

Unit 5

Problem solving 2

Five daily lessons

National
Numeracy Strategy

Year 6
Summer term

Unit Objectives Year 6

- **Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities** based on 'real life'; money or measures (including time), using one or more steps, including converting pounds to foreign currency, or vice versa, and calculating percentages such as VAT.
- **Explain methods and reasoning.**
- **Solve simple problems involving ratio and proportion.**
- Know rough equivalents of lb and kg, oz and g, miles and km, litres and pints or gallons.
- Develop from explaining a generalised relationship in words to expressing it in a formula using letters as symbols, e.g. the cost of n articles at 15p.
- Solve mathematical problems or puzzles, recognise and explain patterns and relationships, generalise and predict. Suggest extensions asking 'What if?....'

Pages 82–89

Pages 82–89

Page 27

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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 5.1
- Resource sheet 5.2
- Resource sheet 5.3
- Resource sheet 5.4
- Activity sheet 5.1
- Activity sheet 5.2
- OHT 5.1
- OHT 5.2
- OHT 5.3
- OHT 5.4
- Mental mathematics test questions (Unit 1)
- Timer
- Whiteboards
- Calculator
- Large sheet of paper
- Tape recorder

Year 5

Link Objectives

Year 7

- **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.**
- Solve simple problems using ideas of ratio and proportion.
- Explain a generalised relationship (formula) in words.
- Use units of time; use timetables.

- **Solve work problems and investigate in a range of contexts.**
- **Explain and justify methods and conclusions.**
- Solve simple problems about ratio and proportion using informal strategies.
- **Using letter symbols to represent unknown numbers or variables.**

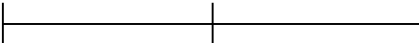
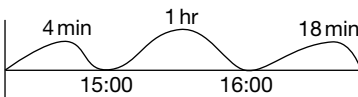
(Key objectives in bold)

department for
education and skills

Planning sheet	Day One (Page 1 of 2)	Unit 5 <i>Problem solving 2</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Consolidate mental strategies and knowledge.</p>	<ul style="list-style-type: none"> Ask the children some 5-, 10- and 15- second mental mathematics questions. Emphasise that each question will be read out twice and that the children should listen carefully to the question and jot down any information they think they will need to answer the question. Correct answers and discuss any difficulties or misconceptions. 	<p>Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities.</p> <p>Know rough equivalents of lb and kg, oz and g, miles and km, litres and pints.</p> <p>VOCABULARY milli cent kilo</p> <p>RESOURCES OHT 5.1 Activity sheet 5.1 Calculators Loose sheets of paper Resource sheet 5.1</p>	<ul style="list-style-type: none"> Display the first diagram on OHT 5.1. Explain that this represents tiles along a wall. Each tile is a square. Tell the children that you will give them one of the lengths A, B or C and they are to find the dimensions of the two tiles. <p>Start with A = 7.5 cm. Establish the children recognise that the tiles are 7.5 cm and the three together equal 22.5 cm therefore B will equal 22.5 cm.</p> <p>Say B = 19.5 cm. Establish tiles are 19.5 cm and 6.5 cm as above.</p> <div>Q If C = 26 cm, What are the dimensions of the tiles?</div> <ul style="list-style-type: none"> Correct answers and discuss methods. Ensure the children recognise that this gives the length of four small tiles. Show the second arrangement of tiles. Give children different values to the lengths L and M for children to find the dimensions of the tiles. <div>Q If N = 25 cm, what are the dimensions of these tiles?</div> <ul style="list-style-type: none"> Correct answers and strategies. Establish that the children can see that twice N is the equivalent of five small tiles. <div>Q If P = 31.5 cm, What are the dimensions of the tiles?</div> <ul style="list-style-type: none"> Correct answers and strategies. Ensure the children see that twice P is the length of seven small tiles. <div>Q If the large tiles have sides of 12 cm, what is the length of R?</div> <p>Correct answers and strategies. Establish that to answer this, the children have first to find the size of the small tile using the relationship that the length of two large tiles is equivalent to three small tiles.</p> <ul style="list-style-type: none"> On the board write: milli centi kilo <div>Q When do we use these words?</div> <ul style="list-style-type: none"> Establish that they apply to measures of length (metres), mass (grams), capacity (litres) <div>Q What do these words mean?</div> <ul style="list-style-type: none"> Ensure the children recognise milli is thousandth centi is hundredth kilo is thousand 	<ul style="list-style-type: none"> Give out Resource sheet 5.1. With the children discuss each scale in turn. <div>Q What is the value of the intervals on the scale?</div> <ul style="list-style-type: none"> Ensure the children can read the scales correctly. <div>Q Where are 57 mm, 950 g, 1.4 kg, 1 kg and 80 g on the scales?</div> <ul style="list-style-type: none"> The children should share their readings, identify the points and correct any misunderstandings. Establish how the litre, gallons scale can be used to connect between the two units. <div>Q What is 1.8 litres in gallons, 1.5 gallons in litres?</div> <ul style="list-style-type: none"> Compare estimates and remind children of the approximations they were using earlier in the lesson. Use the fact that 4.5 litres is about 1 gallon to compare the estimates. Use the thermometer to identify negative values and differences in temperature. <div>Q If the temperature was 7 °C and fell 11 ° what is the temperature now?</div> <ul style="list-style-type: none"> Correct answers and correct misunderstandings.
RESOURCES Timer Mental mathematics test questions (Unit 1)				

Planning sheet	Day One (Page 2 of 2)	Unit 5 <i>Problem solving 2</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
			<ul style="list-style-type: none"> Agree definitions and record them on a large sheet of paper for display. Remind the children of the imperial measures for length (feet, miles) weight (ounces, pounds) and capacity (pints, gallons). Record these on the sheet. <div>Q What are the rough equivalents between these different measures?</div> <ul style="list-style-type: none"> Remind children that 1 litre is about 1¾ pints, 4.5 litres is about 1 gallon. 1 kg is about 2.2lbs, 30 g is about 1 oz. 8 km is about 5 miles, 30 cm is about 1 foot. Record these on a sheet for display. Give out Activity sheet 5.1 and calculators. Collect answers and discuss methods and solutions. Correct any errors and misunderstandings. Ensure the children can convert using scaling down and back up strategies involving division and multiplication methods on the calculator. 	<ul style="list-style-type: none"> Remind the children that before reading any values from a scale they must first establish the size of the intervals. <div> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Convert between imperial and metric units using rough approximations. Identify and use appropriate operations to solve word problems involving measures. <p>(Refer to supplement of examples, section 6, pages 87, 91.)</p> </div>

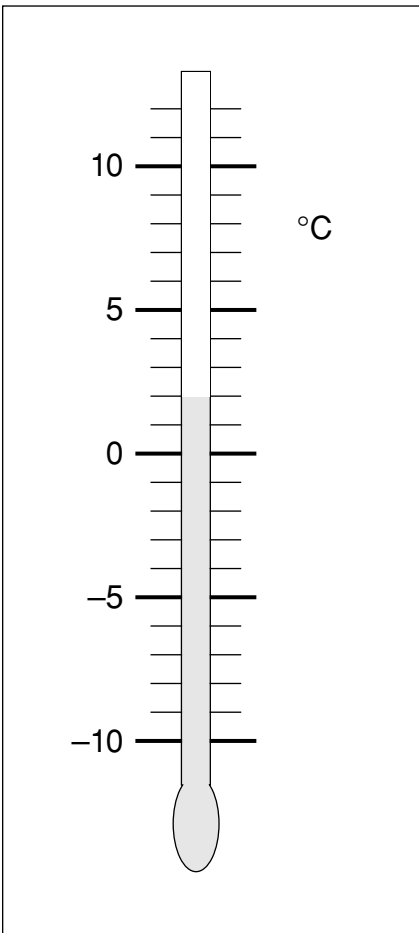
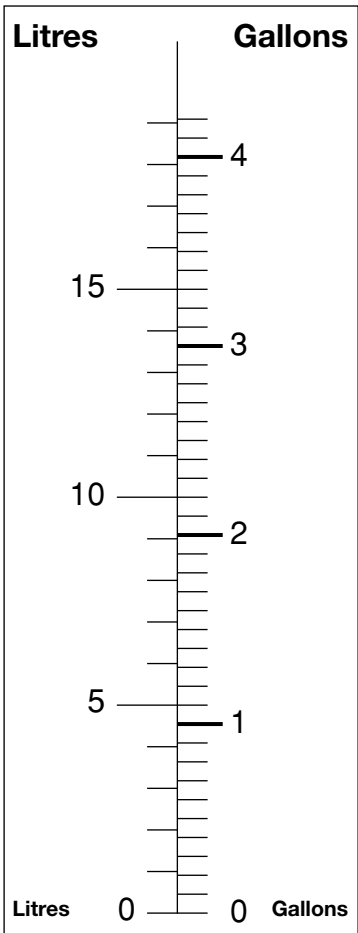
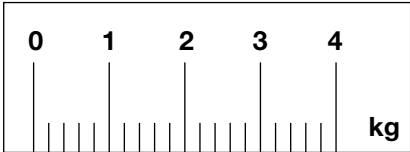
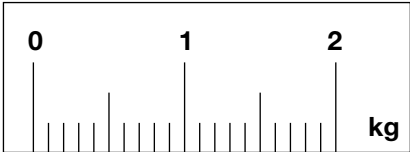
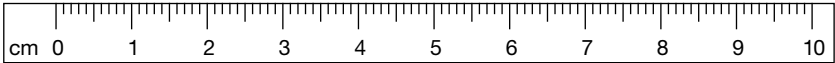
Planning sheet	Day Two	Unit 5 <i>Problem solving 2</i>		Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities		Teaching Activities/ Focus Questions
Consolidate mental strategies and knowledge. 					

