

2016 national curriculum tests

Key stage 1

Mathematics

Paper 1: arithmetic

First name	
Middle name	
Last name	

Total marks	
-------------	--

PRACTICE QUESTION

$3 + 1 =$

1

$8 + 6 =$



1 mark

2

$12 - 7 =$



1 mark

3

$$10 - \boxed{} = 2$$



1 mark

4

$$52 + 7 = \boxed{}$$



1 mark

5

$$4 + 5 + 6 = \boxed{}$$



1 mark

6

$$9 \times 10 = \boxed{}$$



1 mark

7

$3 \times 2 =$



1 mark

8

$50 +$

$= 80$



1 mark

9

$$56 - \boxed{} = 51$$



1 mark

10

$$10 + 40 + 20 = \boxed{}$$



1 mark

11

$$63 - 10 - 10 =$$



1 mark

12

$$8 \times 5 =$$



1 mark

13

$21 + 40 =$



1 mark

14

$8 \div 2 =$



1 mark

15

$$28 + \boxed{} = 35$$



1 mark

16

$$69 + 11 = \boxed{}$$



1 mark

17

$6 \times 3 =$



1 mark

18

$\frac{1}{2} \text{ of } 16 =$



1 mark

19

$$55 + 17 =$$



1 mark

20

$$40 \div 10 =$$



1 mark

21

$$55 \div 5 = \boxed{}$$



1 mark

22

$$\frac{1}{4} \text{ of } 12 = \boxed{}$$



1 mark

23

$$71 - 14 =$$



1 mark

24

$$\frac{1}{3} \text{ of } 30 =$$



1 mark

25

$$\frac{3}{4} \text{ of } 20 = \boxed{}$$



1 mark

END OF TEST



Standards
& Testing
Agency

2016 key stage 1 mathematics

Paper 1: arithmetic

Print version product code: STA/16/7364/p ISBN: 978-1-78315-909-3

Electronic PDF version product code: STA/16/7364/e ISBN: 978-1-78315-910-9

For more copies

Additional printed copies of this booklet are not available. It can be downloaded from www.gov.uk/government/publications.

© Crown copyright and Crown information 2016

Re-use of Crown copyright and Crown information in test materials

Subject to the exceptions listed below, the test materials on this website are Crown copyright or Crown information and you may re-use them (not including logos) free of charge in any format or medium in accordance with the terms of the Open Government Licence v3.0 which can be found on the National Archives website and accessed via the following link: www.nationalarchives.gov.uk/doc/open-government-licence.

When you use this information under the Open Government Licence v3.0, you should include the following attribution: 'Contains public sector information licensed under the Open Government Licence v3.0' and where possible provide a link to the licence.



Exceptions – third-party copyright content in test materials

You must obtain permission from the relevant copyright owners, as listed in the '2016 key stage 1 tests copyright report', for re-use of any third-party copyright content which we have identified in the test materials, as listed below. Alternatively you should remove the unlicensed third-party copyright content and/or replace it with appropriately licensed material.

Third-party content

These materials contain no third-party copyright content.

If you have any queries regarding these test materials contact the national curriculum assessments helpline on 0300 303 3013 or email assessments@education.gov.uk.

2016 national curriculum tests

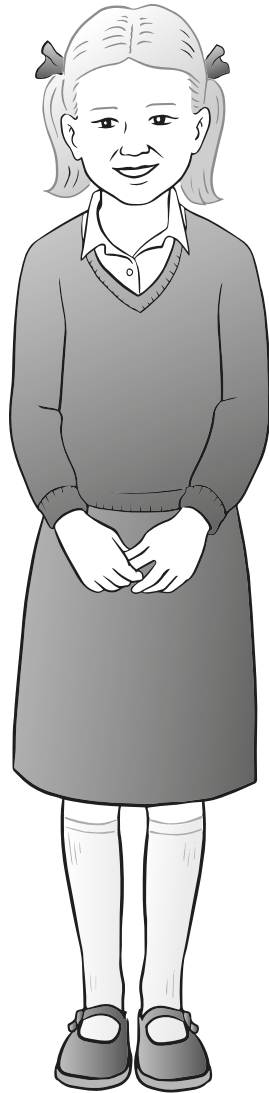
Key stage 1

Mathematics

Paper 2: reasoning

First name	
Middle name	
Last name	

Total marks	
-------------	--



Amy



Abdul

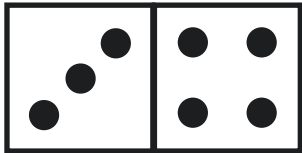
Sam

Ben

Sita

Kemi

Practice question



dots

1

10 10 1 1

10 1 1

10 10 1

10 10 10 1 1

10 1

1 mark

2

children



1 mark

3



1 mark

4

40

7



1 mark

5

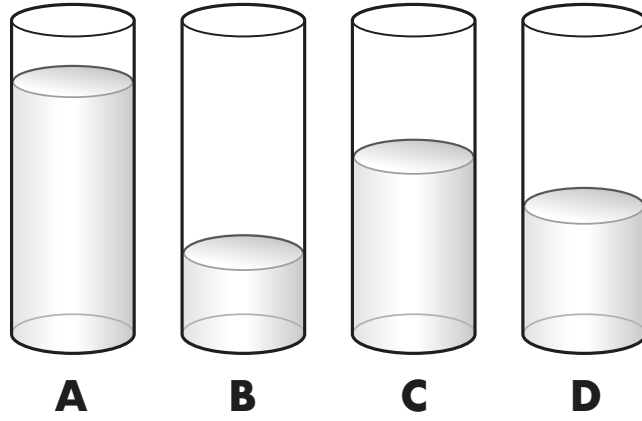
20

30



1 mark

6



Sort the glasses from **least full** to **most full**.



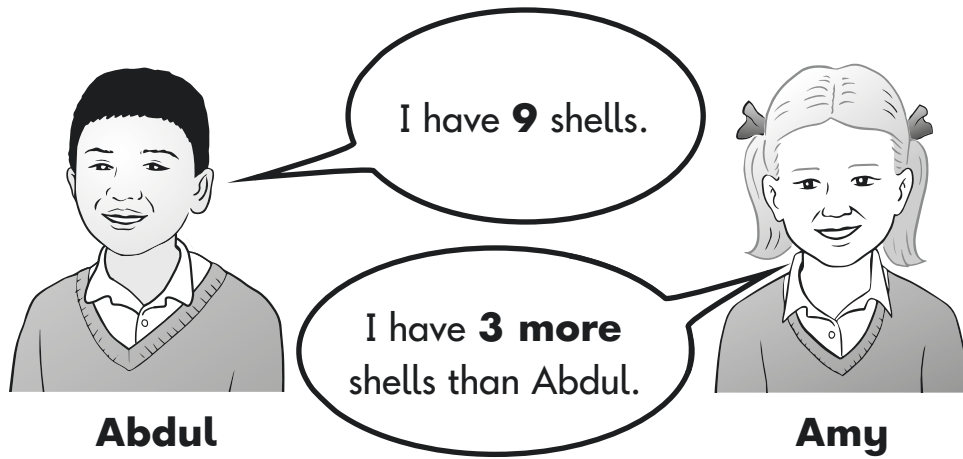
least full



most full



1 mark



How many shells does Amy have?

shells

1 mark

8

Match each coin to the correct box.

One has been done for you.

Less than 	More than 
    	

1 mark

9

On these cards, the word should match the number.

One of these cards is wrong.

Draw a cross on the card that is wrong.

15
fifteen

19
ninety

49
forty-nine

51
fifty-one



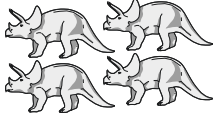
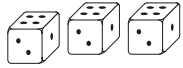
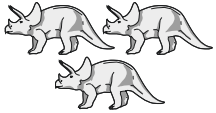
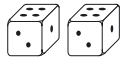
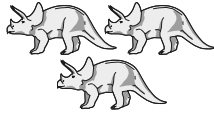
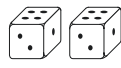
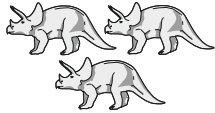
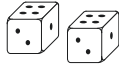
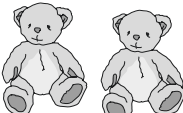
1 mark

10

Ben makes a tally chart of his toys.

Toys in my box	Tally
	
	
	
	

Tick **one** box below that shows all of Ben's toys.

   	   	   	   
--	--	---	--


 1 mark

11 There are **20** balloons.

7 balloons fly away.



How many balloons are left?

balloons



1 mark

12 Tick the **two** sentences that are correct.

Tick **two**.

A square has sides of equal length.

☐

A square has curved sides.

☐

A square has lines of symmetry.

☐

A square has five sides.

☐

1 mark

- 13 Write two numbers to make this calculation correct.

$$\square + \square = 19$$



1 mark

Now write three numbers to make this calculation correct.

$$\square + \square + \square = 19$$

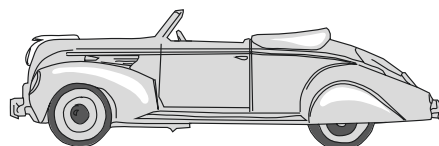


1 mark

- 14 Abdul has some toy cars.

He gives half of them to Ben.

He has four toy cars left.



How many toy cars did Abdul start with?

