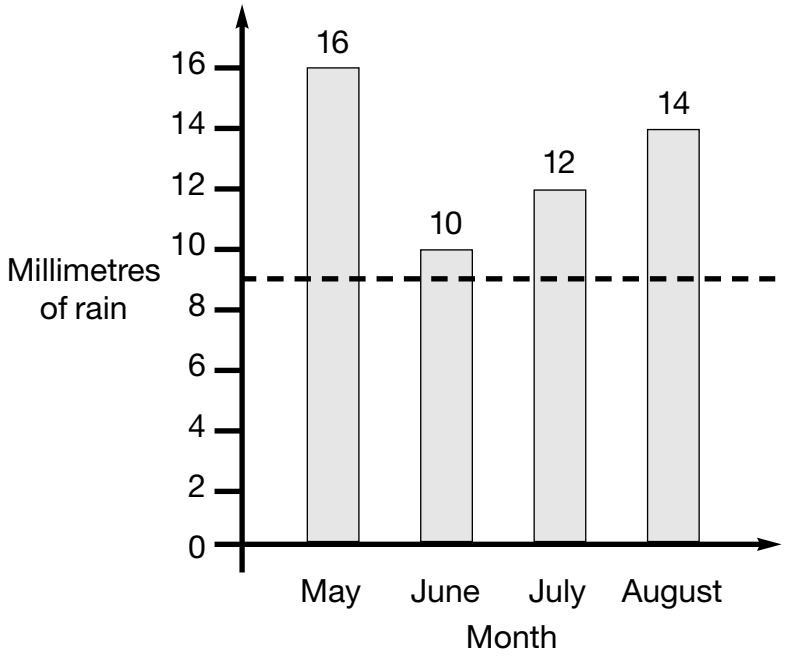
The total money from programme sales is **£612.95**

How many programmes are sold?

Total

1998 Test B cont.

21 Here is a bar chart showing rainfall.



Kim draws a dotted line on the bar chart.

She says,

'The dotted line on the chart shows the mean rainfall for the four months.'

Use the chart to explain why Kim **cannot** be correct.

_____

_____

_____

21

1 mark

What is the **mean** rainfall for the four months?

mm

21

1 mark

Total

1997 Test A

7 Jack buys **one jar** of **cherry jam for 82p**.

He pays with a **£5** note.

How much **change** does he get?

Show your **working.** You may get a mark.

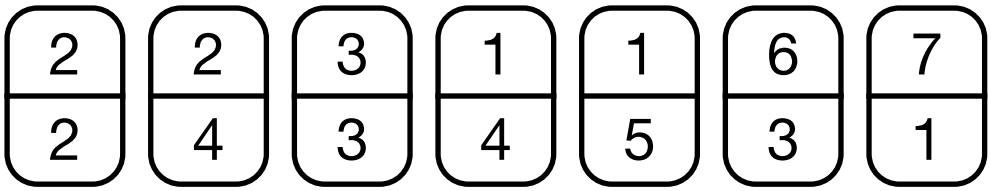
7

2 marks

Total

1997 Test A cont.

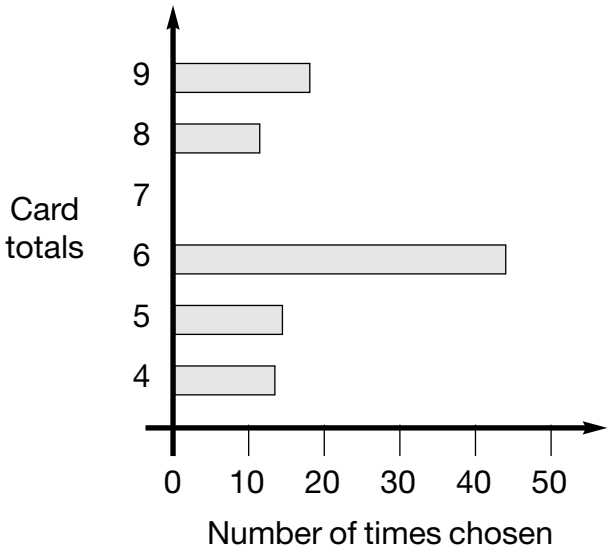
14 **Seven** number cards are in a bag.



