Ma

KEY STAGE
3

LOWER TIER &
HIGHER TIERS

2008

Mathematics tests

Mark scheme

for Mental mathematics
tests A, B and C

National curriculum assessments

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Introduction

This booklet contains the mark schemes for the lower tier test (test C) and the higher tiers tests (tests A and B). 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	Add sixty-seven and fourteen.
2	How many sides does an octagon have?
3	Double nineteen.
4	Round four thousand two hundred and sixty-six to the nearest ten.
5	Multiply six by seven.
6	Look at the expression. Write it as simply as possible.
7	Write one quarter as a decimal.
8	What is nought point eight multiplied by five?

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

9	Look at the numbers on your answer sheet. Put a ring round the largest number.
10	Add together fourteen, fifteen and sixteen.
11	Look at the coins. How much money is shown altogether?
12	The table shows the price of a journey by train or bus. How much will it cost two adults and one child to make the journey by bus?
13	John went to France on the twenty-fifth of July and returned exactly one week later. On what date did John return?
14	The chart shows the number of men and women who work at a factory. One symbol represents twenty-five people. How many more men than women work at the factory?
15	Subtract three from three squared.
16	Sam is facing North. He turns clockwise to face North-East. Through how many degrees does he turn?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2008

Mental mathematics Test C

First name _____

Last name _____

School _____

Total marks

Practice question

49

Time: 5 seconds

1		67 14
2		
3		19
4		4266
5		6 7
6		$7k - 4k$
7		$\frac{1}{4}$
8		0.8 5

Time: 10 seconds

9 2010 2001 2100 2110 2101

10 14 15 16

11 £

12

	train	bus
adult	£2.00	£1.20
child	£1.00	40p

£

13 25th July

14

men	♀ ♀ ♀ ♀ ♀
women	♀ ♀

♀ = 25 people

15 3 3^2

16 ° N W E S

17	Look at the temperature shown on the thermometer. The temperature drops by five degrees Celsius. What is the new temperature?
18	Eight kilometres is about five miles. About how many miles is twenty-four kilometres?
19	Look at the triangle drawn on the grid. Write the coordinates of the point marked A.
20	What is the square root of eighty-one?
21	Look at the expression. I subtract three from the expression. Write the new expression as simply as possible.

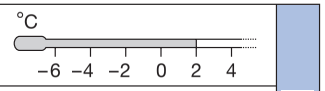
'For the next group of questions you will have 15 seconds to work out each answer and write it down.'

22	Your answer sheet shows the cost of three tins of cat food. How much would six of these tins cost?
23	I am thinking of a number. The number can be divided by three with no remainder. It can also be divided by four with no remainder. What could my number be?
24	The bar chart shows how Pete spent some of his day. How many more hours did he spend sleeping than working?
25	Look at the triangle and the square. The perimeter of the triangle is the same as the perimeter of the square. What is the side length of the square?
26	Look at the sequence of triangular numbers: one, three, six, ten, fifteen. What is the next number in the sequence?
27	Ben has one red marble, one green marble and three blue marbles in his pocket. He is going to take one of the marbles out of his pocket without looking. What is the probability it will be green?
28	Look at the information on your answer sheet. The total mass of the three boxes is two kilograms. What is the mass of box C?
29	Twenty-nine multiplied by thirty-four is nine hundred and eighty-six. What is nought point two nine multiplied by thirty-four?
30	Look at the diagram. Work out the size of angle a.

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

Time: 10 seconds continued

17

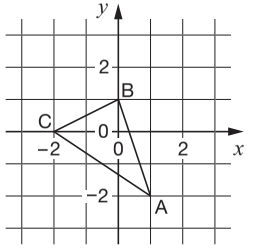


18

8 km 5 miles

miles

19



(,)

20

$\sqrt{81}$

21

$5b + 3$

Time: 15 seconds

22

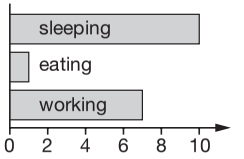
3 tins for 99p

£

23

Time: 15 seconds continued

24



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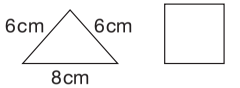


cm

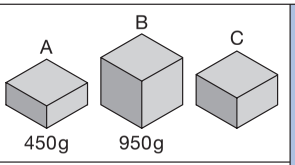
26

1, 3, 6, 10, 15, ____

27

1 red 1 green 3 blue

28



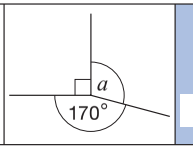
g

29

29 × 34 = 986

0.29 × 34 = ____

30



____ °

Key stage 3 mathematics 2008
Mental mathematics lower tier Test C

Test C
Mark scheme

Time: 5 seconds

1	81	
2	8	
3	38	
4	4270	
5	42	
6	$3k$	
7	0.25	Accept equivalent decimals Do not accept equivalent fractions
8	4 (.0)	