Planning sheet	Day Three	Unit 5 <i>Problem solving 2</i>	Term: <i>Summer</i>	Year Group: 6	
Oral and Mental		Main Teaching		Plenary	
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions	
<p>Practise mental mathematics test.</p> <p>VOCABULARY 24-hour clock am pm</p> <p>RESOURCES Tape recorder Past mental arithmetic test paper and answer sheet (Resource sheet 5.3 or 5.4)</p>	<ul style="list-style-type: none">Explain to the children that you are giving them a past mathematics mental arithmetic test paper. Say that the questions are very similar to those that they have been getting used to over the weeks, there are 5-, 10- and 15-second questions on the paper. This time they will have an answer sheet which has space for answers and sometimes there are diagrams and numbers from the questions to help them. (Resource sheets 5.3 and 5.4.)Play the test tape if available, or read the questions as instructed.Collect in answer papers and discuss the questions with the children.<div>Q Was the answer sheet helpful?</div>Emphasise that the children should make as much use of the information on the answer sheet as they can.<div>Q Which questions were the most difficult? Why?</div>Discuss these with the children and give them some similar types of questions to address their difficulties.	<p>Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and time.</p> <p>RESOURCES Resource sheet 5.2. OHT 5.2 OHT 5.3 OHT 5.4 Related Key Stage 2 National test questions</p>	<ul style="list-style-type: none">On the board draw a line as shown:<div></div><p>Explain this is a time line representing a day.</p><div>Q How many hours are there in a day?</div>Agree there are 24 hours. Say the line represents 24 hours; have the children draw the line in their books.<p>Show the first two times on OHT 5.2</p><div>Q Where are these times on your time line?</div>Agree noon is in the centre and midnight will be at each end.<p>Show other pairs of times and get the children to identify them on their number lines. Use the time line on the board to confirm their answers are correct.</p>Show OHT 5.3. Discuss where these times will appear on the time line. Ensure the children can use the 12- or 24-hour clock and understand the meanings of am and pm.Show OHT 5.4 and ask the children to read the questions carefully.<div>Q Will the answer be a time of day or an amount of time?</div> <p>Correct responses and agree that the first answer requires an amount of time, the second requires a time. Collect answers. Emphasise that amount of time requires units—hours, minutes and seconds. Giving a precise time requires am, pm or the 24-hour clock.</p>	<ul style="list-style-type: none">Give out resource sheet 5.2. Discuss the timetable with the children.<div>Q From A-ville I want to get to D-mouth before 2:00 pm. Q Which bus should I catch and how long is the journey?</div>Ensure the children relate the time to the 24-hour clock and identify the bus.<div>Q I leave B-town at 6 o'clock, when do I arrive at F-hampton?</div><p>Correct responses and discuss strategies.</p>Ask the children to work in pairs and give one another questions to which the answer will be an amount of time or a time. Use some of the children's questions with the class.<ul style="list-style-type: none">Introduce a range of past test questions, allowing time for the children to work on them.Correct the responses and discuss the strategies they used.<div>Q What jottings helped you to find the answers?</div>Correct examples and discuss them.	<ul style="list-style-type: none">Remind the children that a time line can be helpful when finding an amount of time.<div>Q Aziz catches the 14:56 train which gets to his destination at 16:18. How long was the travelling?</div>Establish this is asking for an amount of time. With the children, use an empty time line to calculate the length of the journey.<div><p>14:56 15:00 16:00 16:18</p><p>Agree the answer is 1 hr 22 min.</p><div>Q The school opened at 8:10 am and closed at 5:25 pm; for how long was the school open?</div></div>Collect answers and ensure children can use a blank time line. <div><p>By the end of the lesson the children should be able to:</p><ul style="list-style-type: none">Solve problems involving time.Extract information from a timetable.Read and understand 12-hour clock notation.Calculate the difference between two given times.<p>(Refer to supplement of examples, section 6, pages 89, 101.)</p></div>

Planning sheet	Day Four (page 1 of 2)	Unit 5 Problem solving 2	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
Consolidate multiplication and division facts.	<ul style="list-style-type: none"> Get the class to recite the multiplication tables they have most difficulty with. Ask a series of division questions based around the multiplication tables, e.g. for 7 times tables. <div style="border: 1px solid black; padding: 5px;">Q What is $27 \div 7$, $\text{£}350 \div 50$, $6.3 \div 7$?</div>	Develop from explaining a generalised relationship in words, to expressing it in a formula using letters as symbols. VOCABULARY formula sequence multiple n^{th} term Related Key Stage 2 National test questions	<ul style="list-style-type: none"> On the board write the sequences: 4, 8, 12, 16..... 5, 9, 13, 17..... <div style="border: 1px solid black; padding: 5px;">Q What are the next four numbers in these sequences?</div> <p>Correct answers and record them on the board.</p> <div style="border: 1px solid black; padding: 5px;">Q How would you describe the first sequence?</div> <p>Draw out the fact the sequence is the 4 times table.</p> <div style="border: 1px solid black; padding: 5px;">Q Can we state a rule in words?</div> <ul style="list-style-type: none"> Encourage children to provide alternatives; ‘add 4 each time’, ‘find the next multiple of 4’ etc. <div style="border: 1px solid black; padding: 5px;">Q Can we write a formula for the sequence?</div> <ul style="list-style-type: none"> Write ‘n’ on the board and say that this stands for any number. Establish that the numbers in the sequence can be represented as $4n$. <div style="border: 1px solid black; padding: 5px;">Q How can we describe the second sequence?</div> <p>Use the first sequence to agree that the terms can be represented as $4n + 1$. Discuss the rotation and emphasise that replacing n by 1, 2, 3 etc. generates the sequence.</p> <ul style="list-style-type: none"> Repeat for other pairs of linked sequences that help children to derive formulae. Write on the board: $n + 6 = 8$. <div style="border: 1px solid black; padding: 5px;">Q What number is n representing?</div> <p>Agree $n = 2$ and emphasise that this time n stands for a particular number not any number.</p> <div style="border: 1px solid black; padding: 5px;">Q If $n + 3 = 9$, What is $n + 5$?</div> <ul style="list-style-type: none"> Collect the children’s answers and discuss their methods. Contrast just adding 2 to both sides with using $n = 6$ to work out $n + 5$. Repeat with other questions. 	<ul style="list-style-type: none"> On the board write the sequence: 3, 7, 11, 15, 19, 23 <div style="border: 1px solid black; padding: 5px;">Q What is the rule for the sequence?</div> <ul style="list-style-type: none"> Agree that it is ‘add four each time’ <div style="border: 1px solid black; padding: 5px;">Q How can we describe it using n?</div> <ul style="list-style-type: none"> Compare the sequence with the 4 times table and establish that the terms can be represented as $4n - 1$. <div style="border: 1px solid black; padding: 5px;">Q Is it true there will never be a multiple of 4 in the sequence?</div> <ul style="list-style-type: none"> Collect answers and ask for explanations. Agree that as the sequence is the 4 times table take one ($4n - 1$) there will never be a multiple of 4. <p>HOMEWORK – Set the children past test questions to work out at home.</p>

Planning sheet	Day Four (page 2 of 2)	Unit 5 <i>Problem solving 2</i>	Term: <i>Summer</i>	Year Group: 6					
Oral and Mental		Main Teaching		Plenary					
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions					
			<div><div><div><div>• Write on the board:</div><div><table><tr><td>n</td><td>3n + 1</td></tr><tr><td>10</td><td><div></div></td></tr><tr><td><div></div></td><td>22</td></tr></table></div><div><div>Q</div> What numbers go in the two boxes?</div></div><div><div>• Collect answers and discuss strategies. Talk through the earlier work and encourage the children to make jottings when they answer questions like these. Repeat using different numbers.</div><div>• Write: $s + t = 60$</div><div><div>Q</div> If s and t stand for whole numbers, what could they be?</div><div><div>• Collect different cases for s and t and ensure the children can interpret the letters.</div><div>• Write $a + b = 50$ and a is 10 less than b.</div><div><div>Q</div> What whole numbers could a and b stand for?</div><div><div>• Encourage the children to make jottings. Collect answers and discuss the strategies they need. Offer stories to help them see that $a + b = 50$.</div><div><div><div><div><div></div><div></div></div><div><div>50</div></div><div><div></div><div></div></div><div><div>a</div><div>b</div></div></div><div><div><div><div></div><div></div></div><div><div>a</div><div>10</div></div></div></div></div><div><div>Q</div> If we were asked to show our working, what would we write?</div><div><div>• Establish that the diagram and/or a calculation, e.g. $a + a = 40$, $a = 20$ would be enough. Repeat using different letters, equations and conditions.</div><div>• Introduce a range of test questions involving sequences and use of letters. Discuss the questions with the children. Identify which questions come from a test where calculators are allowed. Encourage the children to make jottings and annotate the questions.</div></div></div></div></div><div><div>By the end of the lesson the children should be able to:</div><div><div>• Express a relationship in symbols and start to use simple formulae, e.g. write a formula for the nth term in the sequence 3, 6, 9.....</div><div>(Refer to supplement of examples, section 6, page 81.)</div></div></div></div></div></div>	n	3n + 1	10	<div></div>	<div></div>	22
n	3n + 1								
10	<div></div>								
<div></div>	22								