Jill takes one card out and finds the total of the two numbers.
She then puts the card back in the bag.

This is a graph of Jill's results after doing this **100 times**.

Graph of totals of 100 choices



Give the reason why the **'total 7' never** came up.

Give the reason why the **'total 6'** came up **most often**.

14

1 mark

14

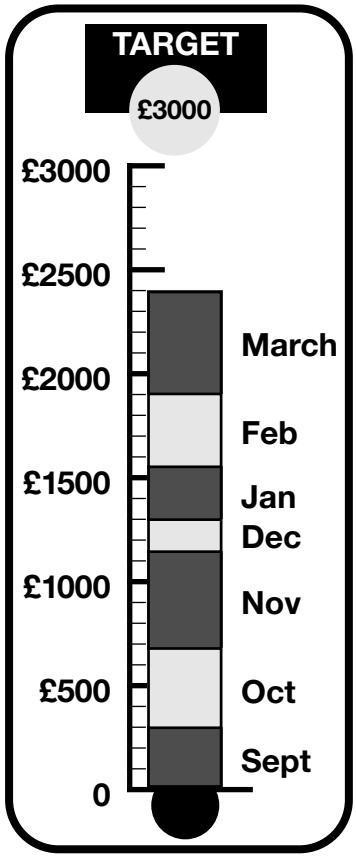
1 mark

Total

1997 Test A cont.

19 A school collects money for charity.

This chart shows how much has been collected.



The target is **£3000**.

Estimate how much **more** money the school needs to reach the target.

£ 19

1 mark

Anil says,

'The chart shows that we will reach the target in two months'.

Use the chart to explain why Anil may be wrong.

19

1 mark

Total

1997 Test B

6 Lynne wants to raise **£100** by running laps.

She is sponsored for **£6.50** for each lap.

What is the **least** number of **whole laps** she must do?

6

1 mark

12 This table shows the distances in **kilometres** between five towns.

	Birmingham	Cardiff	London	Manchester	Newcastle
Birmingham		179	188	127	334
Cardiff	179		269	278	489
London	188	269		298	441
Manchester	127	278	298		212
Newcastle	334	489	441	212	

Use the table to find the distance from **London** to **Manchester**.

km

12

1 mark

James goes from **Newcastle** to **Birmingham**, and then on to **Cardiff**.
How many **kilometres** does he travel?

Show your **working.** You may get a mark.