Time: 10 seconds

9	2010 2001 2100 **2110** 2101	
10	45	
11	£ 1.13	
12	£ 2.80	
13	1st August	Accept any unambiguous or commonly used indication of the date, eg 1 Aug, 1/8 or 8/1 [US notation] Ignore years given
14	75	
15	6	
16	45 °	Accept 45 + any multiple of 360

Time: 10 seconds continued

17	**–3** °C	
18	**14.9** ≤ **answer** ≤ **15.1** miles	
19	**(1, –2)**	
20	**9**	Accept –9 with 9 or alone Accept embedded values eg 9 × 9
21	**5*b***	

Time: 15 seconds

22	£ **1.98**	
23	**Any multiple of 12** Accept zero or negative multiples of 12	

Time: 15 seconds continued

24	**3**	
25	**5** cm	
26	**21**	
27	$\frac{1}{5}$	Accept equivalent probabilities
28	**600** g	
29	**9.86**	Accept equivalent fractions or decimals
30	**100** °	

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 sixes are there in forty-two?
2	Look at the numbers on your answer sheet. Write down the number that is the mode.
3	Look at the expression. Write it as simply as possible.
4	Subtract nought point one from four.
5	What number is eight more than minus two?
6	Look at the number on your answer sheet. Round it to one decimal place.
7	What is the gradient of the line with equation y equals three x plus two?

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

8	There are three hundred people at a concert. One hundred and fifty-five of them are male. How many are female?
9	Look at the shaded triangle drawn on a centimetre square grid. What is the area of the triangle?
10	Write down the multiple of twelve between forty and fifty.
11	Look at the triangle. Work out the size of angle p.
12	Look at the equation on your answer sheet. When b is three, what is the value of a?
13	Twenty per cent of a number is six. What is the number?
14	I travel at a constant speed of forty miles per hour. How far do I travel in two and a half hours?
15	On average I take twenty breaths in one minute. How many breaths is that in one hour?
16	Look at the expression. Multiply out the brackets.
17	Look at the number on your answer sheet. Halve it.

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2008

Mental mathematics Test A

First name _____

Last name _____

School _____

Total marks

Practice question

99

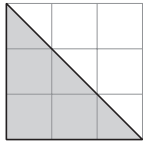
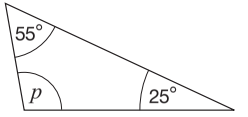
Time: 5 seconds

1		42
2	8 4 7 4 9	
3		$4b + 5b$
4		0.1 4
5		−2
6		4.875

Time: 5 seconds continued

7		$y = 3x + 2$

Time: 10 seconds

8		300
9	 cm^2	
10		40 50
11	 °	
12		$a = 5b - 4$
13		20% 6
14	miles	40mph
15		20
16		$3(a - 5)$
17		5.7

18	In a bag, there are only red, green and blue balls. Complete the table to show the probability of taking a blue ball.
19	In a sale, the price of a notebook is decreased by ten per cent. What is the new price if the old price was one pound twenty?
20	Look at the expression. Write down the value of the expression when m is six.

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

21	One of the shapes on your answer sheet is the net of a cuboid. Put a ring round the correct shape.
22	Twenty multiplied by thirty-eight is seven hundred and sixty. What is twenty-one multiplied by thirty-eight?
23	Look at the square grid. Shade one more square to give a shape with rotation symmetry of order two.
24	Thirty-two people were asked if they travelled to work by bus one morning. The pie chart shows the results. How many people said yes?
25	Look at the cuboid. It has a volume of one hundred cubic centimetres. Work out length a.
26	The frequency table shows the number of televisions owned by thirty families. Altogether how many televisions did they own?
27	A pyramid has five faces. How many sides does the base of the pyramid have?
28	Look at the numbers on your answer sheet. Add them.
29	Look at the rhombus. Work out its area.
30	Eight squared is the same as two to the power what?