Planning sheet	Day Five	Unit 5 <i>Problem solving 2</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Practise mental mathematics test.</p> <p>RESOURCES Tape recorder Past mental arithmetic test paper and answer sheet (Resource sheet 5.3 or 5.4)</p>	<ul style="list-style-type: none"> Return the marked mental arithmetic answer sheets to the children from the test paper on day 3. Discuss any common mistakes and misunderstandings. Remind the children to listen carefully, make use of the information on the answer sheet and make jottings. Give the children a second mental arithmetic test paper (Resource sheet 5.3 or 5.4). Play the tape or read the questions as instructed. Collect in answer sheets. Discuss the test with the children. <div>Q Which questions were the most difficult? Why?</div> <p>Give the children some similar questions and discuss how they might be answered to help address the children's difficulties.</p>	<p>Solve mathematical problems or puzzles.</p> <p>Review the week's work and address the objectives set out on the front page.</p> <p>RESOURCES Whiteboards</p> <p>VOCABULARY properties prime square divisible factor multiple</p>	<ul style="list-style-type: none"> Write a number on a whiteboard which the class cannot see. Say 'If I multiply this number by 8 the answer is 56.' <div>Q What is the number on my whiteboard?</div> <ul style="list-style-type: none"> Collect answers. Repeat using the 4 operations, include double and halve. Write a number on a whiteboard; say 'If I increased this number by one quarter the answer is 50.' Answer – '40'. <div>Q What is the number on my whiteboard?</div> <p>Collect answers. Repeat using increases and decreases by fractions and percentages.</p> <ul style="list-style-type: none"> Set the children to work in pairs posing one another similar questions. Write two numbers on a whiteboard. Say 'If I add 4 to one number and I subtract 7 from the other the answers are the same'. <div>Q What are the two numbers on my whiteboard?</div> <ul style="list-style-type: none"> Establish there are many answers but that the two numbers are 11 apart. Give the children some properties of the two numbers, e.g. one is a prime number, the other has 3 as a factor. Collect answers and confirm they meet the properties. Repeat using other pairs of numbers and different properties. Set the children to work in pairs posing one another similar questions. Return to the test questions the children were set for homework. Identify a question and collect answers. Alter the question in some way and discuss the children's strategies for answering the question. Repeat with other questions. 	<ul style="list-style-type: none"> On the board write: <div>Q If $n = 64$ which box will it end up in?</div> <ul style="list-style-type: none"> Ensure the children can interpret the 'tree' diagram. Repeat using other values for n and different criteria, e.g. prime and not prime, divisible by 3 and not divisible by 3, etc. Review the week's work. Identify the key points and remind the children of the objectives for the week. Give the children time to identify what they can do and what they still need to concentrate on. Collect responses and highlight the areas that still need attention. Emphasise what the children have been successful at during the week. Ask them to bring to the next lesson those questions they have had most difficulty with. <div>By the end of the lesson the children should be able to:</div> <ul style="list-style-type: none"> Solve puzzles and problems. Recognise what aspects of mathematics they can do and what still needs attention. <p>(Refer to supplement of examples, section 6, page 79.)</p>



Bus Timetable from A-ville to F-hampton

Monday to Friday

Town	Bus Number				
	621	624	626	627	629
A-ville	0700	0900	1200	1700	1930
B-town	0745	–	1245	1800	–
C-village	0845	–	1330	1845	–
D-mouth	0900	–	1345	1900	2115
E-port	1000	–	1445	2000	–
F-hampton	1130	1245	1615	2115	2330

Notes

Instructions

In the event of a tape failure, the teacher should follow the instructions below.

1. Children should have only pens or pencils. They should not have rubbers, rulers, calculators or any mathematical equipment. Access to paper for working out answers is **not** allowed.
2. Ensure that each child has an answer sheet. Tell the children to write their name and school in the box at the top of the answer sheet.
3. Ensure the children understand that:
 - they must complete the test on their own without copying or discussing questions with other children;
 - they will be told how long they have to answer each question and that the time given will increase from 5, to 10, to 15 seconds, as the test progresses through the three sections;
 - for some of the questions, the information they will need is included in or beside the answer box on the pupil answer sheet;
 - they are not allowed to use a calculator or any other mathematical equipment;
 - if they want to change their answer, they should put a cross through their first answer. They are not allowed to rub out any answers;
 - they should answer as many questions as they can. If they find a question too difficult, they should put a cross in the answer box, and wait for the next question;
 - they should not write in the white boxes in the blue margins;
 - they will not be allowed to ask any questions once the test has started.
4. You must have access to a clock or watch that measures accurately in seconds.
5. Read out the following script, using exactly these words:

Listen carefully to the instructions I am going to give you. When I have finished reading them, I will answer any questions. However, you will not be able to ask any questions once the test has begun.

I will start by reading a practice question. Then I am going to ask you 20 questions for the test. On your sheet there is an answer box for each question, where you should write the answer to the question and nothing else. You should work out the answer to each question in your head, but you may jot things down outside the answer box if this helps you. Do not try to write down your calculations because this will waste time and you may miss the next question. For some of the questions, important information is already written down for you on the sheet.

I will read out each question twice. Listen carefully both times. You will then have time to work out your answer. If you cannot work out an answer, put a cross in the answer box. If you make a mistake, cross out the wrong answer and write the correct answer next to it. There are some easy and some harder questions, so don't be put off if you cannot answer a question.

6. Stop and answer any questions that the children may have.

7. Read out the following:

Here is the practice question to show you what to do.

I will read the question twice, and you will have five seconds to work out the answer and write it in the answer box.

What is twenty-eight add five?

Repeat the question.

What is twenty-eight add five?

Wait five seconds (measured accurately using a clock or watch), then read out the following:

Now put down your pen or pencil.

8. Ensure that the children have correctly placed their answers to the practice question on their answer sheets. Remind the children that, for some questions, information is provided in or beside the answer box. When they are ready to begin the test, tell the children that you will not be able to answer any further questions, or interrupt the test, once you have started reading the questions.
9. The questions are given on the following pages. The questions must be read out exactly as written. Start by stating the question number, then read out each question twice before leaving the 5-, 10- or 15- second response time. These timings must be strictly adhered to.
10. At the end of the test, tell the children to put down their pens or pencils, then collect their answer sheets.

Key Stage 2

Mathematics 2001 Mental Arithmetic Test

Test Questions

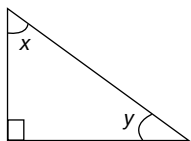
'Now we are ready to start the test. For this group of questions, you will have 5 seconds to work out each answer and write it down.'

	The questions:	Pupil Sheet	
1	How many fifty-pence pieces are there in three pounds?		£3
2	Multiply five by nine.		
3	Divide three hundred and ninety by ten.		390
4	What is three quarters as a decimal?		
5	What is nought point two six divided by ten?		0.26

'For the next group of questions, you will have 10 seconds to work out each answer and write it down.'

	The questions:	Pupil Sheet	
6	What is half of eight hundred and sixty?		860
7	My watch shows two-fifty p.m. What time will it show in thirty minutes?	pm	2:50pm
8	What is one hundred subtract twenty-four?		
9	What is two hundred and seventy-six centimetres to the nearest metre?	m	276cm
10	What is double fifteen point five?		15.5
11	Each side of a pentagon is twelve centimetres. What is the perimeter of the pentagon?	cm	12cm
12	What is twelve multiplied by twenty-five?		12 25
13	Look at your answer sheet. Put a ring around the number which is the approximate weight of a thirty-centimetre ruler.	2g 20g 200g 2kg 20kg	
14	Three times a number is one hundred and two. What is the number?		
15	Look at your answer sheet. Put a ring around the decimal which is equivalent to two-fifths.	0.25 0.52 0.5 0.4 0.2	

'For the next group of questions, you will have 15 seconds to work out each answer and write it down.'

	The questions:	Pupil Sheet		
16	Add together fourteen, twenty-three and forty-one.		14	23 41
17	Look at your answer sheet. Put a ring around the number which is a multiple of thirty-five.	600 700 800 900 1000		
18	Look at your answer sheet. Put a ring around the smallest number.	0.27 0.207 0.027 2.07 2.7		
19	Calculate ten minus four point three five.		10	4.35
20	Look at the triangle. Angle y is fifty-five degrees. Calculate the size of angle x .	°		

'Now put down your pen or pencil. The test is finished.'

Answer sheet

Key Stage 2 mathematics 2001 mental arithmetic test

First Name

Last Name

School

Total marks

Practice question

Time: 5 seconds

1

£3

1

2

2

3

390

3

4

4

5

0.26

5

Time: 10 seconds

6

860

6

7

pm

2:50pm

7

8

8

m

276cm

9

15.5

10

11

cm

12cm

11

12

12

25

12

13

2g

20g

200g

2kg

20kg

13

14

14

15

0.25

0.52

0.5

0.4

0.2

15

Time: 15 seconds

16

14

23

41

16

17

600

700

800

900

1000

17

18

0.27

0.207

0.027

2.07

2.7

18

19

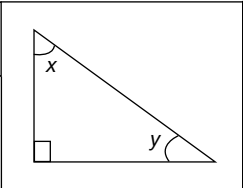
10

4.35

19

20

°



20

Key Stage 2

Mathematics 2000 Mental Arithmetic Test

Test Questions


'Now we are ready to start the test. For this group of questions, you will have 5 seconds to work out each answer and write it down.'

	The questions:	Pupil Sheet	
1	What is double forty-five?		
2	Write three hundred and twenty-six to the nearest ten.		326
3	Look at the times on your answer sheet. Put a ring round the time which is the same as fourteen-thirty.	2:30am 4:30pm 4:30am 1:43pm 2:30pm	
4	How many sevens are there in two hundred and ten?		210
5	How many metres are there in one point five kilometres?	m	

'For the next group of questions, you will have 10 seconds to work out each answer and write it down.'

	The questions:	Pupil Sheet	
6	How many minutes are there in an hour and a half?	Minutes	
7	What is one and a half added to four and a half?		1 $\frac{1}{2}$ 4 $\frac{1}{2}$
8	What is the sum of twenty-three and twenty-seven?		23 27
9	Calculate the difference between five hundred and two hundred and thirty.		500 230
10	What is one hundred and five divided by five?		105
11	What is three-quarters of two hundred?		
12	What is twenty-one multiplied by nine?		21
13	Imagine a cube. How many vertices does it have?		
14	What is four multiplied by three point five?		3.5
15	What is two per cent of three hundred?		

'For the next group of questions, you will have 15 seconds to work out each answer and write it down.'

The questions:		Pupil Sheet	
16	Look at the prices on your answer sheet. What is the total cost of two adults and one child?	£	Cinema Prices
			Adults £5.50 Children £3.00
17	What is the remainder when ninety-seven is divided by five?		97
18	Look at your answer sheet. Put a ring around the numbers which are factors of thirty.	4 5 6 20 60 80	
19	Look at the angle drawn on your answer sheet. Put a ring around the number which is the approximate size of the angle.		
		60° 90° 110° 135° 240°	
20	A bag of four oranges costs thirty-seven pence. How much do twelve oranges cost?		37p

'Now put down your pen or pencil. The test is finished.'

