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KEY STAGE

2

LEVELS

3-5

Mathematics tests

Mark schemes

Test A, Test B and
mental mathematics

2012

National curriculum assessments

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2012 Key Stage 2 mathematics mark schemes

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Marking the mathematics tests

The Standards and Testing Agency (STA) is responsible for the development and delivery of statutory tests and assessments in 2012. STA is an executive agency of the Department for Education (DfE). The test papers will be marked by external markers employed by the external marking agency under contract to STA. The markers will follow the mark schemes in this booklet, which is supplied to teachers for information.

This booklet contains the mark schemes for the levels 3–5 tests A, B and mental mathematics. Level threshold tables will be available at www.education.gov.uk/KS2 from 10 July 2012.

General guidance

The structure of the mark schemes

The marking information for each question is set out in the form of tables, which start on page 6 of this booklet.

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

The '**Mark**' column indicates the total number of marks available for each question part. On some occasions the symbol (U1) may be shown in the 'Mark' column. The 'U' indicates that there is a *Using and applying mathematics* element in the question. The number, 1, shows the number of marks attributed to using and applying mathematics in this question.

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 correct working
- examples of some different types of correct response.

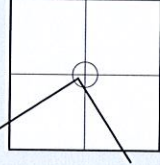
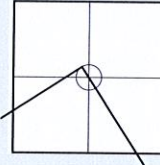
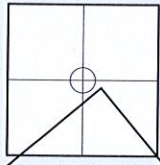
The '**Additional guidance**' column indicates alternative acceptable responses, and provides details of specific types of response which are unacceptable. Other guidance, such as the range of acceptable answers, is provided as necessary.

Additionally, for the mental mathematics test, general guidance on marking is given on page 18, followed by the marking information for each question.

Applying the mark schemes

In order to ensure consistency of marking, the most frequent procedural queries are listed on pages 2 and 3 along with the action the marker will take. This is followed by further guidance on pages 4 and 5 relating to the marking of questions that involve money, time and other measures. Unless otherwise specified in the mark scheme, markers will apply the following guidelines in all cases.

What if...	Marking procedure	
<i>The pupil's response is numerically or algebraically equivalent to the answer in the mark scheme.</i>	Markers will award the mark unless the mark scheme states otherwise.	
<i>The pupil's response does not match closely any of the examples given.</i>	Markers will use their judgement in deciding whether the response corresponds with the statement of the requirements given in the 'Requirement' column. Reference will also be made to the additional guidance and, if there is still uncertainty, markers will contact the supervising marker.	
<i>The pupil has responded in a non-standard way.</i>	Calculations, formulae and written responses do not have to be set out in any particular format. Pupils may provide evidence in any form as long as its meaning can be understood. Diagrams, symbols or words are acceptable for explanations or for indicating a response. Any correct method of setting out working, however idiosyncratic, will be accepted.	
<i>There appears to be a misreading affecting the working.</i>	This is when the pupil misreads the information given in the question and uses different information without altering the original intention or difficulty level of the question. For each misread that occurs, one mark only will be deducted. In one-mark questions – 0 marks are awarded. In two-mark questions that have a method mark – 1 mark will be awarded if the correct method is correctly implemented with the misread number.	
<i>No answer is given in the expected place, but the correct answer is given elsewhere.</i>	Where a pupil has shown understanding of the question, the mark(s) will be given. In particular, 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.	
<i>The pupil's answer is correct but the wrong working is shown.</i>	A correct response will always be marked as correct.	
<i>The response in the answer box is wrong, but the correct answer is shown in the working.</i>	<p>Where appropriate, detailed guidance will be given in the mark scheme, which markers will follow. If no guidance is given, markers will examine each case to decide whether:</p> <ul style="list-style-type: none"> ■ the incorrect answer is due to a transcription error ■ the pupil has continued to give redundant extra working which does not contradict work already done ■ the pupil has continued to give redundant extra working which does contradict work already done. 	<p>If so, the mark will be awarded.</p> <p>If so, the mark will be awarded.</p> <p>If so, the mark will not be awarded.</p>