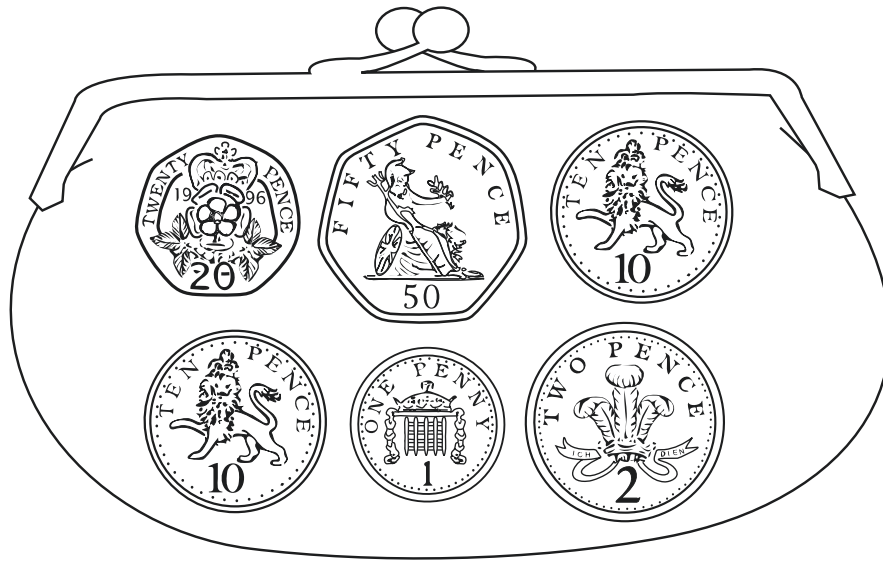
toy cars



1 mark

15

Sita has these coins in her purse.

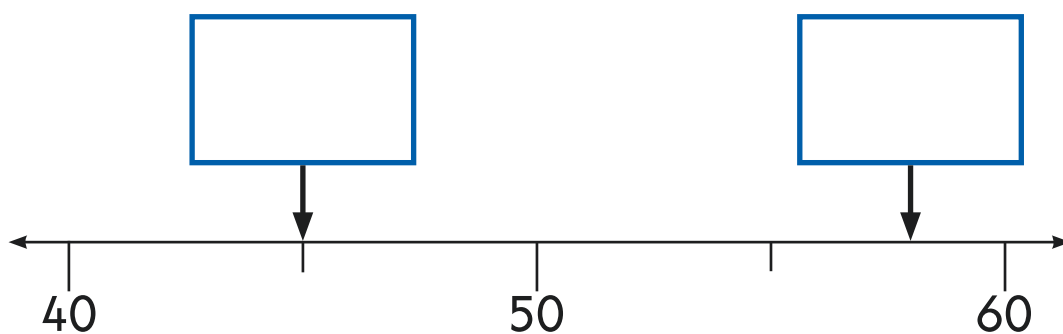


How much money does she have?

p

1 mark

16 Write the correct number in each box.

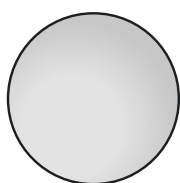


1 mark

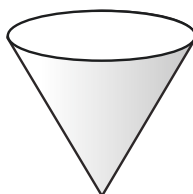


1 mark

17



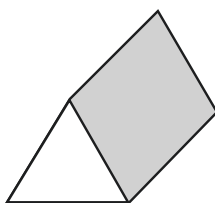
A



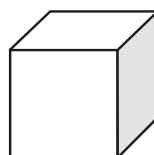
B



C



D



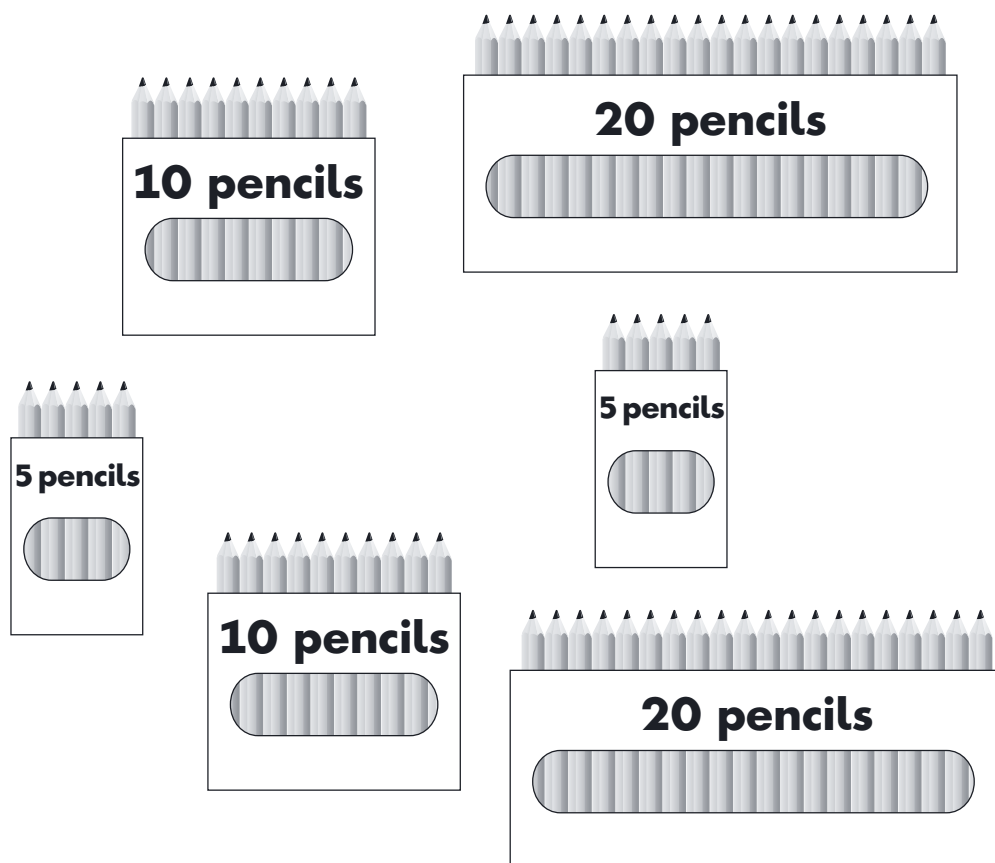
E

Which shape has exactly **5** faces?

Write the letter.



1 mark



Kemi and Ben share these pencils equally.

How many pencils do they each get?

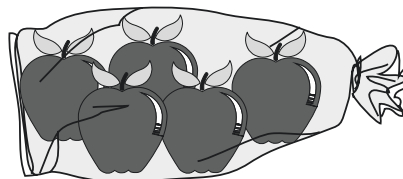
pencils



1 mark

19 Miss Smith needs **30** apples for her class.

There are **5** apples in each bag.



How many **bags** of apples does Miss Smith need altogether?

bags

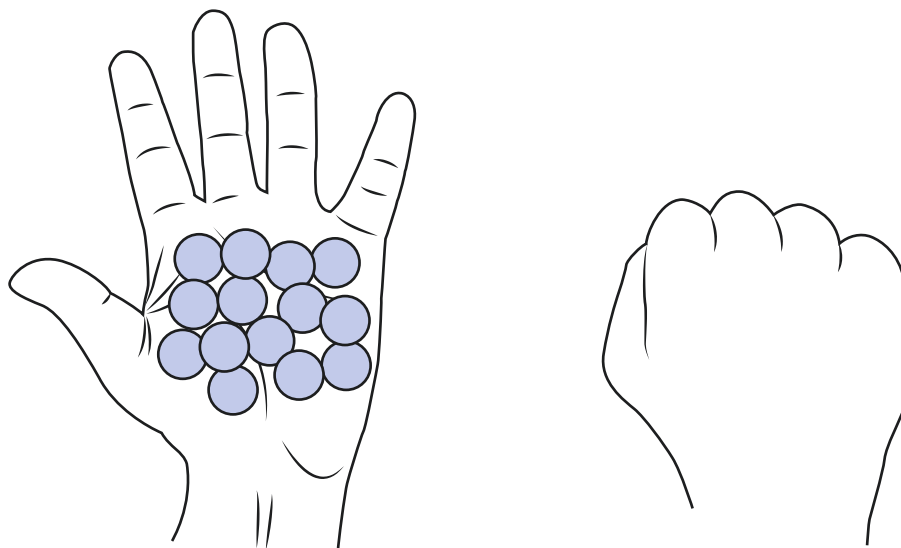


1 mark

20

Amy has **21** counters altogether.

She has **14** counters in one hand.



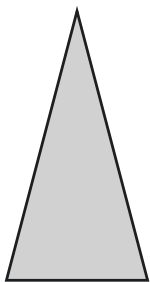
How many counters does she have in the other hand?

counters

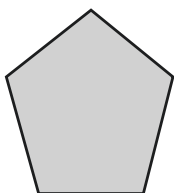


1 mark

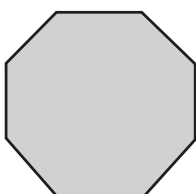
21 Draw lines to match the shapes to their names.



pentagon



triangle



octagon

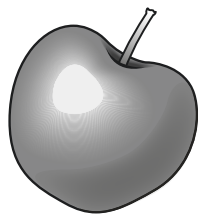
hexagon



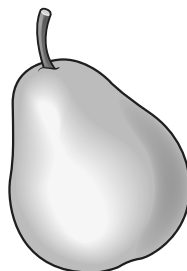
1 mark

22

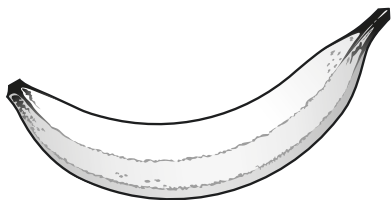
Look at these four fruits.



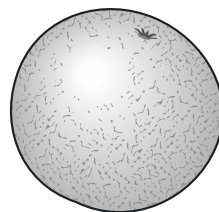
20p



40p



50p



30p

Kemi buys **three different** fruits.