Key Stage 2 mathematics 2000 mental arithmetic test

First Name
Last Name

School

Total marks

Practice question

Time: 5 seconds

11

23262

3

2:30am 4:30pm 4:30am
1:43pm 2:30pm

3

42104

5m5

Time: 10 seconds

6minutes6

71½ 4½7

823 278

9500 2309

1010510

1111

122112

1313

143.514

1515

Time: 15 seconds

16

£

Cinema Prices
Adults £5.50
Children £3.00

16


179717

18

4 5 6 20 60 80

18

19



19

2037p20

- In 1980 petrol was sold at £1.25 a gallon. In 2002 it is about 76p a litre.
How much is a gallon of petrol in 2002?
How much was a litre of petrol in 1980?
A car holds 35 litres of petrol. What is the difference in cost between filling up the car with petrol in 1980 and 2002?
- 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	

Rebecca drives from Newcastle to London and back. How many **miles** has she travelled?

Sinead says 'My car does about 35 miles to the gallon. For my journey from Cardiff to Manchester I will need about 4 gallons of petrol'. Is Sinead correct? Circle Yes or No.

Yes / No

Explain your reasons:

- Sam finds a recipe for soup in an old cookery book. The ingredients are:

6 pints of stock
3 lb of potatoes
1 lb of leeks
12 oz of carrots
 $\frac{1}{2}$ pint of cream
2 oz of parsley

Re-write the recipe in metric units.

1. If six ice-creams cost £4.50, how much will ten ice-creams cost?

2. Chocolate drops cost £1.20 for 100 g.
What is the cost of 425 g of chocolate drops?

3. Nuts cost 60p for 100 g.
What weight of nuts costs £1.50?

4. The recipe below is for six people.

40 cl of milk

3 eggs

120 g of cheese

Sue wants to make enough for nine people. What quantities of milk, eggs and cheese will she need?

Nazeen uses a recipe with 150 g of cheese. How much milk is in the recipe?

5. Eight fishcakes require:

300 g of fish

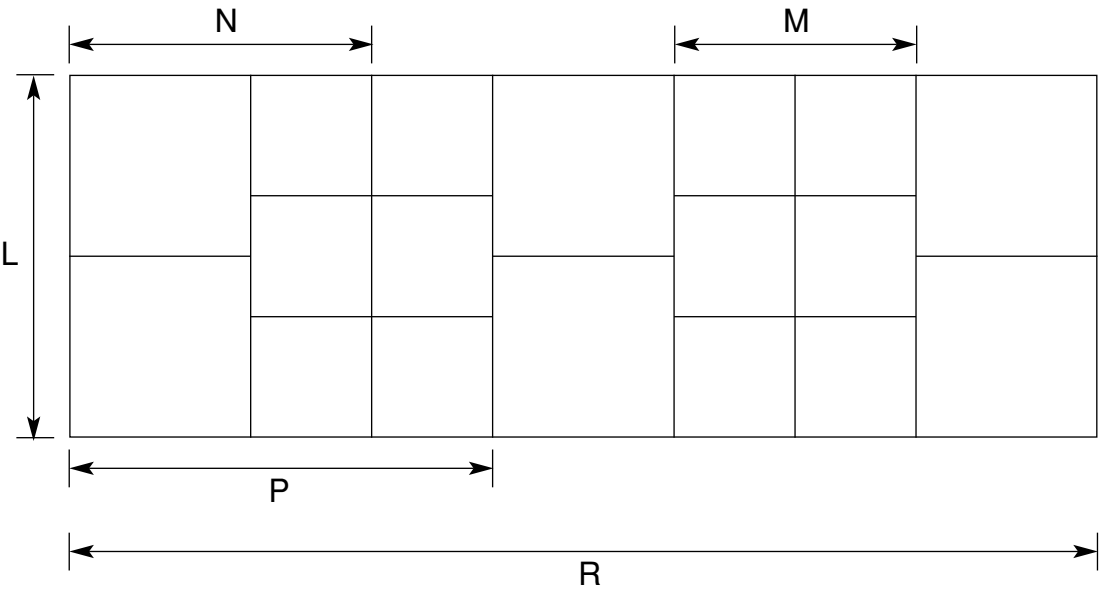
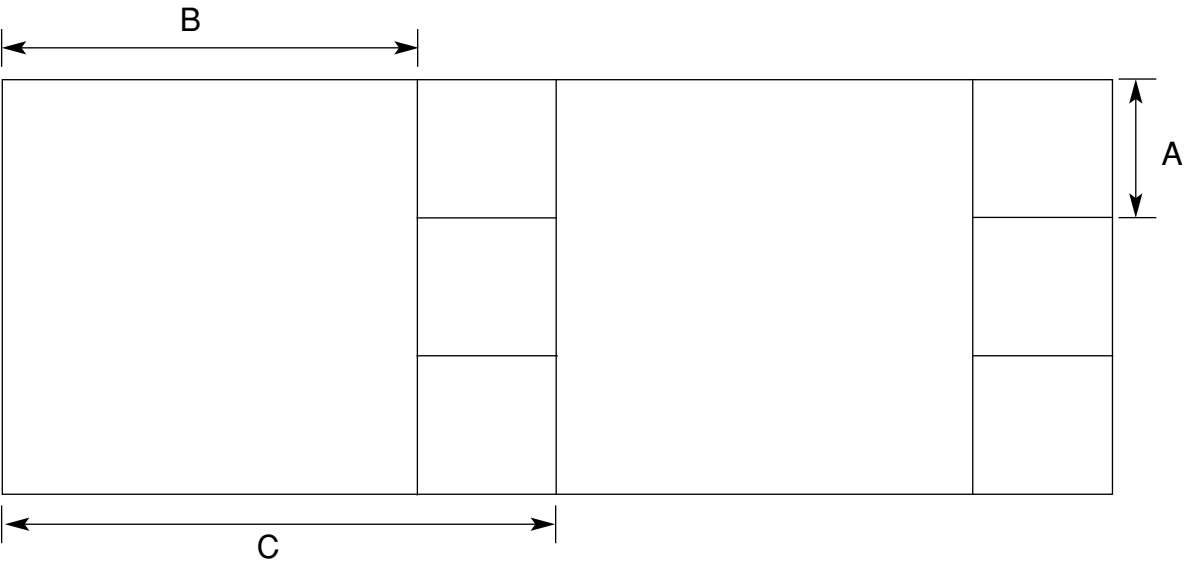
500 g of potatoes

100 g of breadcrumbs

Tara wants to make ten fishcakes, what quantities of fish, potatoes and breadcrumbs does she need?

6. Teabags: Packet A has 200 g and costs 96p
 Packet B has 450 g and costs £1.75

Sheena says Packet A is cheaper. Alan says Packet B is cheaper. Who is right?
Explain your reasons:



noon	midnight
12:00	00:00
3:05 pm	4:30 am
13:00	23:55
09:30	$\frac{1}{4}$ past 1 am

$\frac{1}{4}$ to 3 pm	5 past 12
20 to 8 am	3 o'clock pm
02:35	17:40
3:30 am	25 to 7 pm

Fireworks Display
8:30 pm to 9.15 pm

How long does the display last?

Punch and Judy Show
Starts 10:15 am
Lasts for an hour and a half

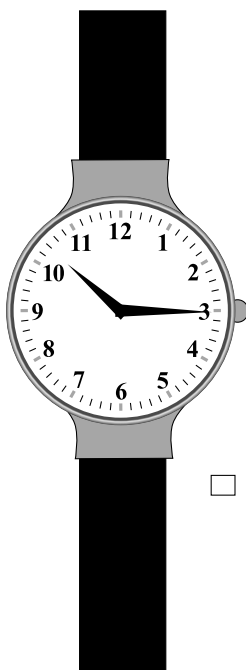
What time does the show finish?

Related Key Stage 2 National test questions:

2001 Test A

10

This was the time on Selina's watch when she **set off** for a walk.



What time did the watch show 20 minutes **before** this?



1 mark

10

What time did it show an hour and a half **after she set off** for the walk?



1 mark

10

Total

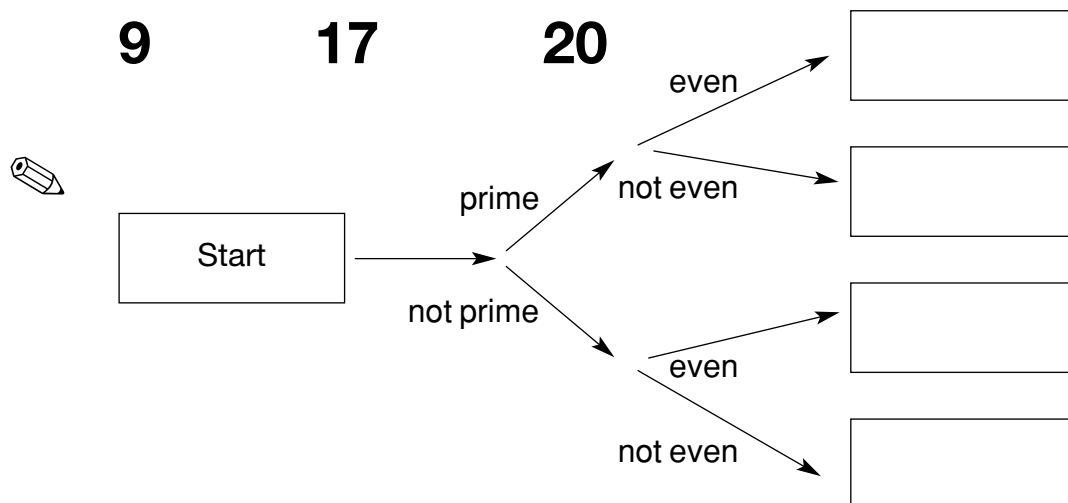
2001 Test A cont.

12

Here is a diagram for sorting numbers.

Write these three numbers in the correct boxes.

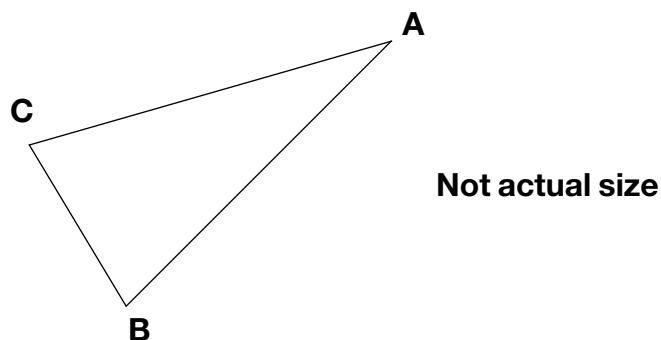
You may not need to use all of the boxes.



