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KEY STAGE 3

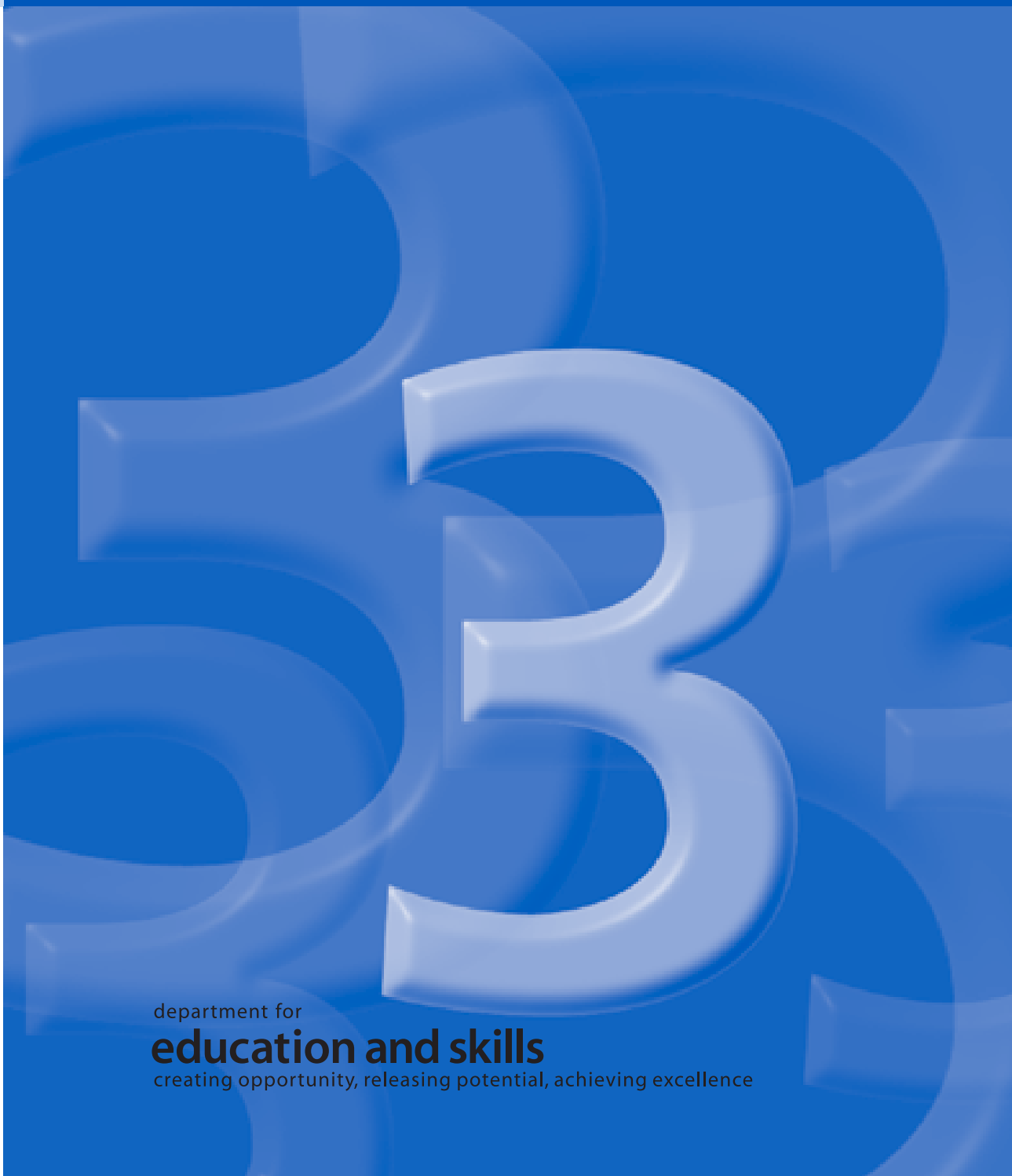
LOWER TIER & HIGHER TIERS

2004

Mathematics tests

Mark schemes for Mental mathematics Tests A, B and C

2004



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Introduction

This booklet contains the mark schemes for the higher tiers tests (Tests A and B) and the lower tier test (Test C). The pupil answer sheets will be marked by external markers who will follow the mark schemes in this booklet, which are provided here for teachers' reference.