She spends exactly **£1**

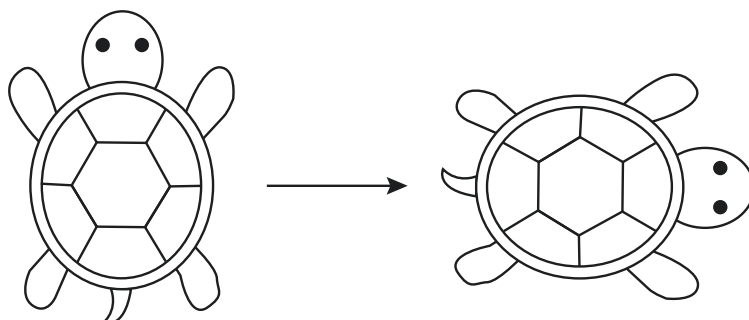
Tick the **three** fruits that she buys.



1 mark

23

This turtle is rotated **clockwise**.



How much is the turtle rotated?

Circle your answer.

quarter
turn

half
turn

three-quarter
turn

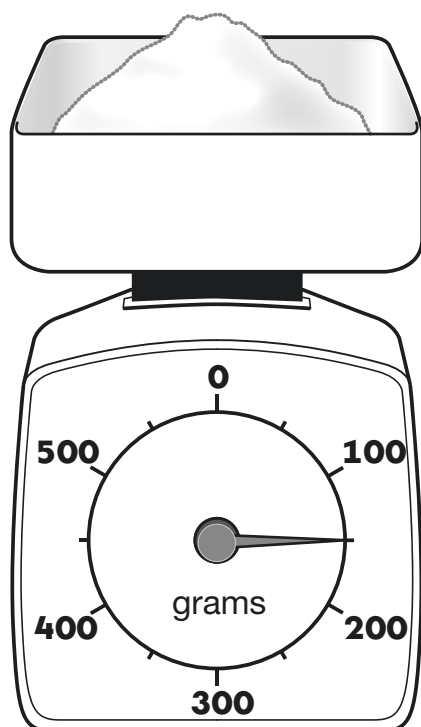
full
turn



1 mark

24

How much does the sugar weigh?


g

1 mark

25

Match the sums that have the same answer.

One is done for you.

$20 + 8$

$30 + 28$

$50 + 8$

$70 + 18$

$80 + 8$

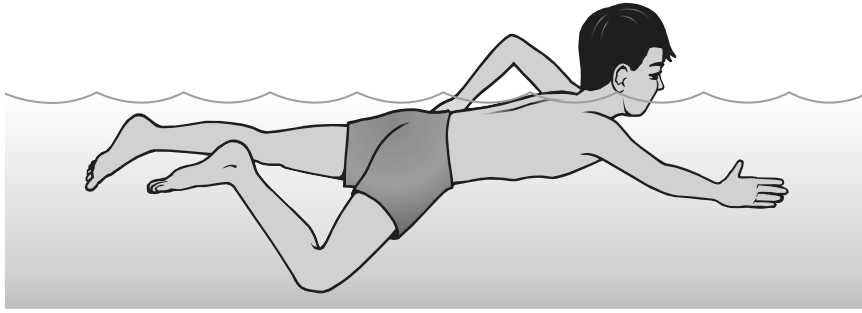
$10 + 18$

$90 + 8$

$50 + 48$



1 mark



One length of a swimming pool is **10** metres.

Abdul swims the length of the pool **4** times.

Abdul works out how many metres he swims altogether.

Circle the **two** calculations that Abdul can use.

$$10 + 4$$

$$4 \times 10$$

$$10 + 10 + 10 + 10$$

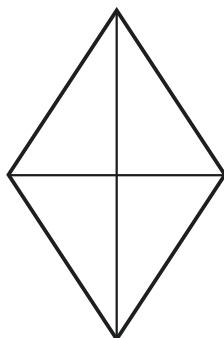
$$4 + 4 + 4 + 4$$



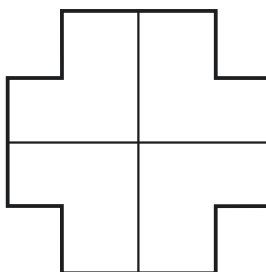
1 mark

27 Shade the fractions of the shapes.

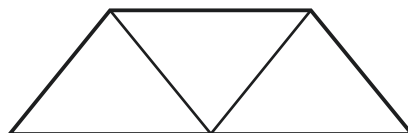
Shade $\frac{1}{2}$



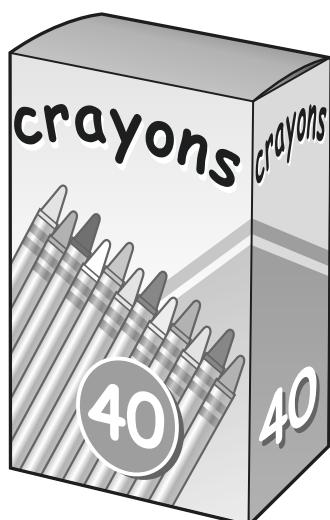
Shade $\frac{3}{4}$



Shade $\frac{1}{3}$



2 marks



There are **40** crayons in a box.

Sam takes **17** crayons.

Kemi takes **10** crayons.

How many crayons are left?

Show
your
working

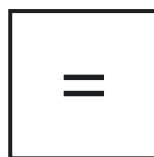
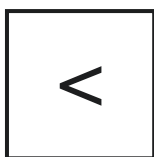
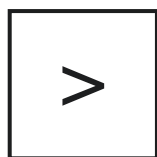
crayons



2 marks

29

Here are some signs.



Write the correct sign in each box.

$10 + 5$

10×5

2×6

$6 + 6$



1 mark

30

Ben has **75** cherries.

He eats **28** of them.

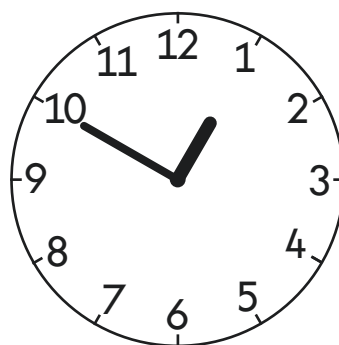
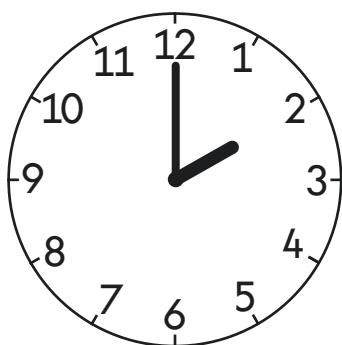
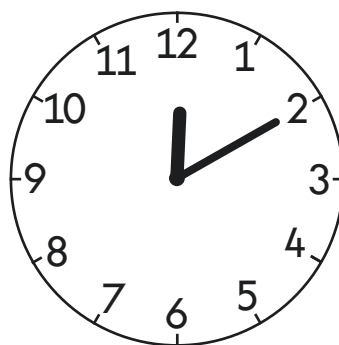
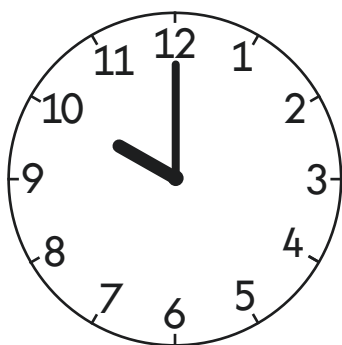
How many cherries does he have left?



1 mark

31

Tick the clock face that shows **ten past twelve**.



1 mark

END OF TEST



Standards
& Testing
Agency

2016 key stage 1 mathematics

Paper 2: reasoning

Print version product code: STA/16/7365/p ISBN: 978-1-78315-911-6

Electronic PDF version product code: STA/16/7365/e ISBN: 978-1-78315-912-3

For more copies

Additional printed copies of this booklet are not available. It can be downloaded from www.gov.uk/government/publications.

© Crown copyright and Crown information 2016

Re-use of Crown copyright and Crown information in test materials

Subject to the exceptions listed below, the test materials on this website are Crown copyright or Crown information and you may re-use them (not including logos) free of charge in any format or medium in accordance with the terms of the Open Government Licence v3.0 which can be found on the National Archives website and accessed via the following link: www.nationalarchives.gov.uk/doc/open-government-licence.

When you use this information under the Open Government Licence v3.0, you should include the following attribution: 'Contains public sector information licensed under the Open Government Licence v3.0' and where possible provide a link to the licence.



Exceptions – third-party copyright content in test materials

You must obtain permission from the relevant copyright owners, as listed in the '2016 key stage 1 tests copyright report', for re-use of any third-party copyright content which we have identified in the test materials, as listed below. Alternatively you should remove the unlicensed third-party copyright content and/or replace it with appropriately licensed material.

Third-party content

These materials contain no third-party copyright content.

If you have any queries regarding these test materials contact the national curriculum assessments helpline on 0300 303 3013 or email assessments@education.gov.uk.

2016 national curriculum tests

Key stage 1

Mathematics

Administering the mathematics test

Paper 2: reasoning

CONFIDENTIAL

This pack must be kept secure and unopened until **Tuesday 3 May 2016**. The pack must not be opened until the pupils are in the test room ready to complete the first administration of the test.

Please ensure you have read and understood the 2016 test administration guidance before opening this pack.

Pack contents:

- An overview of the key stage 1 mathematics: Paper 2: reasoning (overleaf)
- 10 copies of Paper 2: reasoning

For test administration

2016 Key stage 1 mathematics test Paper 2: reasoning

The key stage 1 mathematics test consists of 2 papers. The papers must be administered in order. Pupils do not have to sit both papers on the same day. If both papers are administered on the same day, pupils may benefit from a break between papers. Both papers can be administered to the whole class, smaller groups of pupils or on an individual basis. However, test packs must not be opened until the pupils are in the test room ready to complete the first administration of the test.