12

2 marks

21

Triangle **ABC** is isosceles and has a perimeter of 20 centimetres.Sides **AB** and **AC** are each twice as long as **BC**.**Calculate** the length of the side **BC**.Do **not** use a ruler.

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

cm

21

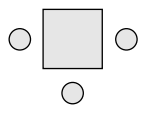
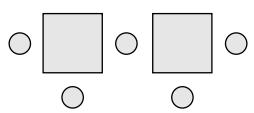
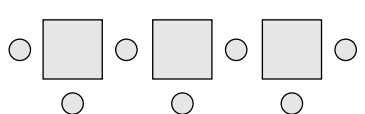
2 marks

Total

2001 Test A cont.

23

Here is a sequence of patterns made from squares and circles.

	number of squares	number of circles
	1	3
	2	5
	3	7

The sequence continues in the same way.

Calculate how many **squares** there will be in the pattern which has **25 circles**.



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

2 marks

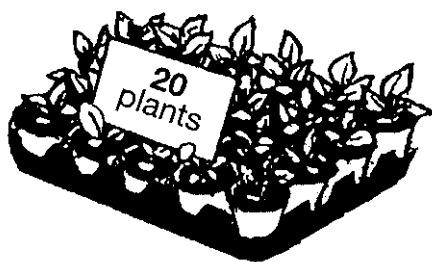
23

Total

2001 Test B

5

Plants are sold in trays of **20**.



Ivana buys **7 trays** of plants.

How many plants is this?



1 mark

5

David wants **240 plants**.

How many trays does he need to buy?

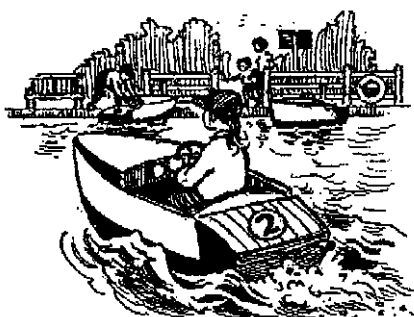


1 mark

5

Total

9



Boat Hire	
Motor boats £1.50 for 15 minutes	Rowing boats £2.50 for 1 hour

How much does it cost to hire a **rowing boat** for three hours?



£

9

1 mark

Sasha pays **£3.00** to hire a **motorboat**.

She goes out at **3:20 pm**.

By what time must she **return**?



pm

9

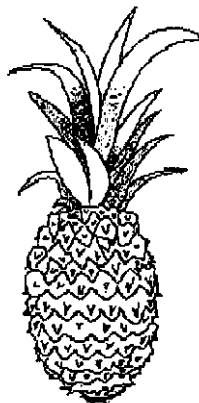
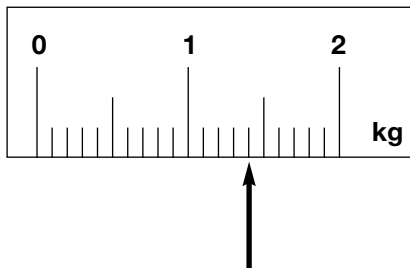
1 mark

Total

2001 Test B cont.

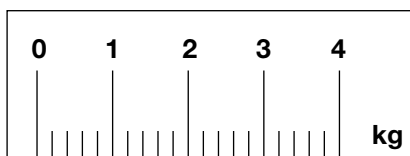
17

On this scale, the arrow (\uparrow) shows the weight of this pineapple.



Here is a **different** scale.

Mark with an arrow (\uparrow) the weight of the **same** pineapple.



17

1 mark

Total

2001 Test B cont.

19

Here is a recipe for raspberry ice cream.

raspberry ice cream
for 8 people

$\frac{1}{2}$ litre of cream

1 kg raspberries

250 g sugar



This recipe is for **8 people**.

Josie makes enough raspberry ice cream for **12 people**.

How much **cream** does she use?



litre

19

1 mark

Fred makes raspberry ice cream in the same way.

He uses **$2\frac{1}{2}$ kg** of **raspberries**.

How much **sugar** does he use?



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

g

19

2 marks

Total

2001 Test B cont.

22

The rule for this sequence of numbers is 'add 3 each time'.

1 4 7 10 13 16 ...

The sequence continues in the same way.

Mary says,

'No matter how far you go there will never be a multiple of 3 in the sequence'.

Is she correct?
Circle Yes or No.

Yes / No

Explain how you know.



27

p and **q** each stand for whole numbers.

$$\mathbf{p + q = 1000}$$

p is 150 **greater** than **q**.

Calculate the numbers **p** and **q**.



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



p =

q =

22

1 mark

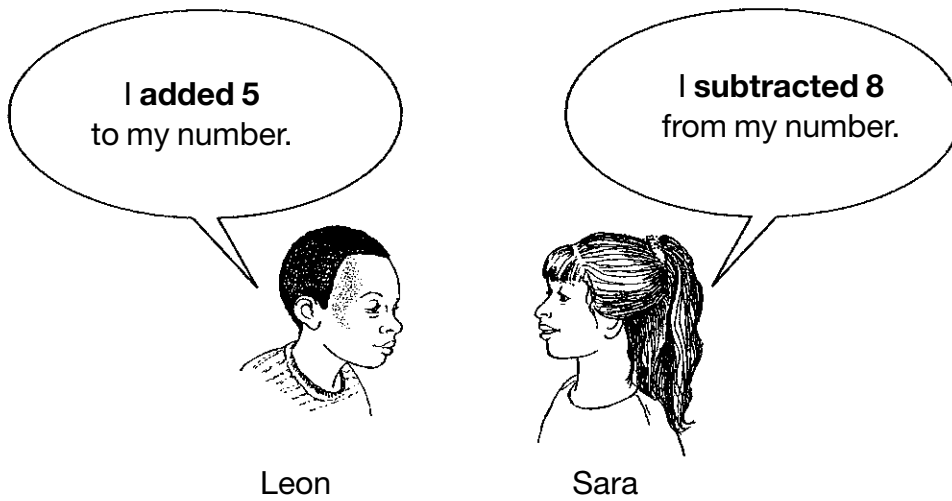
27

2 marks

Total

2000 Test A

12

Leon and Sara each started with **different** numbers.Leon and Sara both get the **same** answer.

What numbers could they have started with?



Leon

Sara

12

1 mark

20

This sequence of numbers **goes up by 40** each time.

40 80 120 160 200 ...

This sequence continues.

Will the number **2140** be in the sequence?

Circle Yes or No.

**Yes / No**

Explain how you know.



20

1 mark

Total

15



Peanuts cost **60p** for **100 grams**.

What is the cost of **350 grams** of peanuts?



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

15
2 marks

Raisins cost **80p** for **100 grams**.

Jack pays **£2** for a bag of raisins.

How many **grams of raisins** does he get?



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

g

15
2 marks

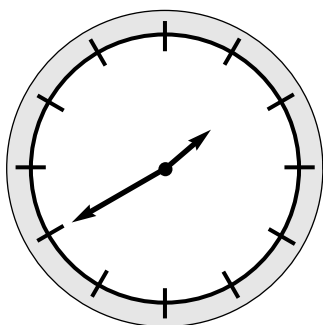
Total

2000 Test B

3

Here are three clock faces.

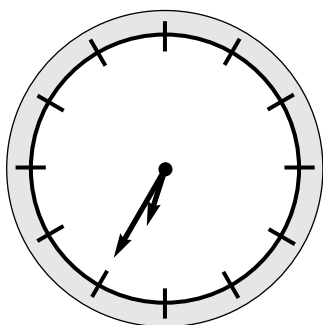
Match each clock face to the same time on a digital clock.



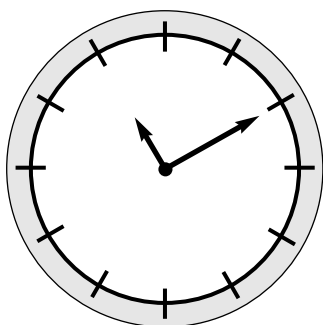
11:10

2:55

1:40



8:10



6:35

7:35

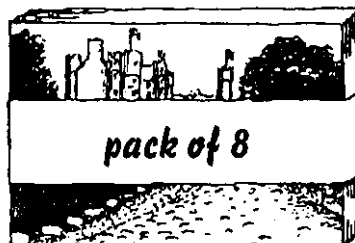
3

1 mark

Total

5

A shop sells postcards in **packs of 6** and **packs of 8**.



Alan bought **4 packs of 8 cards**.

How many cards did he get?



5

1 mark

Shereen bought some **packs of 6 cards**.

Altogether she has **30 cards**.

How many **packs of 6** did she buy?



5

1 mark

Total

8



These are the opening times at a swimming pool.

	opening times		
	am		pm
Monday	Pool closed		
Tuesday			
Wednesday	10:30	to	5:30
Thursday	10:30	to	8:30
Friday	10:30	to	9:00
Saturday	8:00	to	6:00
Sunday	7:00	to	4:00

How many **hours** is the pool open on a **Sunday**?



hours

8

1 mark

Which **day** has the **latest** closing time?



8

1 mark

Habib arrives at the pool at **5:20 pm** on **Saturday**.

How many **minutes** is it before the pool closes?



minutes

8

1 mark

Total

2000 Test B cont.

18

n stands for a number.

Complete this table of values.



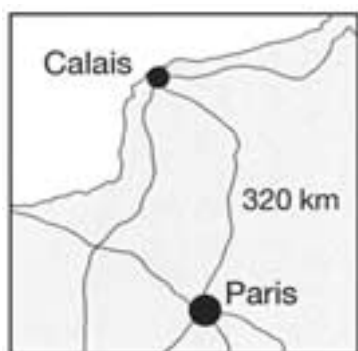
n	$5n - 2$
20	<input type="text"/>
<input type="text"/>	3

18

1 mark

21

Here is a map of part of France.