General guidance for markers

Please note that pupils should not be penalised if they record any information given in the question or show their working. Ignore any annotation, even if in the answer space, and mark only the answer. Accept an unambiguous answer written in the stimulus box, or elsewhere on the page, but clearly attributable to the relevant question.

General guidance for marking the written tests also applies to marking the mental mathematics tests. In addition, please apply the following principles unless specific instructions to the contrary are given in the mark scheme:

- accept responses in words and/or figures,
  eg 7 point 3, 4 hundred;

- accept any unambiguous indication of the correct response from a given list,
  eg circling, ticking, underlining;

- accept unambiguous misspellings;

- accept units that have been correctly converted to a different unit provided the new unit is indicated. Where units have been given on the answer sheet, do not penalise pupils for writing the units again;

- accept responses with commas as spacers,
  eg 50,000
  but do not accept a point used as a spacer,
  eg 50.000

Lower tier Test C questions

'Now we are ready to start the test.

For the first group of questions you will have 5 seconds to work out each answer and write it down.'

1	Your answer sheet shows the price of a book. How much is the book, to the nearest pound?
2	Multiply four by four.
3	Subtract forty-eight from seventy.
4	What is fifty per cent of ten?
5	Look at the equation. Find the value of k.
6	What is half of two-thirds?

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

7	In a local swimming pool, thirty-two lengths is half a mile. How many lengths is one mile?
8	I bought three tickets for a concert. The total cost was forty-five pounds. How much was one ticket?
9	Your answer sheet shows part of a train timetable. How long does the journey take from Twyford to Maidenhead?
10	What is one quarter of sixty?
11	What is the perimeter of this square?
12	Look at the numbers. Put a ring round the median.
13	Look at the scale. About what value is the arrow pointing to?
14	My birthday is twenty-two days after my friend's birthday. This year my friend's birthday is on a Monday. On what day will my birthday be this year?
15	The longest flight of stairs in the world is in Switzerland. Your answer sheet shows how many stairs there are. Write this number to the nearest thousand.
16	Look at the numbers. What is the largest number that will divide exactly into both of these numbers?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2004
Mental mathematics Test C

First name _____

Last name _____

School _____

Total marks ☐

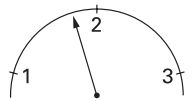
Practice question

		20

Time: 5 seconds

1	£	£16.55	1
2			2
3		70	3
4		50%	4
5		$k - 20 = 40$	5
6		$\frac{2}{3}$	6

Time: 10 seconds

7	lengths	32	7
8	£	£45	8
9	Reading 10:45 Twyford 10:54 Maidenhead 11:02 Slough 11:14 Paddington 11:38 minutes		9
10		60	10
11	..... cm	☐ 10 cm	11
12	4 9 10 13 20		12
13			13
14		22 days	14
15		11 674	15
16		12 20	16

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17	On the grid is a point marked A. Write the coordinates of this point.
18	What is the next number in the sequence of square numbers? One, four, nine, sixteen …
19	The chart shows the number of males and females who are members of a sports club. There are thirty males in the club. About how many females are there?
20	There are fourteen girls and thirteen boys in a class. What is the probability that a pupil chosen at random will be a girl?
21	Estimate the size of the angle, in degrees.
22	Look at the equation. When a is ten, what is the value of b?

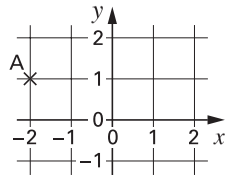
'For the next group of questions you will have 15 seconds to work out each answer and write it down.'

23	Look at the cube. I am going to hang it from the corner marked with an arrow. When it is hanging, which corner will be lowest? Mark the correct corner with a cross.
24	The diagram shows three circles. Shade the part of the diagram where all three circles overlap.
25	Look at the price list. I buy one sandwich, one yoghurt and two apples. How much money is that altogether?
26	In a survey, pupils were asked if they liked playing sport. Twenty pupils said yes. How many pupils said no?
27	Write three even numbers that add to twenty.
28	Work out the size of angle a.
29	What is the remainder when you divide three hundred by twenty-nine?
30	Look at the types of quadrilaterals on your answer sheet. Which of them must have sides that are all the same length? Ring the correct ones.

'Put your pens down. The test is finished.'

Time: 10 seconds continued

17



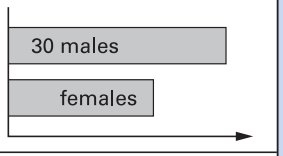
(,)

17

18 1, 4, 9, 16, ...