Paper 2: reasoning

The following information explains how to administer mathematics Paper 2: reasoning. If you have any questions, you should check with your headteacher or key stage 1 test co-ordinator before you administer the test.

Please make sure you follow these instructions correctly to ensure that the test is properly administered. Failure to administer the test correctly could result in a maladministration investigation at the school.

Format	• This component of the test consists of a single test paper. • It is expected that the reasoning paper will take approximately 35 minutes to complete (not strictly timed). • It is at your discretion to choose when or if pupil(s) require a break during the test or whether, if appropriate, to stop the test early. • The paper includes a practice aural question and 5 aural questions. • After the aural questions, the time for the remainder of the paper should be approximately 30 minutes.
Equipment	Each pupil will need the equipment specified below: • a blue / black pen or a dark pencil • a sharp, dark pencil for mathematical drawing • a ruler (showing centimetres and millimetres) • a rubber (optional). If rubbers are not provided, you should tell pupils that they may cross out any answers they wish to change. Pupils may use the following equipment, if this is normal classroom practice, provided they only give word-for-word translations: • bilingual dictionaries or electronic translators • bilingual word lists • monolingual English electronic spell checkers. Pupils are not allowed the following equipment in the test: • calculators • tracing paper • number apparatus e.g. ten base materials, number squares, number lines etc.
Assistance	• You must ensure that nothing you say or do during the test could be interpreted as giving pupils an advantage, e.g. indicating that an answer is correct or incorrect, or suggesting the pupil looks at an answer again. • If a pupil requests it, a question may be read to the pupil on a one-to-one basis. You can also read questions 6 to 31 if a pupil has difficulty in reading them for themselves. • If reading to a pupil, you can read words and numbers but not mathematical symbols. This is to ensure that pupils are not given an unfair advantage by having the function inadvertently explained by reading its name. • There is no specific hearing impairment guidance for this test, but be careful when signing numbers and mathematical signs. You must ensure you do not convey information that would give pupils an advantage. Guidance for administering the test to pupils with a visual impairment is contained in the modified test packs. • At a pupil's request, you may point to parts of the test paper such as charts, diagrams, statements and equations, but you must not explain the information or help the pupil by interpreting it.

Assistance (continued)	- For this paper there is an optional script for the aural questions, which you can choose to provide to pupils to access this part of the test. The examples below illustrate how to deal with some common situations. Q. What does 'fraction' mean? A. I can't tell you, but think hard and try to remember. We can talk about it after the test. Q. What does '>' or '<' mean? A. I can't tell you, but think hard and try to remember. We can talk about it after the test. - If any everyday context or words related to a question are unfamiliar to a pupil, you may show them related objects or pictures, or describe the related context.
Before the test begins	- Review the list of pupils with any particular individual needs, e.g. pupils who may need to use the optional pupil script for the aural questions, or who may need a scribe or a transcript made at the end of the test. - Ensure that you know how to administer any access arrangements correctly. Please refer to the 2016 key stage 1 access arrangements guidance. - The optional pupil script for the aural questions can be found at the back of this document. Please photocopy it for the pupils that need it. - Check that there are enough administrators to maintain supervision and support for the test. You should consider the possibility of at least one test administrator needing to leave the room with a pupil. - Ensure that you understand how to deal with issues during the tests.
How to deal with issues during the test	It is impossible to plan for every scenario. Whatever action you take, pupil safety must always be your first consideration. In the following circumstances, you will need to stop the test either for an individual pupil or for the whole cohort: - test papers are incorrectly collated or the print is illegible - a fire alarm goes off - a pupil is unwell - a pupil needs to leave the test room during the tests - a pupil is caught cheating. If you need to stop the test: - make a note of the time - make sure pupils are kept under test conditions and that they are supervised - if they have to leave the room, ensure they don't talk about the test - speak to your test co-ordinator or a senior member of staff for advice on what to do next - consider contacting the national curriculum assessments helpline on 0300 303 3013 for further advice. You should brief your headteacher on how the incident was dealt with, once the test is over.
What to do at the start of the test	- Check that seating is appropriately spaced and that no pupil can see another pupil's test paper. - Check that pupils don't have any materials or equipment that may give them extra help. - Check that pupils don't have mobile phones or other disruptive items. - Ensure that each pupil has a copy of mathematics Paper 2: reasoning.

**What to say
at the start
of the test**

It is important to brief pupils fully at the start of each test. You should use these instructions to introduce mathematics Paper 2: reasoning.

The wording of these instructions can be adapted, provided the meaning is retained.

- Explain to the pupils that this is the key stage 1 mathematics Paper 2: reasoning. Tell the pupils that they should have a test booklet in front of them.
- Tell the pupils to write their name on the front of their test booklet.
- Tell the pupils that you will explain how to write answers to each question and that they will have plenty of time to work out the answers.
- Tell the pupils that they must work on their own and they must not call out the answers.
- Tell the pupils, if they want to change an answer, they should put a line through the response they don't want to be marked.
- Explain to the pupils that, if they need to change a diagram or graph, they must ensure they rub out their answer completely before writing a new answer.
- Explain that some questions will have boxes for them to write their answers in and they can do any working out in the white spaces around the boxes, if they need to.
- Where necessary, you can show the pupils how to draw a tick, circle or cross to indicate the answer.
- Ask the pupils to open their test booklet at page 2. Explain that Amy and Abdul are 2 children who are in these questions. Explain that there are different children mentioned in other questions as well. Their names are Sam, Ben, Sita and Kemi.

Introducing the aural questions

- Explain to the pupils that you will read aloud some questions for them to answer. Explain that you will read each question twice only, leaving a short gap in between. Tell the pupils that they must listen very carefully when you read the questions.

(If any pupils are using the optional pupil script to support their access to these 5 questions, you should follow the guidance at the back of this document.)

- Ask the pupils to turn to page 3 of the booklet. Explain that there is a practice question on page 3.
- When reading the question to the pupils, remember to repeat the question.
- Repeat the bold text only.

This is a practice question for us to do together.

(You may help pupils locate the question where necessary.)

Look at the domino.

How many dots does the domino have altogether?

Write your answer in the box.

- Before proceeding, ensure that the pupils know where they should have written their answer and the number they should have written and discuss methods the pupils used to work out their answer. Allow the pupils to change their answers to the correct one by crossing out or rubbing out, to make sure they know how to correct errors.
- Explain to the pupils that you will now read out questions 1 to 5.
- Tell the pupils that they should try to answer all of the questions. They should write their answer in the correct place for that question. (If any pupils are using the optional pupil script, remind them to write their answers in the test booklet and not on the script.)
- Remind the pupils that you can't help them answer these next questions. Tell the pupils that they should try to work them out on their own. If they can't answer a question, they should move onto the next one.
- Ask the pupils if they have any questions they want to ask you before you start.
- Then read questions 1 to 5, allowing time for pupils to write their answers. When reading the question to the pupils, remember to repeat the question. Repeat the bold text only. At the end of each question, allow sufficient time for pupils to complete what they can.

Question 1	Question 1 Circle the correct number of tens and ones to make sixty-three.
Question 2	Turn the page in your booklet and find the answer box for question 2. Question 2 There are eleven girls and twelve boys in a class. How many children are there in total? Write your answer in the box.
Question 3	Question 3 Listen to the number sequence. Zero, three, six, nine... Write the next two numbers in the sequence.
Question 4	Look at the next page and find question 4. Question 4 Three numbers add up to fifty-seven. The first number is forty. The second number is seven. What is the third number? Write your answer in the box.
Question 5	Question 5 Write down <u>all</u> the odd numbers between twenty and thirty. Write them in the box.
What to say after questions 1 to 5	Introducing the written questions • Tell the pupils that for the rest of the test they will need to read the questions in the booklet themselves (teachers may need to amend this instruction if they are supporting some pupils by reading). • Tell the pupils that they must work on their own and they must not call out the answers. • Tell the pupils, if they want to change an answer, they should put a line through the response they don't want to be marked. Additionally, where necessary, you can show the pupils how to change their answers if they think they have made a mistake. • Explain to the pupils that, if they need to change a diagram or graph, they must ensure they rub out their answer completely before writing a new answer. • Where necessary, you can show the pupils how to draw a tick, circle or cross to indicate the answer. • Explain that in some places there will be an answer box. In other places, they may need to write their answer on a diagram or picture. • Explain that they can use the white spaces on the page to do any working out, if they need to. • Tell the pupils that they have approximately 30 minutes to complete the rest of the paper. • Tell the pupils to turn to page 6 and start working.
What to do at the end of the test	• Follow your school's procedure for collecting and storing the pupils' test scripts. • If any pupil needs a transcript, complete it with the pupil at the end of the test, under test conditions. Particular care should be taken to ensure accurate transcriptions are made and pupil's answers are not corrected or amended.
Marking the tests	• Use the key stage 1 test mark schemes to mark the test, following both the general guidance and any specific guidance for each question.

Optional pupil script for the aural questions

2016 Key stage 1 mathematics test Paper 2: reasoning

This is an optional script.

Some pupils may need extra visual support to access the first 5 aural questions of the key stage 1 mathematics reasoning test. The class teacher can provide this optional script to the pupil(s) in addition to their test booklet, if they consider it necessary.

Pupils should use the script alongside their test booklet when listening to the aural questions read by the teacher.