km

12

2 marks

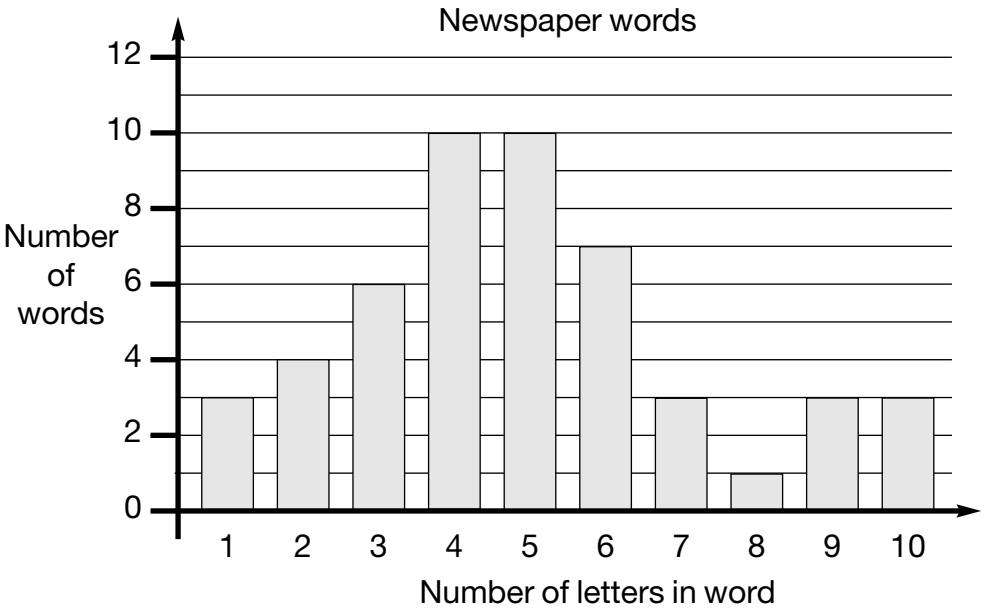
Total

1997 Test B cont.

20 Kelly chooses a **section** of a newspaper.

It has **50 words** in it.

She draws a bar chart of the number of letters in each word.



What **fraction** of the 50 words have **more than 6 letters**?

20

1 mark

Kelly says,

'23 of the 50 words have less than 5 letters. This shows that nearly half of all the words used in the newspaper have less than 5 letters in them'.

Explain why she **could be wrong**.

20

1 mark

Total

1996 Test A

6 Here is the cost of pizzas.

PIZZAS		
	Small	**Medium**
Ham	£4.20	£5.50
Salami	£4.40	£5.75
Mushroom	£4.50	£6.00
Cheese	£3.80	£4.95
Tuna	£4.25	£5.40
Extra tomato	50p	
Extra cheese	60p	

Jill orders **one small cheese** pizza with **extra tomato**.

What is the **total** cost?

6

1 mark

Ben buys **one small** pizza and **one medium** pizza.
They cost him **£10**.

Which **two** could they be?

one **small** _____ pizza

and one **medium** _____ pizza

6

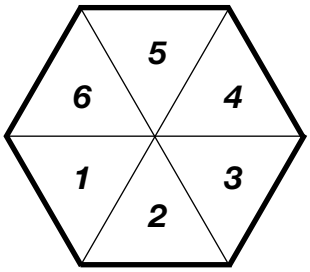
1 mark

Total

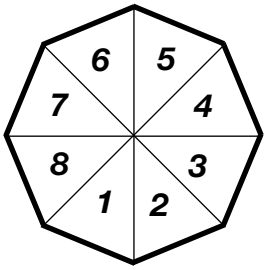
1996 Test A cont.

10 Here are two spinners.

Jill's spinner



Peter's spinner



Jill says,

'I am more likely than Peter to spin a 3.'

Give a reason why she is correct.

Jill is correct because

_____

_____

10

1 mark

Peter says,

'We are both equally likely to spin an even number.'

Give a reason why he is correct.

Peter is correct because

_____

_____

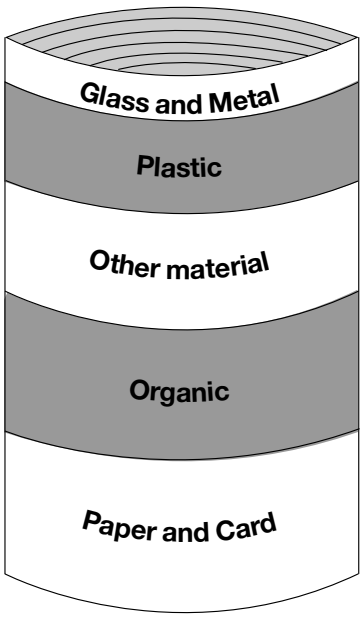
10

1 mark

Total

1996 Test A cont.

14 This diagram shows the proportions of waste by weight a family throws away in one year.



Estimate what **fraction** of the waste is **organic**.

14

1 mark

The family throws away about **35 kilograms of plastic** in a year.

Use the diagram to estimate the weight of **glass and metal** they throw away.

kg

14

1 mark

The family throws away **130 kg** of paper and card.

70% of this is **newspapers**.

What is the weight of **newspapers**?