18

19



females

19

20 14 girls 13 boys

20

21

..... °

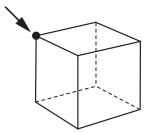
21

22 $b = 3a + 5$

22

Time: 15 seconds

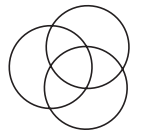
23



23

Time: 15 seconds continued

24



24

25

Sandwich	£1.50
Yoghurt	75p
Apple	30p

£

25

26

Yes	○○○○○
No	○○

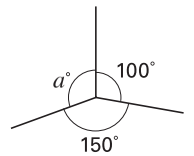
pupils

26

27 20

27

28



°

28

29 300 29

29

30

square rectangle

parallelogram

rhombus kite

30

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Key stage 3 mathematics 2004
Mental mathematics lower tier Test C

Test C
Mark scheme

Time: 5 seconds

1	£ **17 (.00)**	
2	**16**	
3	**22**	
4	**5**	Do not accept 5%
5	**60**	
6	**1**	Accept equivalent fractions or 0.33(…)

Time: 10 seconds

7	**64** lengths	
8	£ **15 (.00)**	
9	**8** minutes	
10	**15**	
11	**40** cm	
12	4 9 **(10)** 13 20	
13	**1.7 ≤ answer ≤ 1.8**	
14	**Tuesday**	Accept unambiguous abbreviation, eg Tues, Tu, but do not accept if ambiguous, eg T
15	**12 000**	Do not accept 12
16	**4**	Accept value repeated, eg 4 and 4, but do not accept if ambiguous, eg 4 + 4

Time: 10 seconds continued

17	(**–2**, **1**)	

18	**25**	Do not accept 5^2 or 5 x 5

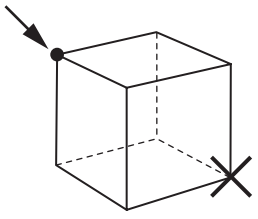
19	**18** ≤ **answer** ≤ **22** females

20	**14**	Accept equivalent probabilities, including 0.51(...) or 0.52 or equivalent percentages

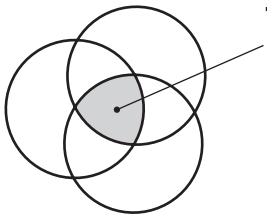
21	**55** ° ≤ **answer** ≤ **75** °

22	**35**	

Time: 15 seconds

23	

Time: 15 seconds continued

24	 **This region indicated**	

25	£ **2.85**	

26	**8** pupils	

27	**Any three even numbers that add to 20**	Accept repeated numbers, eg 2, 2, 16 0, 0, 20

28	**110** °	

29	**10**	Accept embedded response, eg 10 r10

30	square rectangle parallelogram

Higher tiers Test A questions

∞ ***'Now we are ready to start the test.***

For the first group of questions you will have 5 seconds to work out each answer and write it down.'