The map shows that the distance from Calais to Paris is **320 kilometres**.

5 miles is approximately **8 kilometres**.

Use these facts to calculate the approximate distance in **miles** from Calais to Paris.



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

miles

21

2 marks

Total

2000 Test B cont.

Samira bought this present in France.



44.85 FF

She paid **44.85 French Francs** for it.

9.75 French Francs equal **£1**.

What was the cost of the present in **pounds and pence**?



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



£

2 marks

21

Total

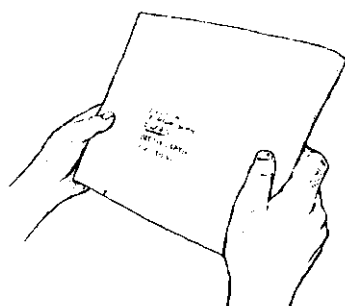
1999 Test A

3

This table shows the cost of sending a letter.

Mass	Cost in pence	
	first class	second class
up to 60 g	26	20
61 to 100 g	39	31
101g to 150 g	49	38
151g to 200 g	60	45
201g to 250 g	70	55

Paul is sending a letter.

It costs **38p second class**.How much would it cost him to send it **first class**?
 p
Jenny has a letter with a mass of **170 g**.

What does it cost to send it first class?


 p

3

1 mark

3

1 mark

Total

1999 Test A cont.

6

Rob has some number cards.



He holds up a card.

He says,

'If I multiply the number on this card by 5, the answer is 35'.

What is the number on the card?



6

1 mark

He holds up a different card.

He says,

'If I divide the number on this card by 6, the answer is 4'.

What is the number on the card?

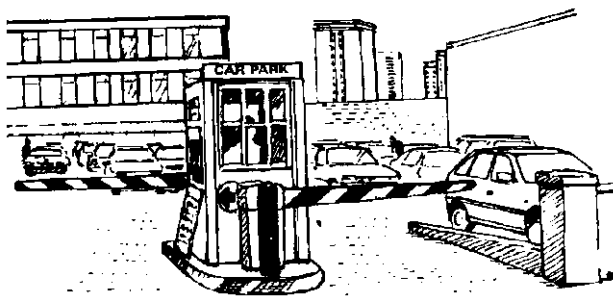


6

1 mark

Total

14



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

Emma parks her car at **9.30 am**.

She collects the car at **1.20 pm**.

How much does she pay?



14

1 mark

Dan and Mark both use the car park.

Dan says,

'I paid exactly twice as much as Mark but I only stayed 10 minutes longer'.

Explain how Dan could be correct.



14

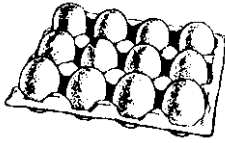
1 mark

Total

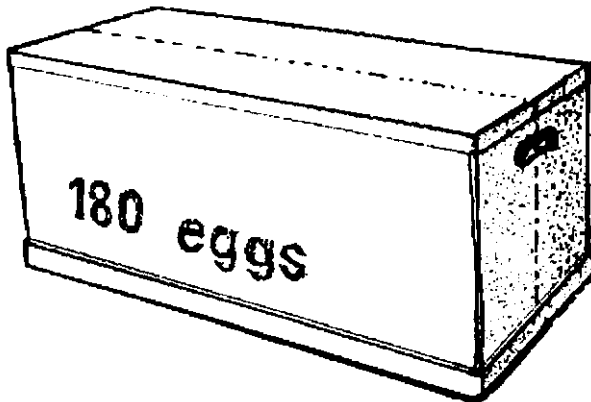
1999 Test A cont.

16

Eggs are put in **trays** of 12.



The trays are packed in boxes.



Each **box** contains **180 eggs**.

How many **trays** are in each **box**?



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

16

2 marks

17

Megan makes a sequence of numbers starting with **100**.

She **subtracts 45** each time.

Write the next **two** numbers in the sequence.



100

55

10

17

2 marks

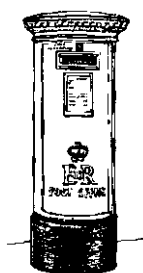
Total

1999 Test B

3

These are the times letters are collected from a post box.

Monday to Friday	Saturday	Sunday
8 am 2 pm 6:30 pm	11:30 am	no collection

What is the **latest** time letters are collected on **Wednesday**?

3

1 mark

Carla posts a letter at **9 am on Monday**.How **long** will it be before it is collected?

hours

3

1 mark

Gareth posts a letter on **Saturday at 3 pm**.

When is it collected from the post box?



day time

3

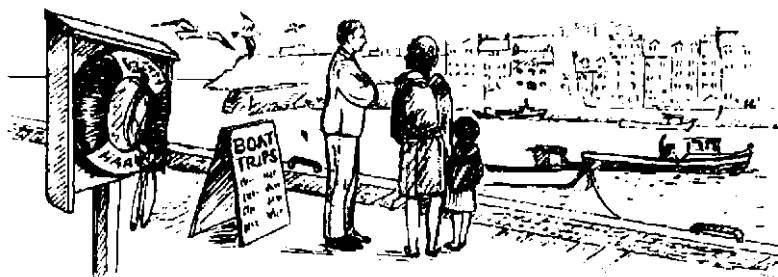
1 mark

Total

1999 Test B cont.

7

Tom, Amy and Helen want to go on a boat trip.



There are three boats.

Lark	Heron	Kestrel
50 minute trip	70 minute trip	90 minute trip
Tickets £2.75 each	Tickets £3.50 each	Tickets £4.20 each

How much does it cost altogether for **three** people to go on the **Lark**?


£

1 mark

7

Tom and Amy go on the **Heron**.

They leave at **2:15 pm**.

At what **time** do they return?


pm

1 mark

7

Helen goes on the **Kestrel** and **gets back at 4:15 pm**.

At what **time** did the boat leave?


pm

1 mark

7

Total

Unit 5 Year 6 (Summer Term)

1999 Test B cont.

8

Here is the calendar for August 1998.

August 1998

Sun	Mon	Tues	Wed	Thur	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Simon's birthday is on **August 20th**.

In 1998 he had a party on the **Sunday after** his birthday.

What was the **date** of his party?



8
1 mark

Tina's birthday is on **September 9th**.

On what **day of the week** was her birthday in 1998?



8
1 mark

12

Halid makes a sequence of 5 numbers.

The first number is 2.

The last number is 18.

His rule is to add the **same amount** each time.

Write in the **missing** numbers.



2				18
---	--	--	--	----

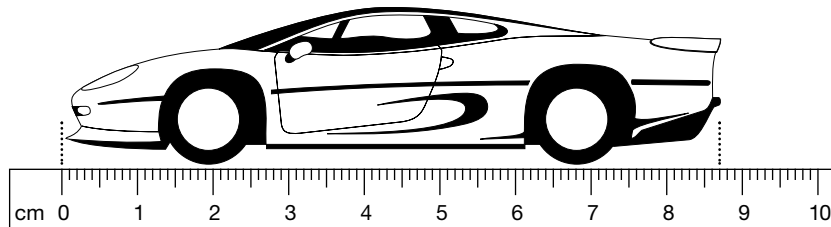
8
1 mark

Total

1999 Test B cont.

14

Here is a drawing of a model car.



What is the **length** of the model?

Give your answer in **centimetres**, correct to one decimal place.


 cm

14
1 mark

The height of the model is **2.8 centimetres**.

The height of the real car is **50** times the height of the model.

What is the **height** of the **real car**?

Give your answer in **metres**.



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

m

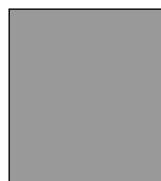
14
2 marks

Total

1999 Test B cont.

21

Mr Jones has two sizes of square paving stones.

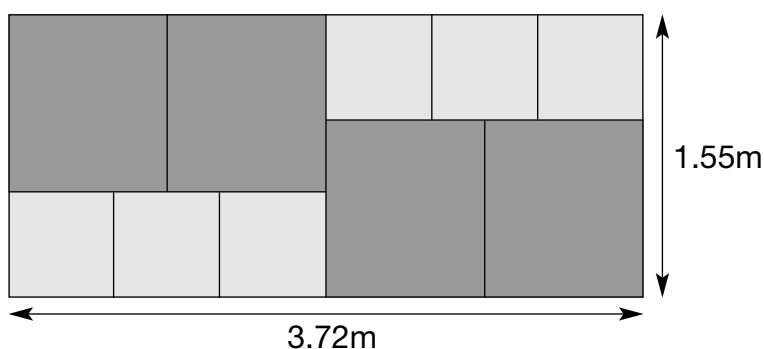


large



small

He uses them to make a path.



The path measures **1.55 metres** by **3.72 metres**.

Calculate the **width** of a **small paving stone**.



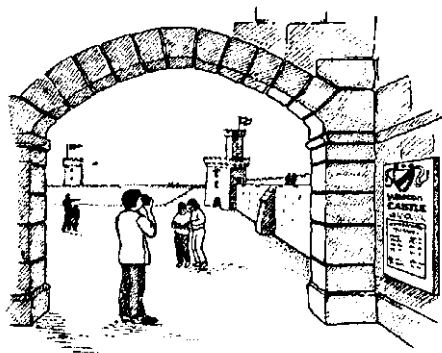
Show
your **method**.
You may get
a mark.

2 marks

21

Total

6



Weston Castle Opening Times

	July 1st to August 31st	September 1st to June 30th
Monday to Friday	10 am – 7 pm	closed
Saturday and Sunday	9 am – 8 pm	1 pm – 5 pm

At what time does the castle **close** on **Wednesday July 15th**?


 pm

6
1 mark

For which **months** is the castle open **seven days a week**?



6
1 mark

On **Sunday March 8th** John goes into the castle at **3 pm**.

He stays until closing time.

For how many **hours** does he stay in the castle?


 hours

6
1 mark

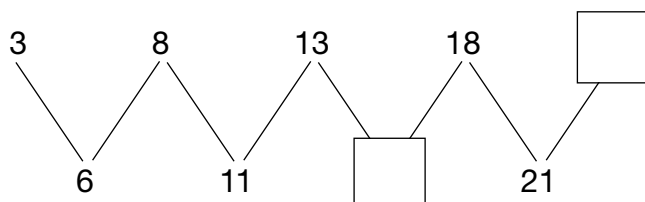
Total

1998 Test A cont.

3

Here is a number sequence.