What if...	Marking procedure
<i>The correct response has been crossed out and not replaced.</i>	Any legible crossed-out work that has not been replaced will be marked according to the mark scheme. If the work is replaced, then crossed-out work will not be considered.
<i>More than one answer is given.</i>	If all answers are correct (or a range of answers is given, all of which are correct), the mark will be awarded unless prohibited by the mark scheme. If both correct and incorrect responses are given, no mark will be awarded.
<i>The answer is correct but, in a later part of the question, the pupil has contradicted this response.</i>	A mark given for one part will not be disallowed for working or answers given in a different part, unless the mark scheme specifically states otherwise.
<i>The pupil has drawn lines which do not meet at the correct point.</i>	<p>Markers will interpret the phrase 'slight inaccuracies in drawing' to mean 'within or on a circle of radius 2mm with centre at the correct point'.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>within the circle accepted</p> </div> <div style="text-align: center;">  <p>on the circle accepted</p> </div> <div style="text-align: center;">  <p>outside the circle not accepted</p> </div> </div>

Recording marks awarded on the test paper

In the margin there is a marking space alongside each question part.

For the mental mathematics test, the external marker will record '1' for a correct response or '0' otherwise.

For the written tests, the external marker will record one of the following in each marking space:

- '1' for a correct response
- '0' for an incorrect response
- '-' if no response is made.

A two-mark question which is correct will have '1' entered in both marking spaces. A two-mark question which is incorrect, but which has sufficient evidence of working or method as required by the mark scheme, will have '1' entered in the first marking space and '0' in the second. Otherwise '0' will be entered in both marking spaces, unless no response is made, in which case '-' will be entered in both marking spaces.

For the written tests, the total number of marks gained on each double page will be written in the space at the bottom of the right-hand page. For all of the tests, the total number of marks gained on each paper will be recorded on the front of the test paper.

Test A carries a total of 40 marks. Test B also carries a total of 40 marks. The mental mathematics test carries a total of 20 marks.

The 2012 Key Stage 2 mathematics tests and mark schemes were developed by the Test Development Team at Pearson Research and Assessment on behalf of STA.

Marking specific types of question – summary of additional guidance

Responses involving money

	Accept	Do not accept
<p>Where the £ sign is given</p> <p>for example: £3.20, £7</p> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">£</div>	<p>£3.20 £7 £7.00</p> <p>Any unambiguous indication of the correct amount, eg</p> <p>£3.20p £3 20 pence £3 20 £3,20 £3-20 £3:20</p>	<p>Incorrect placement of pounds or pence, eg</p> <p>£320 £320p</p> <p>Incorrect placement of decimal point, or incorrect use or omission of 0, eg</p> <p>£3.2 £3 200 £32 0 £3-2-0</p>
<p>Where the p sign is given</p> <p>for example: 40p</p> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">p</div>	<p>40p</p> <p>Any unambiguous indication of the correct amount, eg</p> <p>£0.40p</p>	<p>Incorrect or ambiguous use of pounds or pence, eg</p> <p>0.40p £40p</p>
<p>Where no sign is given</p> <p>for example: £3.20, 40p</p> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 5px;"></div>	<p>£3.20 40p 320p £0.40</p> <p>Any unambiguous indication of the correct amount, eg</p> <p>£3.20p £0.40p £3 20 pence £.40p £3 20 £.40 £3,20 40 £3-20 0.40 £3:20 3.20 320 3 pounds 20</p>	<p>Incorrect or ambiguous use of pounds or pence, eg</p> <p>£320 £40 £320p £40p £3.2 0.4 3.20p 0.40p</p>

Responses involving time

	Accept	Do not accept
A time interval <i>for example:</i> 2 hours 30 minutes	2 hours 30 minutes Any unambiguous, correct indication, eg $2\frac{1}{2}$ hours 2.5 hours 2h 30 2h 30 min 2 30 150 minutes 150 Digital electronic time, ie 2:30	Incorrect or ambiguous time interval, eg 2.30 2-30 2,30 230 2.3 2.3 hours 2.3h 2h 3 2.30 min
A specific time <i>for example:</i> 8:40am, 17:20	8:40am 8:40 twenty to nine Any unambiguous, correct indication, eg 08.40 8.40 0840 8 40 8-40 8,40 Unambiguous change to 12 or 24 hour clock, eg 17:20 as 5:20pm or 17:20pm	Incorrect time, eg 8.4am 8.40pm Incorrect placement of separators, spaces, etc or incorrect use or omission of 0, eg 840 8:4:0 8.4 084