Who is the script for?	The 'optional pupil script' may be used with any pupil who would find it difficult to access and respond to the aural questions and the visual prompts in the test booklet. Before administering the test with the 'optional pupil script', you should consider: • Does the pupil have any needs where providing the 'optional pupil script' alongside the test would improve their access to the aural questions? • You should only use this script with pupils where you are confident that the use of the additional script will not confuse the pupils.
Assistance	• You must adhere to the administration guidelines in the test administration booklet when administering the test. • Pupils using the optional pupil script will need support so that they can manage the script, the test booklet and listen to the teacher appropriately.
Before the test begins	• Make a note of pupils who will have access to the 'optional pupil script' for aural questions. • Make copies of the 'optional pupil script' on the next page, as required. • Provide a copy of the test booklet and the additional 'optional pupil script' to the designated pupils. • Tell the pupils that they should use the script to help them follow the questions as you read them. • Refer to the teacher aural script to administer the aural section of the test.
What to say at the start of the aural questions	• Follow the administration guidance provided in this document. • Tell the pupils to write their name on their optional script as well as their test booklet. • Remind pupils who have the optional script that they should follow each question as you read it aloud. • Explain to pupils that they should record their answers in their test booklet and not on the optional script.
After the aural questions have been administered	• After the last aural question has been read aloud, collect the 'optional pupil scripts'.
Marking the aural questions	Use the key stage 1 test mark schemes to mark the tests, following both the general guidance and any specific guidance for each question. Answers given in the test booklet should take precedence. However if a pupil has written their answer on the optional script and not in the test booklet, teachers should mark accordingly as long as the pupil's answer is not contradicted elsewhere.

2016 key stage 1 mathematics test Paper 2: reasoning
Optional pupil script for the aural questions

You may photocopy the optional pupil script for each pupil who is using it during the administration of the aural questions (1 to 5) of Paper 2. Please refer to the guidance above before using it.

First name	
Middle name	
Last name	

Practice question	Look at the domino. How many dots does the domino have altogether?
Question 1	Circle the correct number of tens and ones to make 63.
Question 2	There are 11 girls and 12 boys in a class. How many children are there in total?
Question 3	0, 3, 6, 9... Write the next two numbers in the sequence.
Question 4	Three numbers add up to 57. The first number is 40. The second number is 7. What is the third number?
Question 5	Write down all the odd numbers between 20 and 30.

2016 key stage 1 mathematics: Administering the mathematics test Paper 2: reasoning
Print version product code: STA/16/7507/PKp ISBN: 978-1-78644-096-9
Electronic version product code: STA/16/7507/PKe ISBN: 978-1-78644-097-6

© Crown copyright and Crown information 2016

Re-use of Crown copyright and Crown information in test materials

Subject to the exceptions listed below, the test materials on this website are Crown copyright or Crown information and you may re-use them (not including logos) free of charge in any format or medium in accordance with the terms of the Open Government Licence v3.0 which can be found on the National Archives website and accessed via the following link: www.nationalarchives.gov.uk/doc/open-government-licence. When you use this information under the Open Government Licence v3.0, you should include the following attribution: 'Contains public sector information licensed under the Open Government Licence v3.0' and where possible provide a link to the licence.

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.



Standards
& Testing
Agency

OGL

2016 national curriculum tests

Key stage 1

Mathematics test mark schemes

Paper 1: arithmetic
and Paper 2: reasoning



Standards
& Testing
Agency

Contents

1. Introduction	3
2. Structure of the key stage 1 mathematics test	3
3. Content domain coverage	4
4. Explanation of the mark schemes	5
5. General marking guidance	5
5.1 Applying the mark schemes	5
5.2 General marking principles	6
6. Internal moderation procedures	7
7. Mark schemes for Paper 1: arithmetic	8
8. Mark schemes for Paper 2: reasoning	9
9. Example responses	17
9.1 Examples of responses from question 5	17
9.2 Examples of responses from question 28	18

1. Introduction

The Standards and Testing Agency (STA) is responsible for the development and delivery of statutory tests and assessments. STA is an executive agency of the Department for Education.

The 2016 tests are the first assessment of the 2014 national curriculum. This test has been developed to meet the specification set out in the test framework for mathematics at key stage 1. The test frameworks are on the GOV.UK website at www.gov.uk/sta.

A new test and mark scheme will be developed each year.

The key stage 1 tests will be marked internally by teachers to inform teacher assessment.

Scaled score conversion tables are not included in this document. Conversion tables will be produced as part of the standard-setting process. Scaled score conversion tables for the 2016 tests will be published at www.gov.uk/sta in June 2016. The standard-setting process will take place in May 2016.

This mark scheme is provided for teachers to use when marking pupils' responses. The pupil examples are based on responses gathered from the test trialling process.

2. Structure of the key stage 1 mathematics test

The key stage 1 mathematics test materials comprise:

- Paper 1: arithmetic (25 marks)
- Paper 2: reasoning (35 marks)

The mathematics test is comprised of two components which are presented to pupils as two separate test papers. The first component is an arithmetic paper (Paper 1). The second component (Paper 2) presents a range of mathematical problems. The test is administered on paper. Each paper includes material drawn from the statutory section of the key stage 1 national curriculum (2014).

3. Content domain coverage

The 2016 test meets the specification set out in the test framework. Table 1 sets out the areas of the content domain that are assessed in the test papers 1 and 2.

The references below are taken from the test framework. A question assessing 2M1, for example, sets out to 'compare and order lengths, mass, volume / capacity and record the results using $>$, $<$ and $=$ ' and is taken from the year 2 programme of study.

Table 1: Content domain coverage of the 2016 key stage 1 mathematics test

Paper 1: arithmetic		Paper 2: reasoning	
Question	Content domain reference	Question	Content domain reference
1	2C1	1	2N3
2	2C1	2	2C4
3	1C4	3	2N1
4	2C2b	4	2C2b
5	2C2b	5	2C6
6	2C6	6	2M1
7	2C6	7	1C4
8	2C3	8	1M3
9	2C3	9	2N2a
10	2C1	10	2S1
11	2N1	11	2C4
12	2C6	12	2G2a
13	2C2b	13a	2C1
14	2C6	13b	2C1
15	2C3	14	2F1a
16	2C2b	15	2M9
17	2C8	16a	2N4
18	2F1a	16b	2N4
19	2C2b	17	2G2b
20	2C6	18	2C4/2C8
21	2C6	19	2C8
22	2F1a	20	2C4
23	2C2b	21	1G1a
24	2F1a	22	2C4
25	2F1a	23	2P2
		24	2M2
		25	2N6
		26	2C7
		27	2F1a
		28	2C4
		29	2N2b
		30	2C4
		31	2M4a

4. Explanation of the mark schemes

The marking information for each question is set out in the form of tables (sections 7 and 8).

The '**Qu.**' column on the left-hand side of each table provides a quick reference to the question number and part.

The '**Mark**' column indicates the total number of marks available for each question part.

The '**Requirement**' column may include two types of information:

- a statement of the requirements for the award of each mark, with an indication of whether credit can be given for a correct method
- examples of some different types of correct answer.

The '**Additional guidance**' column indicates alternative acceptable answers, and provides details of specific types of answers which are unacceptable. Other guidance, such as the range of acceptable answers, is provided as necessary.

5. General marking guidance

5.1 Applying the mark schemes

To help you mark consistently, the most frequent procedural queries are listed along with the action you should take. Unless otherwise specified in the mark scheme, you should apply these guidelines in all cases.

Example responses are also included for the working mark question and one other question in Paper 2: reasoning. This should act as your guide when you are marking these questions.

5.2 General marking principles

Table 2: General marking principles

Possible issues when marking	
1. The pupil's answer does not match closely any of the examples in the mark scheme.	Teachers will use their judgement in deciding whether the answer corresponds with details in the 'Requirement' column of the mark scheme. Refer also to the 'Additional guidance' column and to the examples of responses (where appropriate).
2. The pupil has answered in a non-standard way.	Pupils may provide evidence in any form as long as its meaning can be understood. Diagrams, symbols or words are acceptable for indicating an answer.
3. There appears to be a misread of numbers affecting the working.	A misread occurs when a pupil misreads a number given in the question and consistently uses a different number that does not alter the original intention or difficulty of the question. For example, if '43' is misread as '48', both numbers may be regarded as comparable in difficulty. However, if '43' is misread as '40' or '45', the misread number may be regarded as making the question easier. The misread of a number will affect the award of marks. No marks are awarded if there is more than one misread in a question or if the mathematics is simplified by the misread. For 1-mark questions: no mark is awarded for one or more misreads. For 2-mark questions that have a method mark: 1 mark is awarded if the correct method is correctly implemented with the misread number, provided this does not simplify the mathematics.
4. No answer is given in the expected place, but the correct answer is given elsewhere.	Where a word or number response is expected, a pupil may meet the requirement by annotating a graph or labelling a diagram elsewhere in the question.
5. The pupil's answer is correct but the wrong working is shown.	Always award the mark for a final response that is correct.
6. The answer in the answer box is wrong, but the correct answer is shown in the working.	Give precedence to the response given in the answer box over any other workings. However, in a 2-mark question, one mark may still be awarded for evidence of a complete, correct method.