Write in the **missing** numbers.



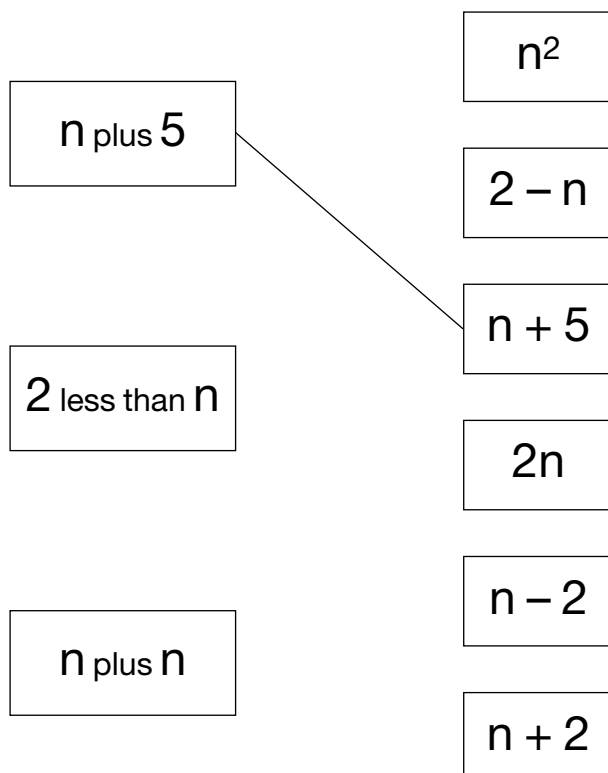
3
2 marks

20

n stands for number.

Match the equivalent expressions.

One has been done for you.



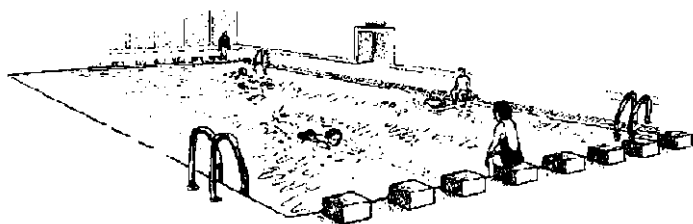
20
2 marks

Total

1998 Test B

5

One length of a swimming pool is 25 metres.

How many **lengths** are there in a **150-metre** race?

Six children swim a 50-metre race.

Lane	Name	Time in Seconds
1	Bryn	92.4
2	Craig	86.3
3	Fiona	90.4
4	Harun	85.1
5	Jody	84.7
6	Dean	89.2

Who finished **first**?

How many seconds faster was **Dean** than **Fiona**?

5

1 mark

5

1 mark

5

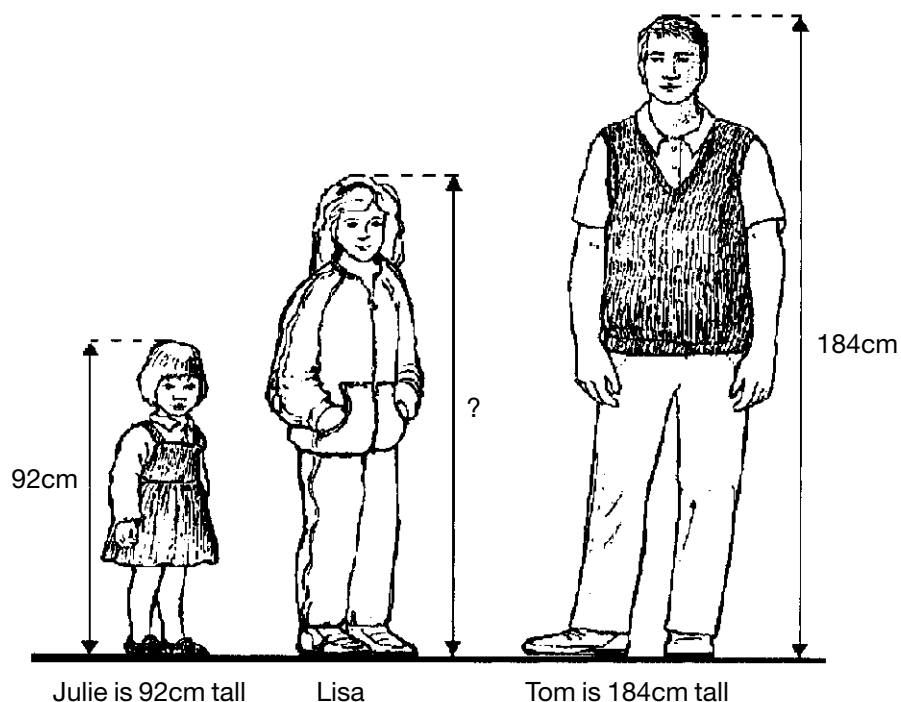
1 mark

Total

1998 Test B cont.

16

Here is a picture of three people.



Lisa's height is **halfway between** Julie's height and Tom's height.

Calculate Lisa's height.



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

cm

2 marks

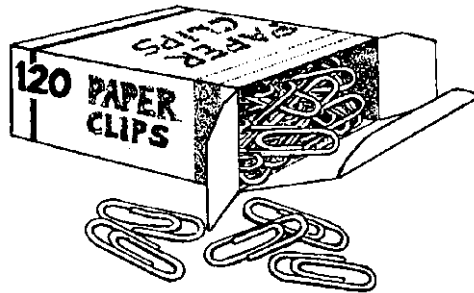
16

Total

1998 Test B cont.

22

Every day a machine makes **100 000 paper clips** which go into boxes.



A **full box** has **120** paper clips.

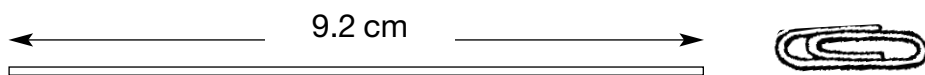
How many **full boxes** can be made from **100 000** paper clips?



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

22
2 marks

Each paper clip is made from **9.2 centimetres** of wire.



What is the **greatest number** of paper clips that can be made from **10 metres** of wire?



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

22
2 marks

Total



Here are the times of some television programmes.

Channel 1	
7.00	Cartoon
7.15	Film
9.00	News
9.30	Weather
9.35	Sport
10.20	Drama

Channel 2	
7.00	Local news
7.45	Quiz Show
8.30	Comedy
9.00	Hospital Drama
10.00	Pop Chart
10.40	Film

What is showing on **Channel 2** at **ten minutes to eight**?



.....

8

1 mark

Tom watches **Hospital Drama** and then **changes** to **Channel 1** at the end.

What is showing on **Channel 1** when he changes channel?



.....

8

1 mark

The film on **Channel 2** starts at **10.40**

It lasts for **one and a half hours**.

At what time does the film **end**?



8

1 mark

Total

1997 Test A cont.

11

Here is a number sequence.

Write the **missing** number.



1

3

6

10

Explain how you worked it out.



11

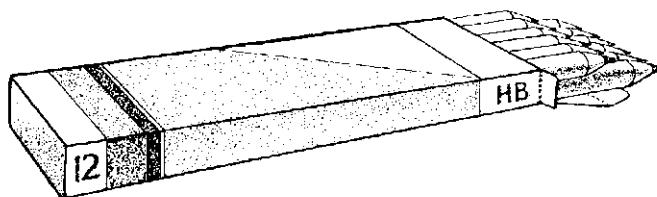
2 marks

Total

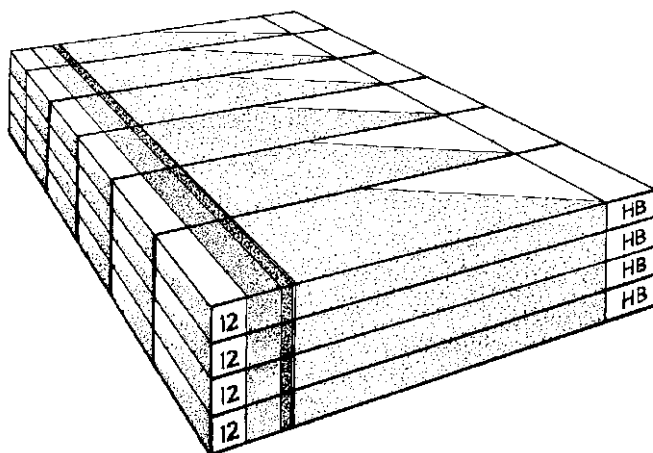
1997 Test A cont.

13

There are **12 pencils** in a box.



A school buys **24 boxes**.



How many **pencils** does the school buy?



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

2 marks

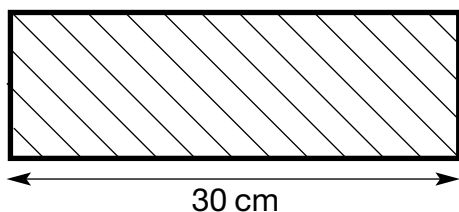
13

Total

1997 Test A cont.

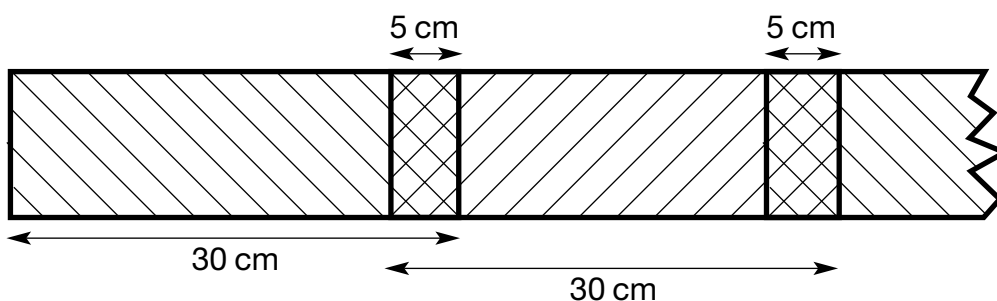
22

Strips of paper are each **30 centimetres** long.