Responses involving measures

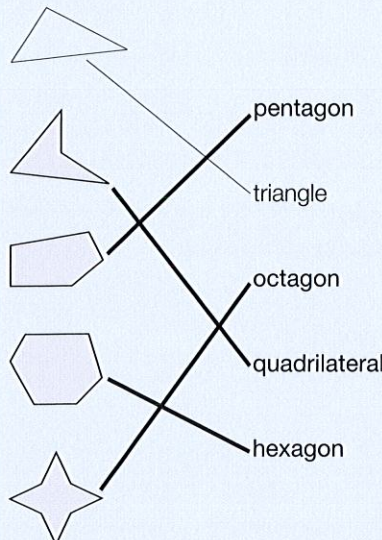
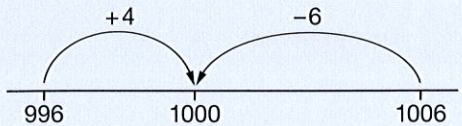
	Accept	Do not accept
Where units are given <i>(eg kg, m, l)</i> <i>for example:</i> 8.6kg <div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-top: 5px;">kg</div>	8.6kg Any unambiguous indication of the correct measurement, eg 8.60kg 8.6000kg 8kg 600g	Incorrect or ambiguous use of units, eg 8600kg

Note

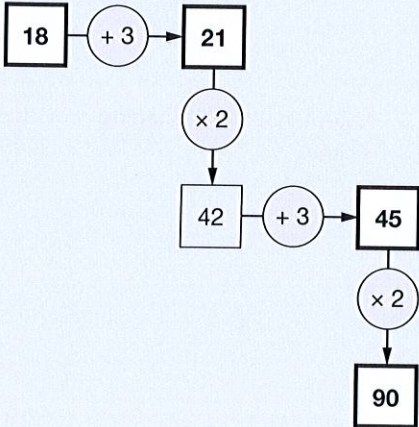
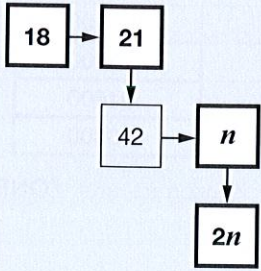
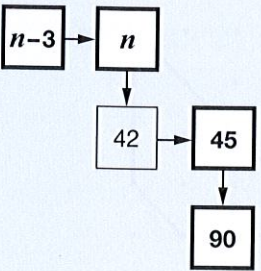
If a pupil leaves the answer box empty but writes the answer elsewhere on the page, then that answer must be consistent with the units given in the answer box and the conditions listed above.

If a pupil changes the unit given in the answer box, then their answer must be equivalent to the correct answer using the unit they have chosen, unless otherwise indicated in the mark scheme.

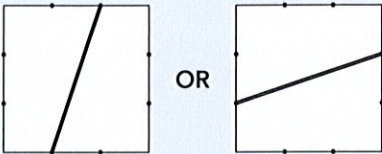
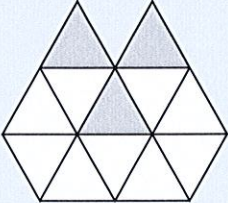
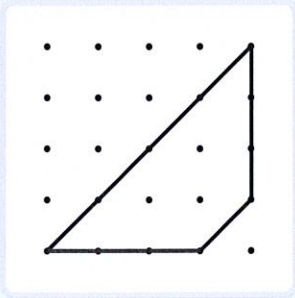
Test A questions 1–3

Question	Requirement	Mark	Additional guidance
1	<p>Award TWO marks for four shapes correctly matched as shown:</p>  <p>If the answer is incorrect, award ONE mark for at least two shapes correctly matched.</p>	Up to 2m	<p>Lines need not touch shapes or names, provided the intention is clear.</p> <p>Do not credit any shape which has been matched to more than one name.</p>
2	<p>Prices in order, as shown:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">£2.50</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">£20.05</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">£20.50</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">£25</div> </div>	1m	<p>Accept use of equivalent units, eg 2050p.</p> <p>Accept answers with missing or incorrect units.</p>
3	<p>996 circled, and an explanation that it is closer in value than 1006 to 1000, eg:</p> <ul style="list-style-type: none"> ■ '996 is 4 less than 1000, but 1006 is 6 more' ■ '1000 - 996 = 4, 1006 - 1000 = 6' ■ 'It's closer by 2' ■  ■ 'Both end in 6 which means to the nearest ten they round up. So 996 rounds up to 1000, but 1006 rounds up to 1010' ■ '1006 is nearer 1010, but 996 is nearer 1000' ■ '996 is only 4 away'. 	<p>1m</p> <p style="text-align: center; border: 1px solid black; border-radius: 50%; width: 30px; margin: 0 auto;">U1</p>	<p>No mark is awarded for circling 996 alone.</p> <p>Do not accept vague or incomplete explanations, eg:</p> <ul style="list-style-type: none"> ■ '1006 is further away' ■ '996 is less than 1000, but it is still closer than 1006' <p>If 996 is not circled, but a correct, unambiguous explanation is given, then award the mark.</p>