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

Time: 10 seconds continued

18

Colour	Probability
red	0.4
green	0.3
blue	

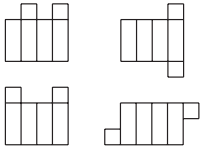
18

19 £ £1.20 19

20 $\frac{m^3}{m}$ 20

Time: 15 seconds

21



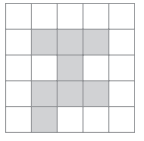
21

22 20 × 38 = 760

21 × 38 = ☐

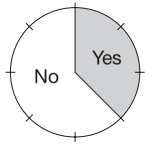
22

23



23

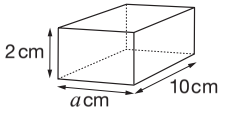
24



people 24

Time: 15 seconds continued

25



cm 25

26

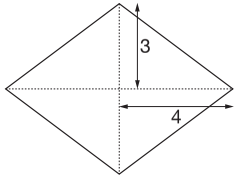
Televisions	Frequency
0	2
1	10
2	10
3	8

26

27 5 faces 27

28 $2\frac{3}{4}$ 0.3 28

29



29

30 8^2 30

Key stage 3 mathematics 2008
Mental mathematics higher tiers Test A

Test A
Mark scheme

Time: 5 seconds

1	7	Accept embedded values, eg 7 × 6
2	4	Accept value(s) indicated in list
3	$9b$	
4	3.9	Accept equivalent fractions or decimals
5	6	
6	4.9	Do not accept equivalent fractions or decimals

Time: 5 seconds continued

7	3	

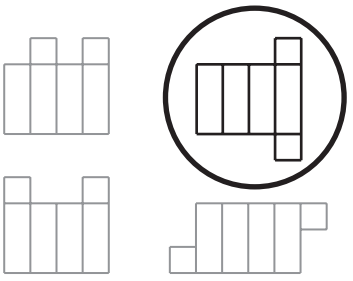
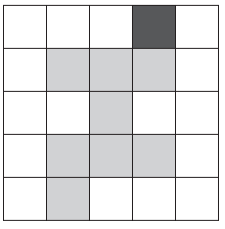
Time: 10 seconds

8	145	
9	$4\frac{1}{2}$ cm^2	Accept equivalent fractions or decimals
10	48	
11	100 °	
12	11	
13	30	Do not accept incorrect % signs
14	100 miles	
15	1200	
16	$3a - 15$	Accept unconventional notation, eg $3 \times a - 15$ Do not accept incomplete processing, eg $3 \times a - 3 \times 5$
17	2.85	Accept equivalent fractions or decimals

Time: 10 seconds continued

18	**0.3**	Accept equivalent probabilities
19	£ **1.08**	
20	**36**	Do not accept incomplete processing, eg $\frac{216}{6}$

Time: 15 seconds

21		
22	**798**	
23		
24	**12** people	

Time: 15 seconds continued

25	**5** cm	
26	**54**	
27	**4**	
28	**3.05**	Accept equivalent fractions or decimals
29	**24**	Ignore any units given
30	**6**	Accept embedded values, eg 2^6

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	Multiply six by six.
2	I start at four point seven and count on in equal steps: four point seven, four point eight, four point nine. Write down the next two numbers in the sequence.
3	Double the expression on your answer sheet.
4	Write seven-hundredths as a decimal.
5	Look at the scatter graph. It shows a type of correlation. Put a ring round the word that describes the type of correlation it shows.
6	Write ten out of twenty-five as a percentage.

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

7	Look at the triangle drawn on the grid. What are the coordinates of the point marked A?
8	Look at the scale. About what value is the arrow pointing to?
9	What is half of three pounds sixty?
10	How many millimetres are there in ten centimetres?
11	Double two point nine.
12	Look at the diagram. Estimate the size of angle a.
13	How many fifths are there in two?
14	What is one quarter of one hundred and forty-eight?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2008

Mental mathematics Test B

First name _____

Last name _____

School _____

Total marks

Practice question

99

Time: 5 seconds

1

2 4.7, 4.8, 4.9, ____, ____

3 $4pq$

4 $\frac{7}{100}$

5

None Gradient High

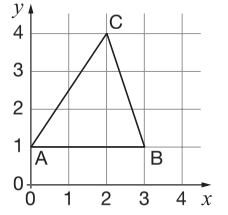
Positive Negative

Time: 5 seconds continued

6 % 10 out of 25

Time: 10 seconds

7



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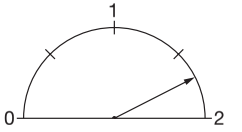
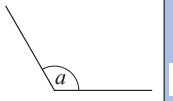


9 £ £3.60

10 mm 10 cm

11 2.9

12



13 $\frac{1}{5}$ 2

14 148

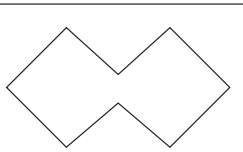
15	Look at the polygon. Write down its mathematical name.
16	There are seventeen red and thirteen green apples in a bag. I am going to take out an apple without looking. What is the probability that the apple will be green?
17	What is the next square number after thirty-six?
18	Look at the equation. What is the value of x?
19	A square of side two centimetres is enlarged by scale factor two. What is the area of the enlarged square?
20	Look at the expression. When x is three, what is the value of the expression?
21	A cylinder has a base area of ten square centimetres and a volume of ninety cubic centimetres. What is the height of the cylinder?