Steve joins strips of paper together to make a **streamer**.

The strips overlap each other by **5 cm**.



How long is a streamer made from **only 2 strips**?


 cm

1 mark

22

Sunita makes a streamer that is **280 cm** long.

How many **strips** does she use?



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

2 marks

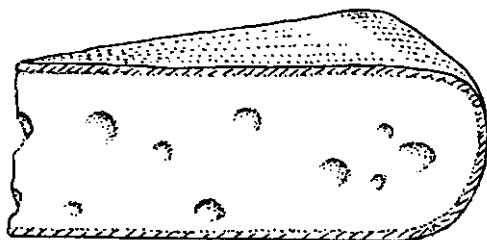
22

Total

1997 Test B

8

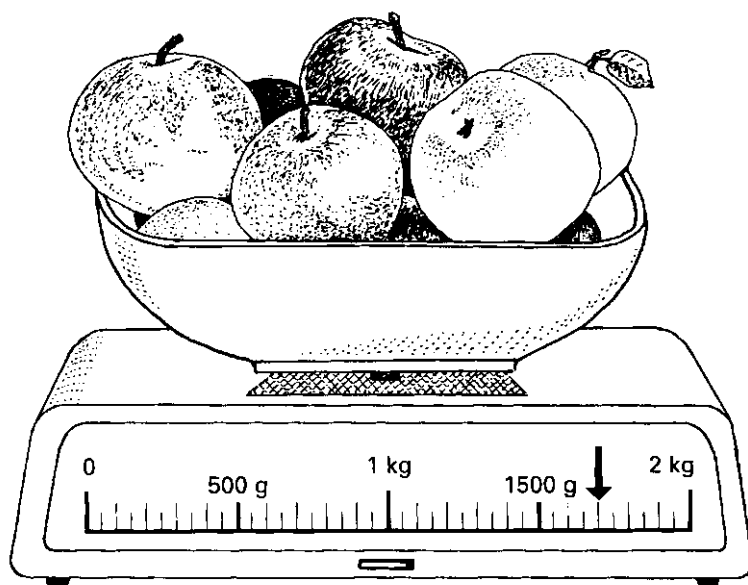
This piece of cheese has a mass of **350 grams**.



Mark an **arrow** (↓) on the scale to show the reading for **350 g**.



Here are some apples.



What is the **total mass** of these apples?



1 mark

8

1 mark

8

Total

1997 Test B cont.

14

Here are the ingredients for fish pie for **two people**.

Fish pie
(for 2 people)

250 g fish
400 g potato
25 g butter

Omar makes fish pie for **3 people**.How many **grams of fish** should he use?

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

g

17

Fill in the **empty boxes** to complete the pattern.

$n + 6$	<div style="border: 1px solid black; width: 100px; height: 40px;"></div>	$7n + 6$
<div style="border: 1px solid black; width: 100px; height: 40px;"></div>	$4n + 3$	$7n + 3$
n	$4n$	<div style="border: 1px solid black; width: 100px; height: 40px;"></div>

14

2 marks

17

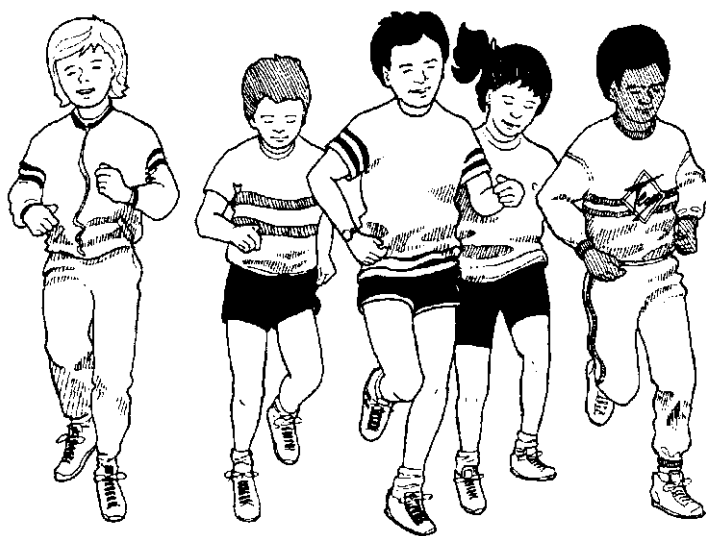
2 marks

Total

1996 Test A

7

Children run a 100 metres race on Sports Day.



Here are their times.

Name	Time taken
Sue	15.97 secs
Jan	16.39 secs
Sam	14.83 secs
Tom	17.00 secs
Raj	15.89 secs

What is the **winner's** time?

secs

7

1 mark

Who has the time **nearest** to 16 seconds?

7

1 mark

Total

1996 Test A cont.

Q7 continued

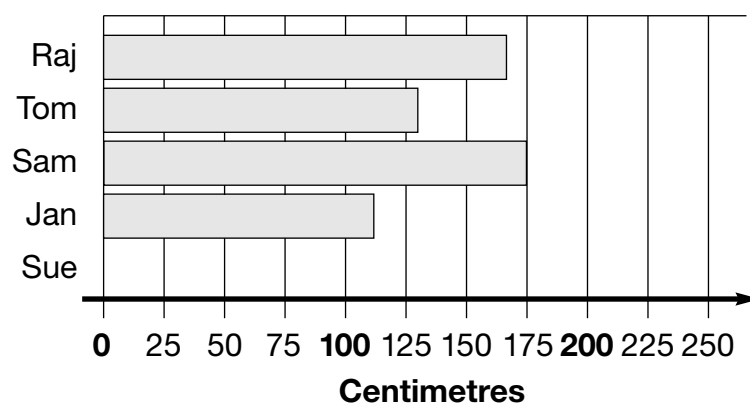
Here are their long jump results.

Sue jumped **212 cm**.

Draw Sue's long jump result on the graph.



Long jump results



Use the graph to estimate how **much further** Sam jumped than Jan.


 cm

12

n stands for a number.

$$n + 7 = 13$$

What is the value of **n + 10**?



Total

7
1 mark

7
1 mark

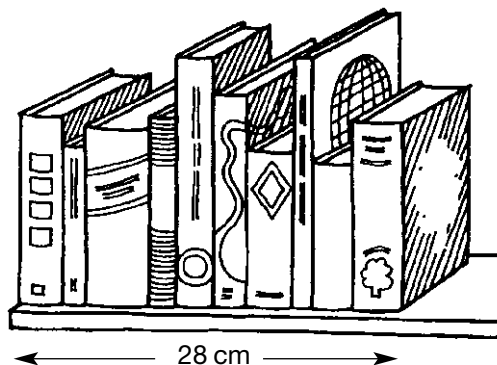
12
1 mark

1996 Test A cont.

16

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

cm

2 marks

16

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**.

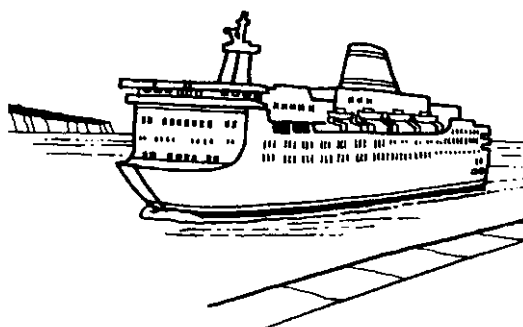


Show
your **working**.
You may get
a mark.

2 marks

16

Total



Fares to France	
Adults	£23.00
Children	£11.50

There are **2 adults** and **3 children** in a family.

How much does it cost the **family** to go on the ferry?



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

On the ferry they change **pounds** for French **francs**.

For every **£1** they get **7 francs**.

How many **francs** do they get for **£150**?



francs

13

2 marks

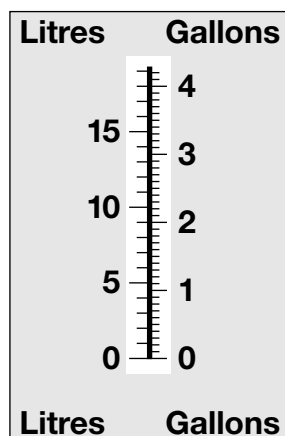
13

1 mark

Total

16

At a petrol station there is a scale for converting litres and gallons.



Approximately how many **litres** are there in **3 gallons**?

Give your answer to the **nearest litre**.



16

1 mark

Approximately how many **gallons** are there in **7 litres**?

Give your answer to **1 decimal place**.



16

1 mark

Total

1996 Test B cont.

10

The rule for this number sequence is

'double and subtract 1'

Write in the **missing** number.



2 → 3 → 5 → 9 →

Here is part of **another** sequence with the **same** rule.

Write in the **missing** number.

→ 13 → 25 → 49

10

1 mark

10

1 mark

19

In a country-dance there are **3 boys** and **2 girls** in every line.



42 boys take part in the dance.

How many **girls** take part?



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

19

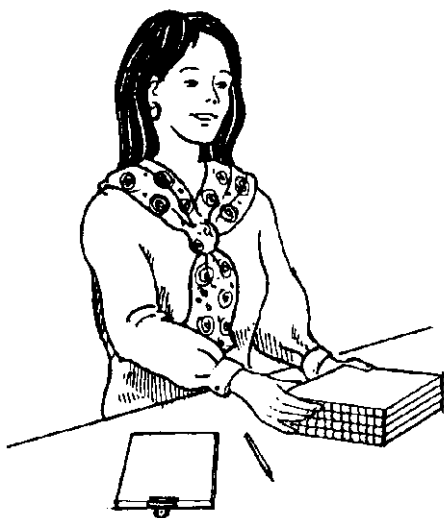
2 marks

Total

1996 Test B cont.

20

Mrs Jones prints books.



PRINT CHARGES

3p per page

75p for the cover

Jon pays **£4.35** for his book, **including the cover**.

How many **pages** are in his book?



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

2 marks

20

Here are the print prices again.

3p per page and 75p for the cover.

Write a formula for the **total cost** of printing a book with cover.

t stands for the total cost in pence.

Use **n** for the number of pages.



t =

2 marks

20

Total