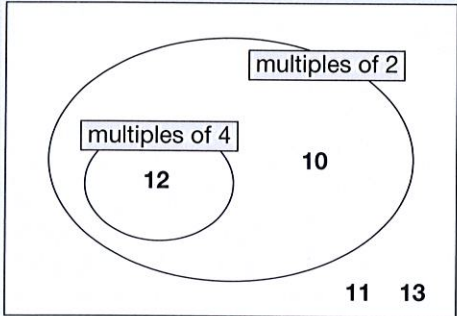
Test A questions 4–5

Question	Requirement	Mark	Additional guidance
4a	<p>Award TWO marks for the correct answer of 26</p> <p>If the answer is incorrect, award ONE mark for evidence of appropriate working, eg:</p> <ul style="list-style-type: none"> ■ $12 + 25 + 17 = 54$ <li style="padding-left: 20px;">$80 - 54 = \text{wrong answer}$ <p>OR</p> <ul style="list-style-type: none"> ■ $80 - 12 - 25 - 17 = \text{wrong answer}$ 	Up to 2m	Working must be carried through to reach an answer for the award of ONE mark.
4b	£6	1m	
5	<p>Award TWO marks for all four numbers correct as shown:</p>  <p>If the answer is incorrect, award ONE mark for three numbers correct.</p>	Up to 2m	<p>If the answer is incorrect, award ONE mark for two numbers correct AND two numbers appropriately linked, ie</p>  <p>OR</p>  <p>where n is any number.</p>

Test A questions 6–11

Question	Requirement	Mark	Additional guidance										
6a	2	1m	Accept Seb AND Mina.										
6b	Seb AND Kirsty AND Jack	1m	Names may be given in any order. Accept unambiguous abbreviations or recognisable misspellings. Do not accept 3										
7	216	1m											
8	Dots joined to divide square into two congruent parts, eg 	1m U1	Accept slight inaccuracies in drawing (see page 3 for guidance). Accept more than one answer if all are correct.										
9	Diagram completed to show three triangles shaded, or equivalent, eg 	1m	Accept inaccurate shading provided the intention is clear.										
10	Award TWO marks for three numbers correct as shown: <table border="1"> <thead> <tr> <th></th> <th>rounded to the nearest hundred</th> </tr> </thead> <tbody> <tr> <td>316</td> <td>300</td> </tr> <tr> <td>3162</td> <td>3200</td> </tr> <tr> <td>31628</td> <td>31600</td> </tr> <tr> <td>316281</td> <td>316300</td> </tr> </tbody> </table> If the answer is incorrect, award ONE mark for two numbers correct.		rounded to the nearest hundred	316	300	3162	3200	31628	31600	316281	316300	Up to 2m	
	rounded to the nearest hundred												
316	300												
3162	3200												
31628	31600												
316281	316300												
11	Diagram completed as shown: 	1m	Accept inaccurate drawing provided the intention is clear.										

Test A questions 12–16

Question	Requirement	Mark	Additional guidance
12a	Award TWO marks for the correct answer of £2.63 If the answer is incorrect, award ONE mark for evidence of appropriate working, eg $82p \times 2 = 164p$ $66p + 33p = 99p$ $164p + 99p = \text{wrong answer}$	Up to 2m	Accept for ONE mark £263 OR £263p as evidence of appropriate working. Working must be carried through to reach an answer for the award of ONE mark.
12b	300	1m	
13a	C	1m	Accept 18
13b	D	1m	
14	24	1m	
15	D B C A	1m	Accept alternative unambiguous indications of the correct order, eg 7:30 7:45 7:54 7:56
16	Award TWO marks for all four numbers correctly placed as shown:  If the answer is incorrect, award ONE mark for three numbers correctly placed.	Up to 2m	Accept alternative unambiguous indications, eg lines drawn from the numbers to the appropriate regions of the diagram. Do not accept numbers written in more than one region.