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

22	The line graph shows the number of ice creams sold at a cinema in one week. On how many days were the sales more than one hundred?
23	Think about a pyramid that has a triangular base. How many triangular faces does it have altogether?
24	Car parking costs forty pence for every five minutes. How much will it cost to park for one hour?
25	Look at the fractions. Put rings round all those that are greater than three-quarters.
26	A circle has a radius of five. One of the values on your answer sheet shows its circumference. Put a ring round the correct value.
27	A million pound lottery prize is divided in the ratio one to four to five. How much is the smallest share of the prize?
28	Look at the calculation on your answer sheet. Write an approximate answer.
29	Four numbers have a mean of twenty-five. Three of the numbers are shown on your answer sheet. Write down the missing number.
30	Look at the graph. Write down the equation of the line labelled A.

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

Time: 10 seconds continued

15 

16 17 red, 13 green

17 36

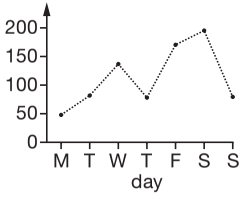
18 $21 - 3x = 9$

19 2 cm, Scale factor 2; cm^2

20 $(x + 2)(x - 1)$

21 $10cm^2$, $90cm^3$; cm

Time: 15 seconds

22 

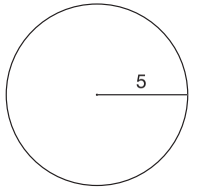
days

Time: 15 seconds continued

23

24 40p for 5 minutes; £

25 $\frac{3}{5}$ $\frac{4}{5}$ $\frac{5}{6}$ $\frac{6}{9}$ $\frac{7}{10}$

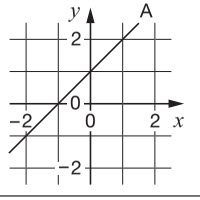
26 

5π 10π 15π 25π 100π

27 £ 1 : 4 : 5

28 $\frac{39.92 \times 41.06}{1.98}$

29 −20 80 40 ____

30 

Key stage 3 mathematics 2008
Mental mathematics higher tiers Test B

Test B
Mark scheme

Time: 5 seconds

1	**36**	
2	**5(.0)** and **5.1**	Accept pair in either order
3	$8pq$	Do not accept unconventional notation, eg $8 \times pq$
4	**0.07**	Accept equivalent decimals Do not accept equivalent fractions
5	None Gradient High Positive **Negative**	

Time: 5 seconds continued

6	**40** %	Do not accept equivalent fractions or decimals

Time: 10 seconds

7	**(0, 1)**	
8	**1.6 ≤ answer ≤ 1.8** Accept equivalent fractions or decimals	
9	£ **1.80**	
10	**100** mm	Do not accept amended units
11	**5.8**	Accept equivalent fractions or decimals
12	**110 ° ≤ answer ≤ 130 °**	
13	**10**	Accept embedded values, eg $\frac{10}{5}$
14	**37**	

Time: 10 seconds continued

15	**Octagon**	Ignore additional description, eg regular
16	**$\frac{13}{30}$**	Accept equivalent fractions Accept decimals as 0.43 or better or percentage equivalents
17	**49**	
18	**4**	
19	**16** cm^2	
20	**10**	Do not accept incomplete processing, eg 5 × 2
21	**9** cm	

Time: 15 seconds

22	**3** days	

Time: 15 seconds continued

23	**4**	
24	£ **4.80**	
25	$\frac{3}{5}$ **$\frac{4}{5}$** **$\frac{5}{6}$** $\frac{6}{9}$ $\frac{7}{10}$	
26	5π **10π** 15π 25π 100π	
27	£ **100 000**	
28	**800 ≤ answer ≤ 840**	
29	**0**	
30	**$y = x + 1$**	Accept equivalent equations Accept unconventional notation, eg $y = 1x + 1$

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