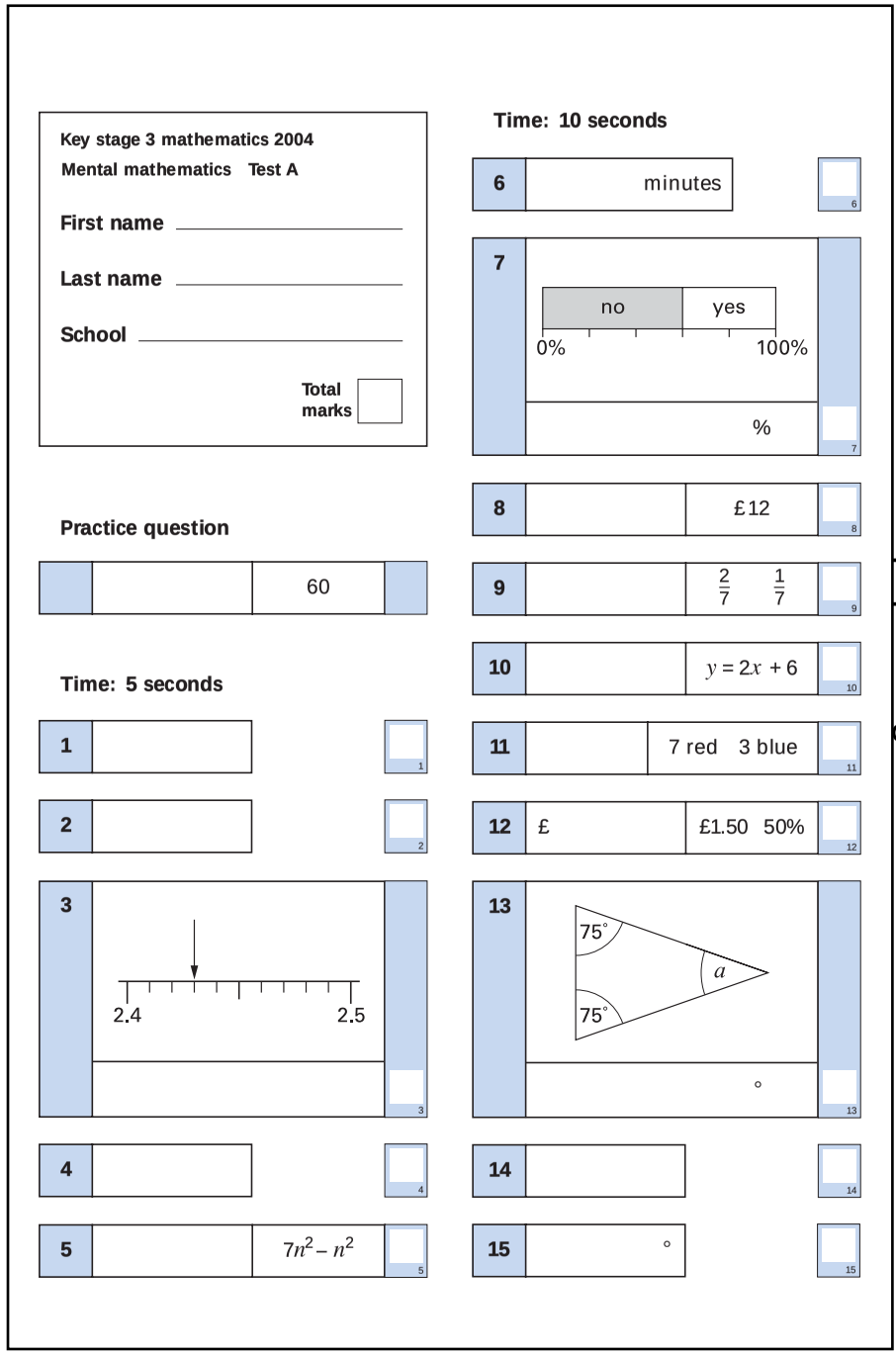
1	How many sides does an octagon have?
2	Divide forty-two by seven.
3	What number is the arrow pointing to on the number line?
4	Centimetres are a measure of length. What are square centimetres a measure of?
5	Look at the expression. Write it as simply as possible.

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

6	How many minutes are there in five hours?
7	In a survey people were asked if they had a mobile phone. The percentage bar chart shows the results. What percentage of people said yes?
8	I have a bag that contains twenty-pence coins. Altogether, I have twelve pounds. How many twenty-pence coins is that?
9	Add together the fractions on your answer sheet.
10	Look at the equation. When y equals forty-six, what is the value of x?
11	There are seven red and three blue balls in a bag. I am going to take a ball out of the bag at random. What is the probability that the ball will be blue?
12	Increase one pound fifty by fifty per cent.
13	Look at the triangle. What is the size of the angle marked a?
14	Subtract eleven from four.
15	What is the sum of the angles in a rhombus?

'Now turn over your answer sheet.'

Pupil answer sheet



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16	It takes me one and a half minutes to swim one length of the pool. How many lengths can I swim in fifteen minutes?
17	To the nearest whole number, what is the square root of eighty-three point nine?
18	A circle has radius r. What is the formula for the area of the circle?
19	Write an equation that shows that k is one more than twice m.
20	One hundred pet owners had a dog or a cat, or both. Fifty-five of the hundred had a dog. Sixty-five had a cat. How many had both a dog and a cat?
21	What must I multiply n squared by to get five n cubed?