Test A questions 17–19

Question	Requirement	Mark	Additional guidance
17	160	1m U1	
18	<p>Award TWO marks for the correct answer of 15680</p> <p>If the answer is incorrect, award ONE mark for evidence of appropriate working which contains no more than ONE arithmetical error, eg:</p> <ul style="list-style-type: none"> long multiplication algorithm, eg $\begin{array}{r} 560 \\ \times 28 \\ \hline 11200 \\ 4480 \\ \hline \end{array}$ <p>wrong answer</p> grid method, eg $\begin{array}{r rr} & 500 & 60 \\ 20 & 10000 & 1200 \\ 8 & 4000 & 480 \\ \hline & & = \text{wrong answer} \end{array}$ partitioning method, eg $\begin{array}{l} 560 \times 10 = 5600 \\ 560 \times 10 = 5600 \\ 560 \times 8 = 4480 \\ \hline \end{array}$ <p>wrong answer</p> factorisation method, eg $\begin{array}{l} 560 \times 7 = 3920 \\ 3920 \times 4 = \text{wrong answer} \end{array}$ 	Up to 2m	<p>In all cases accept follow through of ONE error in working.</p> <p>Do not award any marks if:</p> <ul style="list-style-type: none"> the error is in the place value, eg the omission of the zero when multiplying by two tens, eg $\begin{array}{r} 560 \\ \times 28 \\ \hline 1120 \\ 4480 \\ \hline \end{array}$ <p>wrong answer</p> the final (answer) line of digits is missing. <p>Variations on algorithms are acceptable, provided they represent viable and complete methods.</p> <p>Working must be carried through to reach an answer for the award of ONE mark.</p>
19	<p>Award TWO marks for all five letters in the correct order as shown:</p> <p>B E C D A</p> <p>If the answer is incorrect, award ONE mark for at least three letters correct.</p>	Up to 2m	<p>Accept alternative unambiguous indications, eg</p>

Test A questions 20–21

Question	Requirement	Mark	Additional guidance
20a	8	1m	
20b	14	1m U1	If the answer to 20a is 14 AND the answer to 20b is 8, then award ONE mark for 20b.
21	<p>Award TWO marks for the correct answer of</p> <p>Mina 14 Kirsty 9 Seb 7</p> <p>If the answer is incorrect, award ONE mark for:</p> <ul style="list-style-type: none"> ■ two numbers correct <p>OR</p> <ul style="list-style-type: none"> ■ 14 AND 9 AND 7 with some or all attributed to the wrong child <p>OR</p> <ul style="list-style-type: none"> ■ evidence of appropriate working, eg $30 - 5 + 2 = 27$ Kirsty = $27 \div 3 =$ wrong answer Mina = wrong answer + 5 Seb = wrong answer - 2 <p>OR</p> <ul style="list-style-type: none"> ■ a 'trial and improvement' method, eg $10 + 5 + 3 = 18$ $20 + 15 + 13 = 48$ $15 + 10 + 8 = 33$ 	Up to 2m U1	<p>Working must be carried through to reach an answer for the award of ONE mark.</p> <p>A 'trial and improvement' method must show evidence of improvement, but a final answer need not be reached for the award of ONE mark.</p>

Test B questions 17–22

Question	Requirement	Mark	Additional guidance
17	<p>Award TWO marks for the correct answer of 80</p> <p>If the answer is incorrect, award ONE mark for evidence of appropriate method, eg:</p> <ul style="list-style-type: none"> ■ $60 \div 3 = 20$ 20×4 <p>OR</p> <ul style="list-style-type: none"> ■ 3 red 4 white 30 red 40 white 60 red... 	Up to 2m	Answer need not be obtained for the award of ONE mark.
18	10	1m	
19a	Answer in the range 125cm inclusive to 140cm exclusive	1m	Do not accept 140cm.
19b	Answer in the range 9:30am to 9:50am inclusive	1m	Accept an answer in the range 4:30pm to 4:50pm inclusive.
20a	AB BC CD DA	1m	Accept alternative unambiguous indications of the correct lines.
20b	AB BC CD DA	1m	Accept alternative unambiguous indications of the correct lines.
21	6.3	1m	
22	<p>Award TWO marks for the correct answer of £1.75</p> <p>If the answer is incorrect, award ONE mark for evidence of appropriate method, eg:</p> <ul style="list-style-type: none"> ■ $40 \div 4.25 = 9.411\dots$ $4.25 \times 9 = 38.25$ $40 - 38.25$ <p>OR</p> <ul style="list-style-type: none"> ■ 10 yo-yos cost £42.50 9 yo-yos cost $\text{£}42.50 - \text{£}4.25 = \text{£}38.25$ $\text{£}40 - \text{£}38.25$ 	Up to 2m	<p>Accept for ONE mark £175 OR £175p OR 1.75p as evidence of appropriate method.</p> <p>Accept for ONE mark sight of £38.25 OR 38.25 OR 3825</p> <p>Answer need not be obtained for the award of ONE mark.</p>