Possible issues when marking	
7. The pupil's answer correctly follows through from earlier incorrect work.	'Follow through' marks for an answer may only be awarded when specifically stated in the mark scheme.
8. The correct answer has been crossed (or rubbed) out and not replaced.	No marks will be awarded for crossed-out answers or working.
9. More than one answer is given.	If all answers given are correct (or a range of answers are given, all of which are correct), a mark will be awarded unless the mark scheme states otherwise. If both correct and incorrect responses are given, no mark will be awarded unless the mark scheme states otherwise.
10. The pupil reverses a digit in their answer.	A reversed digit is acceptable if it is clearly recognisable as the digit intended; for example, a reversed 2 must clearly show the characteristics of a 2 rather than a 5. As a further example, where the answer is '61' and the response 'ø1' is given, then this should be awarded the mark. You should take a decision based upon your knowledge of the child's writing.
11. The pupil transposes digits in their answer.	A pupil transposes digits by reversing their order e.g. '83' instead of '38'. An answer with transposed digits should not be awarded the mark; for example, a response of '16' or '1ø' when the answer is '61' should not be marked as correct.

6. Internal moderation procedures

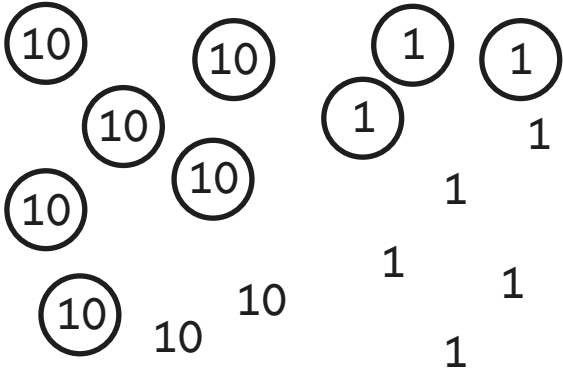
We recommend teachers involved in marking the key stage 1 tests undertake moderation activity to ensure marking is consistent across their school. Guidance is published on the GOV.UK website at www.gov.uk/sta.

7. Mark schemes for Paper 1: arithmetic

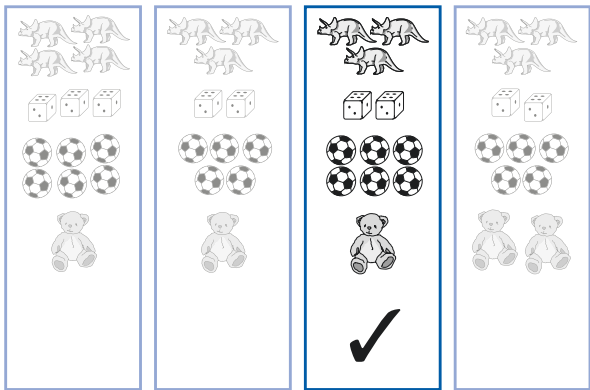
Equivalent answers are **not** acceptable e.g. $10 + 4$ instead of 14

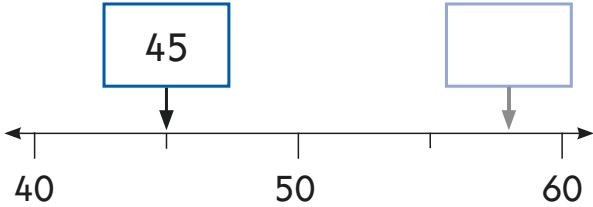
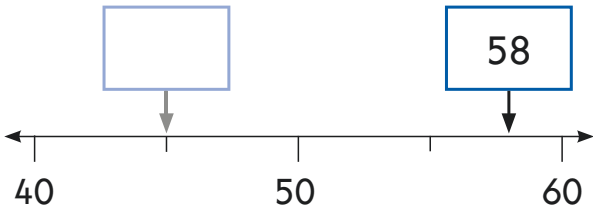
Qu.	Requirement	Mark	Additional guidance
P	4	none	Practice question
1	14	1m	
2	5	1m	
3	8	1m	
4	59	1m	
5	15	1m	
6	90	1m	
7	6	1m	
8	30	1m	
9	5	1m	
10	70	1m	
11	43	1m	
12	40	1m	
13	61	1m	
14	4	1m	
15	7	1m	
16	80	1m	
17	18	1m	
18	8	1m	
19	72	1m	
20	4	1m	
21	11	1m	
22	3	1m	
23	57	1m	
24	10	1m	
25	15	1m	

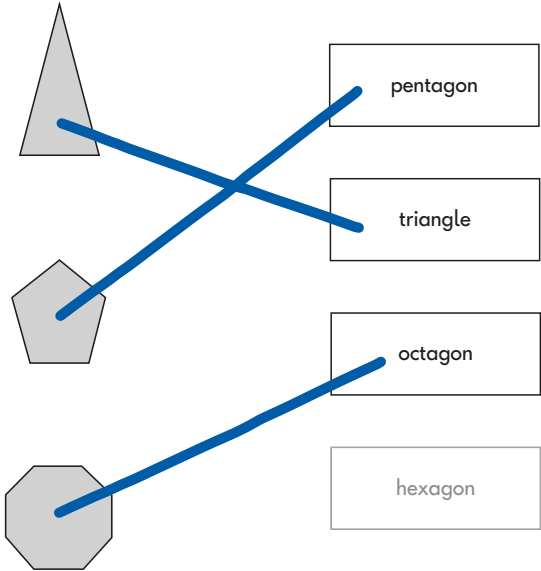
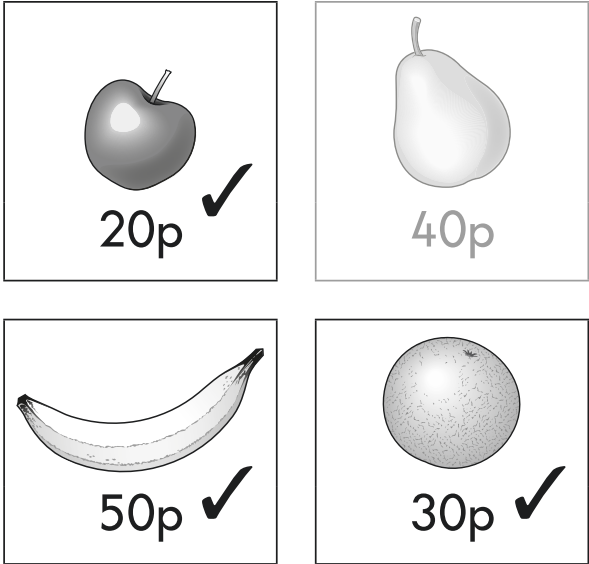
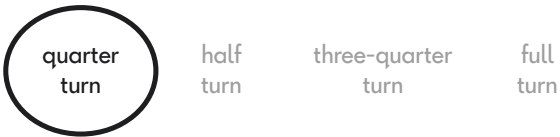
8. Mark schemes for Paper 2: reasoning

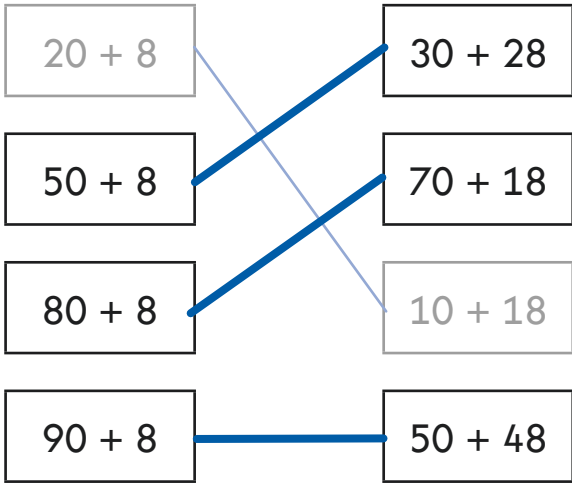
Qu.	Requirement	Mark	Additional guidance
Aural questions			
P	7 (dots)	none	Practice question
1	6 tens and 3 ones circled, e.g. 	1m	Accept any other clear way of indicating the correct answer.
2	23 (children)	1m	
3		1m	Accept correct numbers in either order. Accept both answers given in one of the boxes. (Refer to general marking principles 4, 10 and 11 on pages 6 and 7)
4	10	1m	
5	21, 23, 25, 27, 29	1m	All five numbers must be correct for the award of the mark. Accept repeated correct numbers e.g. 21, 23, 23, 25, 27, 29 Numbers may be written in any order. Do not award the mark if additional incorrect numbers are written inside the answer box. (Use the examples of responses given on page 17 to help you determine if the mark can be awarded.)

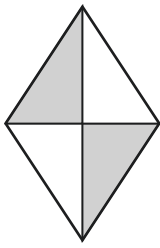
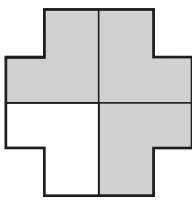
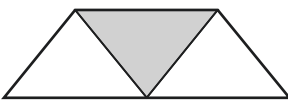
Qu.	Requirement	Mark	Additional guidance
Written questions			
6	Letters written in the correct order as shown: B least full D C A most full	1m	All letters must be in the correct order for the award of the mark. Accept any other clear way of indicating the correct answer e.g. matching each glass to the correct box. Accept the letters given in the reverse order, provided the labels have been swapped.
7	12 (shells)	1m	
8	Coins matched to the correct boxes as shown: Less than       More than  <i>(Handwritten blue lines show matches: 5p to Less than, 1p to More than, 2p to Less than, 10p to Less than, 50p to More than)</i>	1m	All four coins must be matched correctly for the award of the mark. Accept any other clear way of indicating the correct answer. Do not award the mark if a coin is matched to both boxes.