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

22	The hands of a clock are at right angles. The minute hand is pointing to twelve. What could the hour hand be pointing to? There are two answers. Write them both.
23	The most popular months to get married are July, August and September. The table shows the percentages of marriages that are in those months. What percentage of marriages are not in those months?
24	Look at the fractions. Which of them are less than a half? Ring your answers.
25	A club played twenty-four games in a season. They won the same number of games as they lost. Use the pie chart to work out how many games they won.
26	The angles in a triangle are k, k plus ten and k plus twenty. What is the value of k?
27	A solid pyramid has seven faces. What shape is its base?
28	Write three numbers that have a mean of ten and a range of two.
29	The diagram shows a quadrilateral. Work out its area.
30	The first odd number is one. What is the hundredth odd number?

'Put your pens down. The test is finished.'

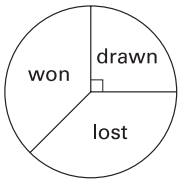
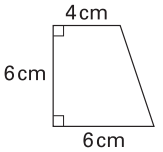
Time: 10 seconds continued

16	lengths	15	16
17		83.9	17
18			18
19	k is one more than twice m		19
20		55 65	20
21		n^2 $5n^3$	21

Time: 15 seconds

22	..... or	22
23	July 12% August 14% September 13% %	23

Time: 15 seconds continued

24	$\frac{1}{50}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{1}{10}$ $\frac{3}{7}$	24
25		25
26	k $(k + 10)$ $(k + 20)$	26
27		27
28	mean 10 range 2	28
29	 cm^2	29
30		30

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Key stage 3 mathematics 2004
Mental mathematics higher tiers Test A

Test A

Mark scheme

Time: 5 seconds

1	**8**	
2	**6**	
3	**2.43**	Accept equivalent fractions or decimals
4	**Area**	
5	**$6n^2$**	Do not accept unsimplified expressions, eg 6 x n^2

Time: 10 seconds

6	**300** minutes	
7	**40** %	Do not accept equivalent fractions or decimals
8	**60**	
9	**3**	Accept equivalent fractions or 0.42(...)
10	**20**	
11	**3**	Accept equivalent probabilities
12	£ **2.25**	
13	**30** °	
14	**– 7**	Do not accept 7–
15	**360** °	

Time: 10 seconds continued

16	**10** lengths	
17	**9**	
18	πr^2	Accept equivalent formulae, eg $\pi \times r \times r$, $A = \pi r^2$
19	$k = 2m + 1$	Accept equivalent equations, eg $2 \times m + 1 = k$
20	**20**	
21	$5n$	Accept $5 \times n$

Time: 15 seconds

22	**3** and **9**	Accept in either order
23	**61** %	Do not accept equivalent fractions or decimals

Time: 15 seconds continued

24	$\frac{1}{50}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{1}{10}$ $\frac{3}{7}$	
25	**9**	
26	**50**	Accept 50°
27	**Hexagon**	Do not accept a description of a hexagon, eg 6-sided
28	Any three numbers that **total 30** and have a **range of 2** eg 9, 10, 11	
29	**30** cm^2	
30	**199**	

Higher tiers Test B questions

'Now we are ready to start the test.

For the first group of questions you will have 5 seconds to work out each answer and write it down.'

1	How many hundreds are there in one thousand?
2	I asked people whether they used the internet last week. The pie chart shows the results. What percentage of people said no?
3	How many lines of symmetry does a rectangle have?
4	Ten per cent of a number is seven. What is the number?
5	Multiply minus six by minus two.

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

6	A magazine costs one pound forty pence. I buy two of them and pay with a five pound note. How much change should I get?
7	How many days are there in seven weeks and one day?
8	What is the smallest whole number that is divisible by five and by three?
9	I face south-west, then I turn through one hundred and eighty degrees. What direction am I facing now?
10	Multiply eight point seven by two.
11	Look at the polygon. What is its mathematical name?
12	Tariq won one hundred pounds in a maths competition. He gave two-fifths of his prize money to charity. How much of his prize money, in pounds, did he have left?
13	I am thinking of a number. I call it n. I double my number then I subtract three. Write an expression to show the result.
14	An event is certain to happen. Which number on your answer sheet represents its probability? Ring it.
15	Look at the grid. It is made from two sets of parallel lines. The angle marked is one hundred and forty degrees. On the grid, mark two different angles that are forty degrees.
16	Look at the equation. What is the value of x?
17	What percentage of fifty pounds is thirty-five pounds?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2004
Mental mathematics Test B

First name _____

Last name _____

School _____

Total marks

Practice question

60

Time: 5 seconds

1

2 — no, yes, %

3

4

5

Time: 10 seconds

6 £ £1.40

7 days

8

9 SW

10 8.7

11

12 £ $\frac{2}{5}$

13 n

14 0 $\frac{1}{2}$ 1 50 100

15 — 140°

16 $34 - 2x = 14$

17 % £50

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18	Multiply out the brackets.
19	The instructions for a fruit drink say to mix one part blackcurrant juice with four parts water. I want to make one litre of this fruit drink. How much blackcurrant juice should I use? Give your answer in millilitres.
20	A rectangular picture measures six centimetres by four centimetres. I enlarge the picture so that the longer side measures nine centimetres. What does the shorter side measure?
21	Look at the sequence of numbers. What could an expression for the *n*th term be?