Show your **working.** You may get a mark.

kg

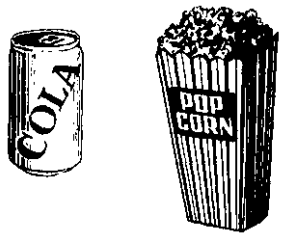
14

2 marks

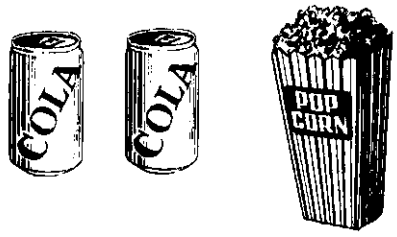
Total

1996 Test A cont.

17 A **drink** and a **box of popcorn** together cost **90p**.



2 drinks and a **box of popcorn** together costs **£1.45**.



What does a **box of popcorn** cost?

✎ _____ 17

1 mark

Explain how you got your answer.

✎ _____

_____

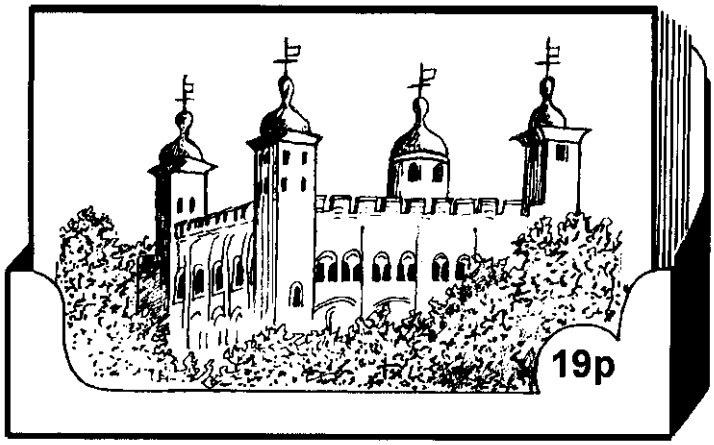
_____ 17

1 mark

Total

1996 Test B

2 Tim buys a 19p.



He pays **exactly** 19p with five coins.

What could the **five coins** be?

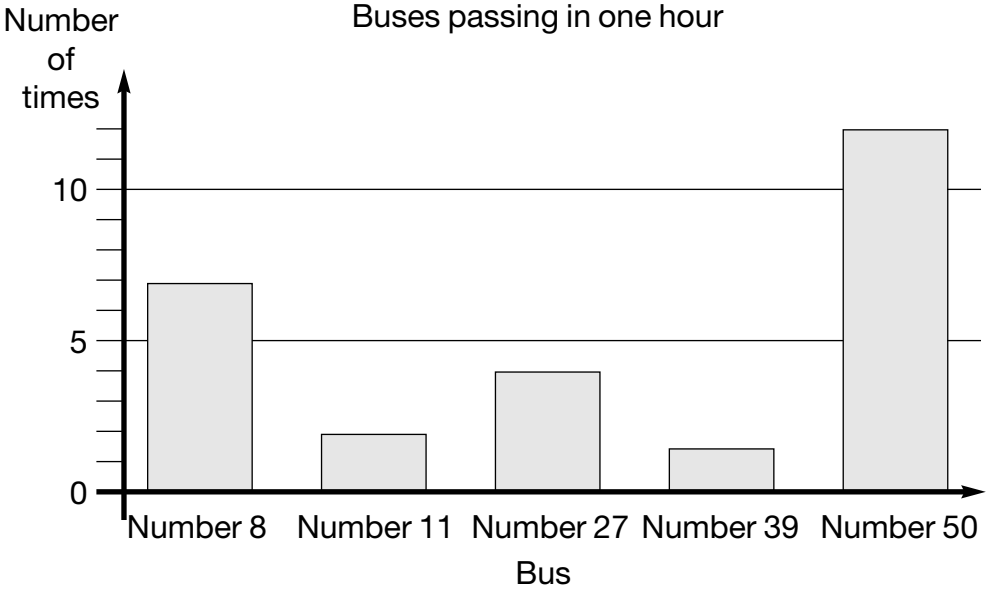
2

1 mark

Total

1996 Test B cont.

3 Anne makes a graph of buses passing a school in one hour.



How many times does a **Number 27** bus pass in the hour?