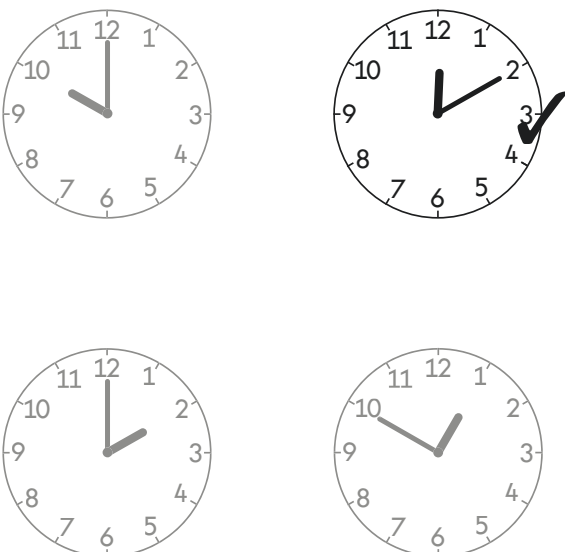
Qu.	Requirement	Mark	Additional guidance
9	Card indicated as shown: 	1m	Accept any other clear way of indicating the correct answer. Do not award the mark if other cards are indicated unless it is clear the correct card is the child's final choice.
10	Third box ticked as shown: 	1m	Accept any other clear way of indicating the correct box. Do not award the mark if other boxes are indicated unless it is clear that the correct box is the child's final choice.
11	13 (balloons)	1m	
12	Two sentences ticked as shown: A square has sides of equal length. ☒ A square has curved sides. ☐ A square has lines of symmetry. ☒ A square has five sides. ☐	1m	Both correct sentences must be indicated for the award of the mark. Accept any other clear way of indicating the correct sentences. Do not award the mark if other sentences are indicated unless it is clear that the correct sentences are the child's final choice.

Qu.	Requirement	Mark	Additional guidance
13a	Two numbers written that total 19 , e.g. 10 + 9 = 19 16 + 3 = 19 19 + 0 = 19	1m	Accept any two numbers that total 19
13b	Three numbers written that total 19 , e.g. 10 + 4 + 5 = 19 5 + 5 + 9 = 19	1m	Accept any three numbers that total 19, including repeated numbers, e.g. 19 + 0 + 0
14	8 (toy cars)	1m	
15	93 (p)	1m	Accept the answer £0.93p Do not award the mark for 0.93p or £93p
16a	45 written in the first box as shown: 	1m	(Refer to general marking principles 4, 10 and 11 on pages 6 and 7)
16b	58 written in the second box as shown: 	1m	Accept any number in the range 57–59 inclusive . (Refer to general marking principles 4, 10 and 11 on pages 6 and 7)
17	D	1m	Accept any other clear way of indicating the correct shape.
18	35 (pencils)	1m	Do not accept the correct number of pencils indicated, unless the answer 35 is also seen.
19	6 (bags)	1m	

Qu.	Requirement	Mark	Additional guidance
20	7 (counters)	1m	Do not accept seven counters drawn unless the answer 7 is also seen. (Refer to general marking principle 4 on page 6)
21		1m	All shapes must be correctly matched for the award of the mark. Do not award the mark if a shape is matched to more than one name. Ignore any additional shapes drawn.
22	Three correct fruits ticked as shown: 	1m	Accept any other clear way of indicating the correct fruits shown on the page e.g. $50p + 20p + 30p = 100p$ or £1 (Refer to general marking principle 4 on page 6)
23	Correct answer circled as shown: 	1m	Accept any other clear way of indicating the correct rotation. Do not award the mark if other rotations are indicated unless it is clear that the correct answer is the child's final choice.
24	150 (g)	1m	

Qu.	Requirement	Mark	Additional guidance
25		1m	All three pairs must be correctly matched for the award of the mark. Do not award the mark if a sum is matched to more than one sum. Ignore any extra lines drawn from $20 + 8$
26	Both calculations circled as shown: $10 + 4$ 4×10 $10 + 10 + 10 + 10$ $4 + 4 + 4 + 4$	1m	Both correct calculations must be indicated for the award of the mark. Accept any other clear way of indicating the correct calculations, including evaluating only the correct two calculations, i.e. writing 40 alongside each of the two correct calculations. Do not award the mark if other calculations have been evaluated, and the correct two have not been indicated. Do not award the mark if more than two calculations are circled unless it is clear that the correct calculations are the child's final choice.

Qu.	Requirement	Mark	Additional guidance
27	Award TWO marks for all shapes correctly shaded e.g. Shade $\frac{1}{2}$  Shade $\frac{3}{4}$  Shade $\frac{1}{3}$  Award ONE mark for any two shapes correctly shaded.	2m or 1m	Accept any other clear way of indicating the correct fractions; e.g. marking the appropriate number of sections.
28	Award TWO marks for the correct answer of 13 (crayons) If the answer is incorrect or missing, award ONE mark for evidence of a complete, correct method, e.g. • $40 - 17 - 10 =$ (incorrect or no answer) • $17 + 10 = 26$ (error) $40 - 26 =$	2m or 1m	(Use the examples of responses given on pages 18-21 to help you determine how many marks can be awarded.)
29	Both signs written correctly as shown: $10 + 5$ $<$ 10×5 2×6 $=$ $6 + 6$	1m	Both signs must be correct for the award of the mark. Accept slight inaccuracies in the drawing of the signs, as long as the intention is clear.
30	47 (cherries)	1m	

Qu.	Requirement	Mark	Additional guidance
31	Clock face ticked as shown: 	1m	Accept any other clear way of indicating the correct clock face. Do not award the mark if other clock faces are indicated unless it is clear that the correct clock face is the child's final answer.

9. Example responses

9.1 Examples of responses from question 5

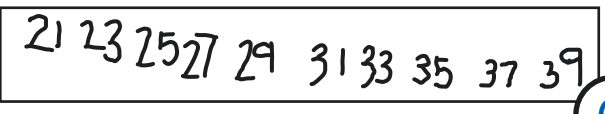
Children must show all of the numbers **21**, **23**, **25**, **27** and **29** for the award of the mark. No other numbers must be given as part of the child's final answer.

Ling: 1 mark



Handwritten response for Ling: 21 23 25 27 29. The numbers are written in a box, and a circled '1' is next to the box.

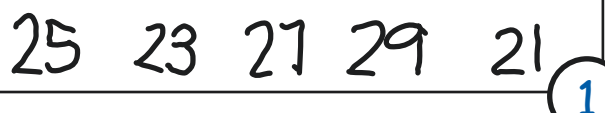
Aaron: 0 marks



Handwritten response for Aaron: 21 23 25 27 29 31 33 35 37 39. The numbers are written in a box, and a circled '0' is next to the box.

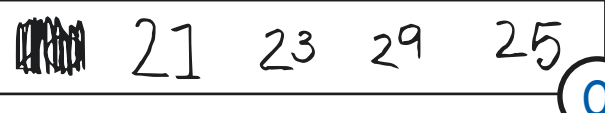
Ling and **Aaron** have both written the correct five numbers in the answer space. **Ling** has not offered any other numbers so **one mark** can be awarded. **Aaron** has written other numbers so his answer is not correct and **no mark** can be awarded.

Kalila: 1 mark



Handwritten response for Kalila: 25 23 27 29 21. The numbers are written in a box, and a circled '1' is next to the box.

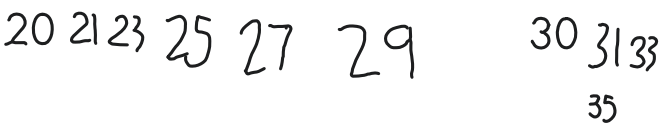
Umed: 0 marks



Handwritten response for Umed: 21 23 29 25. The numbers are written in a box, and a circled '0' is next to the box.

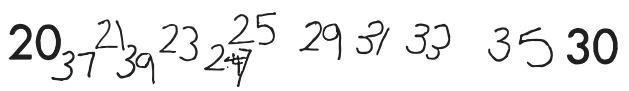
Kalila and **Umed** have both written correct numbers in the answer space. **Kalila** has written the correct five numbers in a random order and has not offered any other numbers so **one mark** can be awarded. **Umed** has only written four of the five numbers, so his answer is not fully correct and **no mark** can be awarded.

Liam: 1 mark



Handwritten response for Liam: 20 21 23 25 27 29 30 31 33 35. The numbers are written in a box, and a circled '1' is next to the box.

Narinder: 0 marks



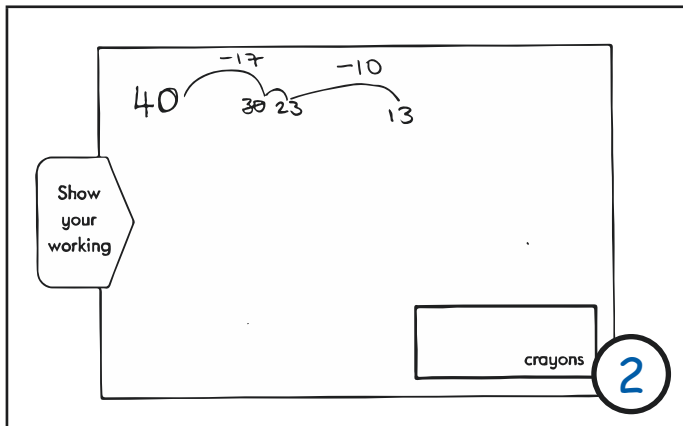
Handwritten response for Narinder: 20 21 23 25 29 31 33 35 30. The numbers are written in a box, and a circled '0' is next to the box.

Liam and **Narinder** have both left the answer box blank, but offered their responses elsewhere on the page. **Liam** shows the correct five numbers clearly. Although additional numbers are seen, they are not between the 20 and 30 and can be ignored. **One mark** can be awarded. Although **Narinder** shows the correct five numbers, she has also written other numbers between the 20 and 30 making her final answer incorrect, so **no mark** can be awarded.