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

22	The scale drawing shows a lake. I walk around the perimeter of this lake. Use the scale to estimate how many kilometres I walk.
23	The answer sheet shows the cost of theatre tickets. Mrs Jones wants to go with some children to the theatre. In total, she does not want to spend more than twenty-five pounds. What is the greatest number of children she can take?
24	The net of a triangular prism is made from triangles and rectangles. How many of each shape are needed?
25	I am going to throw a fair eight-sided dice, numbered twelve to nineteen. What is the probability that I will throw a prime number?
26	Four people went running. The graph shows the time taken and the distance travelled by each of the four. Write the letter of the person who had the greatest average speed.
27	Twenty different families were asked how many children they had. The table shows the results. Altogether, how many children are there in the twenty families?
28	Look at the calculation. Write down an approximate answer.
29	Look at the diagram. What is the equation of the line marked A?
30	I pay five pounds for a book and a magazine. The book costs four pounds more than the magazine. How much does the book cost?

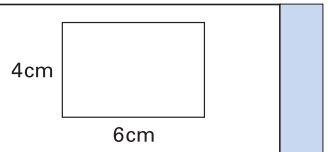
'Put your pens down. The test is finished.'

Time: 10 seconds continued

18 $4(7-y)$

19 ml 1 litre

20

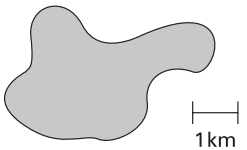


cm

21 1, 4, 9, 16, ...

Time: 15 seconds

22



km

23

Each adult	£6.99
Each child	£3.99

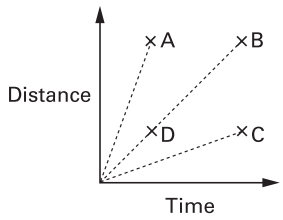
24 ..... triangles

..... rectangles

25 12 to 19

Time: 15 seconds continued

26

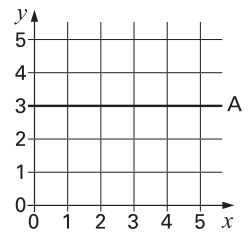


27

Number of children	Frequency
0	3
1	6
2	6
3	5

28 $\frac{40.04 \pm 29.8}{9.83}$

29



30 £

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Key stage 3 mathematics 2004
Mental mathematics higher tiers Test B

Test B
Mark scheme

Time: 5 seconds

1	**10**	
2	**25** %	Do not accept equivalent fractions or decimals
3	**2**	
4	**70**	Do not accept 70%
5	**12**	Accept +12

Time: 10 seconds

6	£ **2.20**	
7	**50** days	
8	**15**	
9	**North-east**	Accept unambiguous abbreviation, eg NE, and unconventional ordering, eg East-north
10	**17.4**	Accept equivalent fractions or decimals
11	**Hexagon**	Do not accept a description of a hexagon, eg 6-sided
12	£ **60**	
13	**$2n - 3$**	Accept unsimplified expressions, eg $2 \times n - 3$
14	0 1 (1) 50 100	
15	Indicates any **two 40° angles**, with none incorrect	
16	**10**	
17	**70** %	

Time: 10 seconds continued

18	**28 – 4*y***	Accept use of multiplication sign within 4*y*, eg 28 – 4 x *y*
19	**200** ml	
20	**6** cm	
21	n^2	Accept *n* x *n*

Time: 15 seconds

22	**11** km ≤ **answer** ≤ **17** km	
23	**4**	
24	**2** triangles **3** rectangles	
25	**3**	Accept equivalent probabilities

Time: 15 seconds continued

26	**A**	
27	**33**	
28	**115** ≤ **answer** ≤ **125**	
29	***y* = 3**	Accept equivalent equations
30	£ **4.50**	

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