3

1 mark

Anne says,

'Bus number 39 passes least often in the hour.'

Explain how the graph shows this.

3

1 mark

How many more **Number 8** buses pass in the hour than **Number 11** buses?

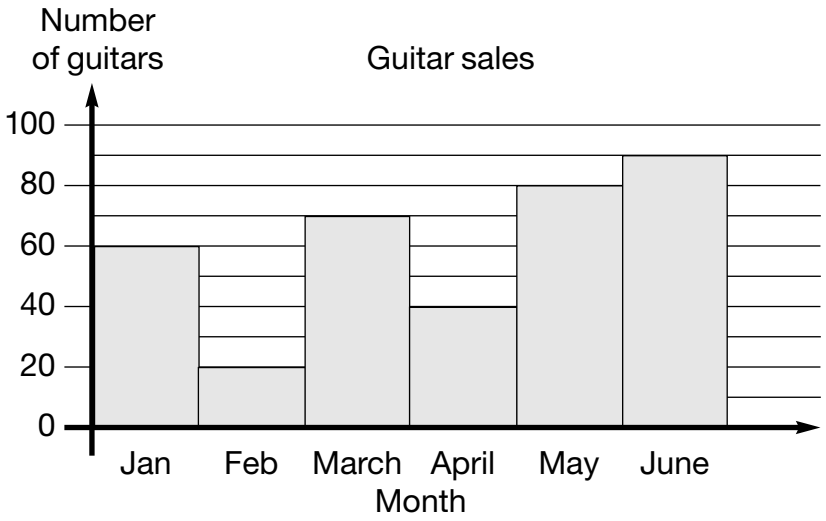
3

1 mark

Total

1996 Test B cont.

12 Here is a graph of guitar sales.



The table below shows the **change in sales** from month to month.

Use the graph to complete the table.

Change in Guitar sales	
January to February	Down 40
February to March	Up 50
March to April	
April to May	Up 40
May to June	

Which month had the **greatest change** in sales compared with the month before?

_____

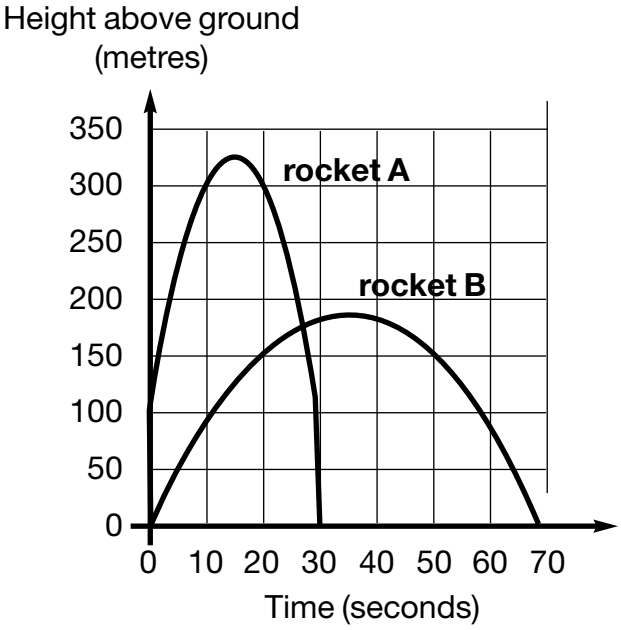
12

1 mark

Total

1996 Test B cont.

21 Jim draws a graph to show how high two rockets go during their flight.



Estimate **how much higher** rocket A reaches than rocket B.

✎ **metres**

21
1 mark

Estimate the **time** after the start when the two rockets are at the **same height**.

✎ **seconds**

21
1 mark

Jim says,

'The graph shows that rocket A was more than 200 m above the ground for about 23 seconds.'

Explain how the graph shows this.

_____

_____

21
1 mark

Total