Test B questions 23–25

Question	Requirement	Mark	Additional guidance
23	Two numbers where the value of k is four times the value of j , eg When j is <input type="text" value="5"/> then k is <input type="text" value="20"/> OR When j is <input type="text" value="11"/> then k is <input type="text" value="44"/>	1m	
24	(75, 36)	1m	Accept unambiguous answers written on the diagram.
25	An explanation which gives a counter-example to illustrate that two odd numbers and an even number can total 50, eg: ■ '46 + 1 + 3 = 50' ■ '20 + 15 + 15 works' ■ '5 and 20 and 25' OR an explanation which recognises that two of the numbers could be odd, eg: ■ 'You could use two odd numbers to make 10, and then add 40' ■ 'Two of the numbers could be 1 and 3' ■ 'Odd + odd + even = even'.	1m U1	No mark is awarded for circling 'No' alone. Do not accept vague or incomplete explanations, eg: ■ 'You can't divide it by 3' ■ 'Odd + odd = even'. If 'Yes' is circled but a correct, unambiguous explanation is given, then award the mark.

Mark scheme for the mental mathematics test

Applying the mark scheme

Please note that pupils will not be penalised if they record any information given in the question or show their working. Markers will ignore any annotation, even if in the answer space, and mark only the answer. Markers will accept an unambiguous answer written in the stimulus box, or elsewhere on the page.

Full mark scheme information is given on page 20. In addition, a 'quick reference' mark scheme is provided on page 19. This is presented in a similar format to the pupil's answer sheet.

General guidance

The general guidance for marking the written tests also applies to marking the mental mathematics test. In addition, the following principles apply.

1. Unless stated otherwise in the mark scheme, accept answers written in words, or a combination of words and figures.
2. Where units are specified, they are given on the answer sheet. Pupils are not penalised for writing in the units again.
3. Where answers are required to be ringed, do not accept if more than one answer is ringed, unless it is clear which is the pupil's intended answer. Accept also any other way of indicating the correct answer, eg underlining.

Mental mathematics 2012

quick reference mark scheme

Practice question

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Time: 5 seconds

1	72
---	----

2	10:30
---	-------

3	6
---	---

4	75
---	----

5	100
---	-----

Time: 10 seconds

6	118
---	-----

7	£ 5
---	-----

8	15
---	----

9	500 m
---	-------

10	150	Do not accept 150%
----	-----	-----------------------

11	
	£ 16

12	$6\frac{1}{2}$ OR 6.5
----	-----------------------

13	0.09 0.89 0.1
	1.2 1.19

14	80 °
----	------

15	36	Accept 6 ²
----	----	-----------------------

Time: 15 seconds

16	250
----	-----

17	£ 1
----	-----

18	256
----	-----

19	-5	Do not accept 5-
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20	31 33 35 37 39
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Mental mathematics questions 1–20

Question	Requirement	Mark	Additional guidance
1	72	1m	
2	10:30	1m	The answer is a specific time (see page 5 for guidance).
3	6	1m	
4	75	1m	
5	100	1m	
6	118	1m	
7	£5	1m	
8	15	1m	
9	500m	1m	
10	150	1m	Do not accept 150%
11	£16	1m	
12	$6\frac{1}{2}$ OR 6.5	1m	
13	0.09 0.89 0.1 1.2 1.19	1m	Accept alternative unambiguous indications, eg number ticked, crossed or underlined.
14	80°	1m	
15	36	1m	Accept 6^2
16	250	1m	
17	£1	1m	
18	256	1m	
19	-5	1m	Do not accept 5 –
20	31 33 35 37 39	1m	Accept alternative unambiguous indications, eg numbers ticked, crossed or underlined.

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STA/12/5581 (Mark schemes pack)