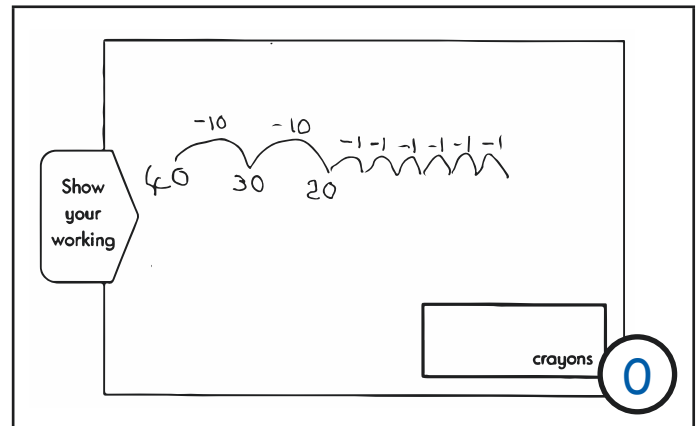
9.2 Examples of responses from question 28

Children must show a complete, correct method for the award of the method mark. The working may contain one or more arithmetic errors.

Peter: 2 marks

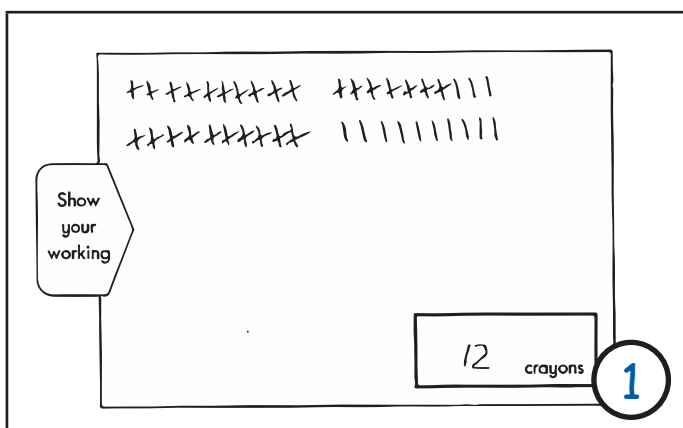


Alia: 0 marks

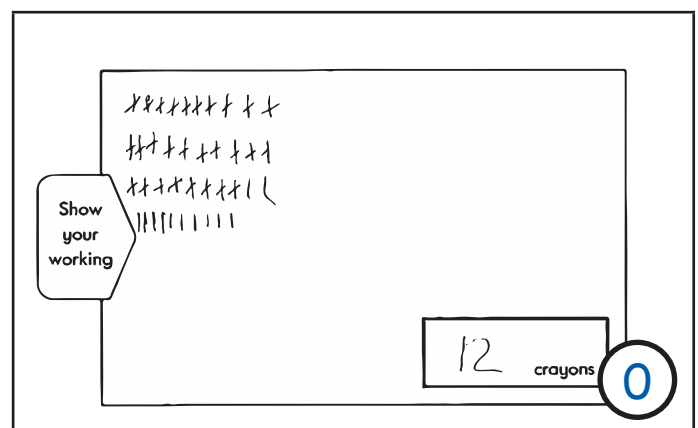


Both **Peter** and **Alia** have used a number line to solve the problem. **Peter** has been awarded **two marks** because he has shown the correct final answer of 13 even though it is not within the answer box. **Alia** has recorded an incorrect method. She has used a number line, but after subtracting two tens she has only subtracted 6 instead of 7, so **no mark** can be awarded.

Esne: 1 mark



Nicky: 0 marks



Esne and **Nicky** have used pictorial methods and both have shown the incorrect answer '12'. **Esne** has recorded a correct pictorial method, showing 40 tallies and crossing off 27, i.e. $40 - 17 - 10$, but has made an error in counting the remaining tallies. Because her method is correct, **Esne** can be awarded **one mark**. **Nicky** has also recorded a pictorial method. She has shown 40 tallies, but has crossed off 28 so her method is not correct and **no mark** can be awarded.

Examples of responses from question 28 continued

Shay: 1 mark

Show your working

$$40 - 17 - 10 = 13$$

13 crayons

1

Charlie: 0 marks

Show your working

13 crayons

0

Shay and **Charlie** have both transposed digits in the final answer so two marks cannot be awarded. In **Shay's** working, 17 can be considered a reversal of a digit because the 17 is clearly seen in the question. Consequently her method ($40 - 17 - 10 =$) is complete and correct and can be awarded **one mark**. In his answer box, **Charlie** may be trying to write 13, but transposed digits are not acceptable. Since he has not shown any working, **no mark** can be awarded.

Alex: 1 mark

Show your working

$$40 - 17 - 10 =$$

~~13~~ crayons

1

Erin: 0 marks

Show your working

$$40 - 17 = 30$$

$$30 - 10 =$$

crayons

0

Alex and **Erin** have both crossed out some of their work. **Alex** has written the correct answer but has crossed it out and has not replaced it. However, he can be awarded **one mark** for a complete, correct method. In comparison, **Erin** had a complete method (albeit with an arithmetic error and no final answer) but she crossed out the second part ($30 - 10$) resulting in an incomplete method so **no mark** can be awarded.

Examples of responses from question 28 continued

Arnav: 1 mark

Arnav's response shows the calculation $40 - 27 =$ written inside a box. To the left of the box is a label 'Show your working'. Below the box is a label 'crayons' and a circle containing the number 1.

Oliwa: 0 marks

Oliwa's response shows the calculation $40 - 22$ written inside a box. To the left of the box is a label 'Show your working'. Below the box is a label 'crayons' and a circle containing the number 0.

Arnav and **Oliwia** both recorded a calculation but did not complete it. Even though the first part of **Arnav's** method is not visible, we can assume that he has added 17 and 10 as he shows the total 27 being subtracted from 40 in the written part of his method. **One mark** can be awarded for a complete, correct method, despite the omission of a final answer. **Oliwia** has not shown the addition of 17 and 10, so it is not clear where her '22' has come from. We are not able to assume that she has a correct method so **no mark** can be awarded.

Harry: 1 mark

Harry's response shows the calculation $17 + 10 = 27$ written inside a box. Above the 27 is a small '3' and a '40' with a cross through it. Below the 27 is a horizontal line and the number 12. To the left of the box is a label 'Show your working'. Below the box is a label '12 crayons' and a circle containing the number 1.

Lucia: 0 marks

Lucia's response shows the calculation $10 + 17 = 26$ written inside a box. Below this is the calculation $26 - 40 = 26$. To the left of the box is a label 'Show your working'. Below the box is a label '26 crayons' and a circle containing the number 0.

Harry and **Lucia** both added 10 and 17 and then attempted a subtraction. **Harry** has subtracted 27 from 40 so **one mark** can be awarded for a complete, correct method. **Lucia** made an arithmetic error when adding 10 and 17 to reach 26. This arithmetic error need not affect the method mark, but **Lucia** went on to subtract 40 from 26 which is an incorrect method. Consequently **no mark** can be awarded. (If **Lucia** had reached the answer of 14, we would assume that she intended to subtract 26 from 40, and **one mark** would be awarded for a complete, correct method.)

Examples of responses from question 28 continued

Anna: 1 mark

Show your working

$$40 - 20 = 20 - 7 =$$

crayons

1

Leroy: 0 marks

Show your working

~~$$40 - 17 - 10 =$$~~

crayons

0

Anna and **Leroy** both recorded a calculation with no final answer. **Anna** shows a complete, correct method of $40 - 27$ so **one mark** can be awarded. **Leroy** also recorded a complete, correct method of $40 - 17 - 10$, but has crossed it out so **no mark** can be awarded.

Tom: 1 mark

Show your working

$$40 - 19 = 21$$

$$21 - 10 = 11$$

11 crayons

1

Fleur: 0 marks

Show your working

$$40 - 10 - 10 = 20$$

20 crayons

0

Tom and **Fleur** have both misread numbers in the question. **Tom** has misread 17 as 19. As all the arithmetic is correct and the question has not been made easier, **one mark** can be awarded for the method. **Fleur** has misread 17 as 10 and subtracted 10 twice. As her misread makes the question easier, **no mark** can be awarded.

[BLANK PAGE]

This page is intentionally blank.

[BLANK PAGE]

This page is intentionally blank.



Standards
& Testing
Agency

2016 key stage 1 mathematics test mark schemes

Paper 1: arithmetic and Paper 2: reasoning

Print PDF version product code: STA/16/7366/p ISBN: 978-1-78315-913-0

Electronic PDF version product code: STA/16/7366/e ISBN: 978-1-78315-914-7

For more copies

Additional printed copies of this booklet are not available. It can be downloaded from www.gov.uk/government/publications.

© Crown copyright and Crown information 2016

Re-use of Crown copyright and Crown information in test materials

Subject to the exceptions listed below, the test materials on this website are Crown copyright or Crown information and you may re-use them (not including logos) free of charge in any format or medium in accordance with the terms of the Open Government Licence v3.0 which can be found on the National Archives website and accessed via the following link: www.nationalarchives.gov.uk/doc/open-government-licence. When you use this information under the Open Government Licence v3.0, you should include the following attribution: 'Contains public sector information licensed under the Open Government Licence v3.0' and where possible provide a link to the licence.



Exceptions – third-party copyright content in test materials

You must obtain permission from the relevant copyright owners, as listed in the '2016 key stage 1 tests copyright report', for re-use of any third-party copyright content which we have identified in the test materials, as listed below. Alternatively you should remove the unlicensed third-party copyright content and/or replace it with appropriately licensed material.

Third-party content

These materials contain no third-party copyright content.

If you have any queries regarding these test materials contact the national curriculum assessments helpline on 0300 303 3013 or email assessments@education.gov.uk.