Ma

KEY STAGE 3

LOWER TIER & HIGHER TIERS

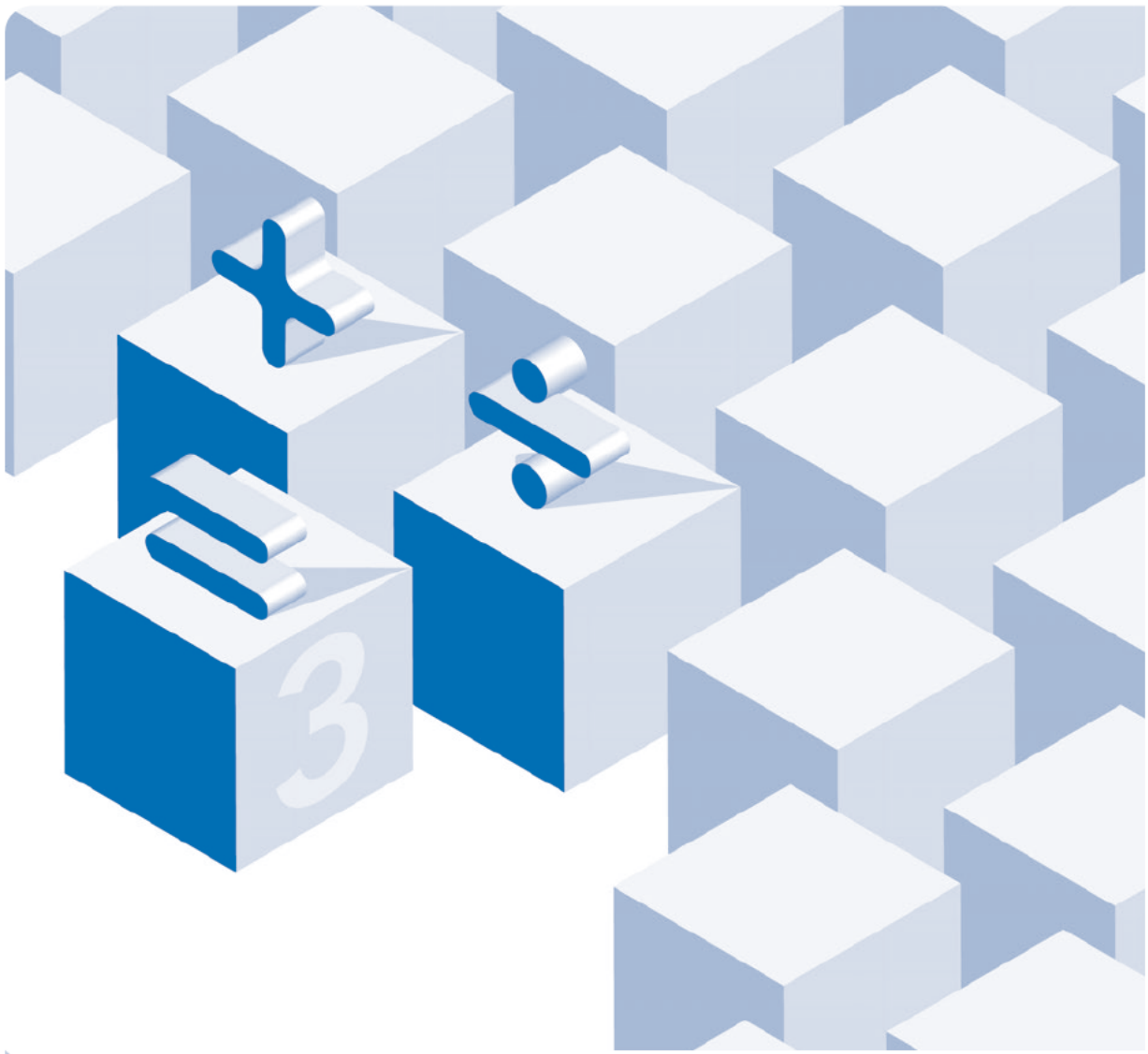
2007

Mathematics tests

Mark schemes

for Mental mathematics

Tests A, B and C



National curriculum assessments

QCA wishes to make its publications widely accessible.
Please contact us if you have any specific accessibility requirements.

First published 2007

ISBN 1-85838-875-9

Printed in Great Britain by the Qualifications and Curriculum Authority under the authority and superintendence of the Controller of Her Majesty's Stationery Office and Queen's Printer of Acts of Parliament.

The Qualifications and Curriculum Authority is an exempt charity under Schedule 2 of the Charities Act 1993.

Qualifications and Curriculum Authority
83 Piccadilly
London W1J 8QA
www.qca.org.uk

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	What is seventeen pounds eighty-five pence rounded to the nearest pound?
2	What number multiplied by five makes forty?
3	Look at the list of numbers on your answer sheet. What number is the mode?
4	Write in figures the number two thousand and twenty.
5	How many centimetres are seventy millimetres?
6	Write a number that is more than nought point one but less than nought point two.
7	I am thinking of a number. I call it n. I add eight to my number. Write an expression to show the result.
8	Look at the fraction. Write down a different fraction that is equivalent to four-fifths.

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

9	I start at forty and count down in equal steps. Forty, thirty-seven, thirty-four … What are the next two numbers?
10	The bar chart shows the eye colours of some pupils. How many of the pupils have blue eyes?
11	Shade one quarter of the square on your answer sheet.
12	I face north. I turn through half a turn. What direction am I facing after the turn?
13	Add the numbers on your answer sheet.
14	Look at your answer sheet. Estimate the length of the line in centimetres.
15	What is half of twenty-three?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2007

Mental mathematics Test C

First name _____

Last name _____

School _____

Total marks

Practice question

195

Time: 5 seconds

1 £ £17.85

2 5 40

3 7 5 8 4 5

4

5 cm 70mm

6 0.1 0.2

Time: 5 seconds continued

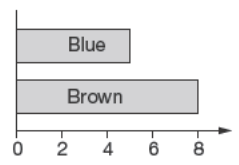
7 n

8 $\frac{4}{5}$

Time: 10 seconds

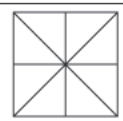
9 40, 37, 34, ____, ____

10



pupils

11



12 North

13 54 66

14

cm

15

16	In a survey, people were asked if they would prefer a cat or a dog for a pet. The pictogram shows the results. Six people said cat. How many people said dog?
17	I have a bag of twenty pence coins. Altogether I have seven pounds. How many twenty pence coins do I have?
18	Look at the equation. What is the value of y when x is twelve?
19	Look at the shape drawn on the square grid. How many lines of symmetry does it have?
20	Magazines cost one pound and forty pence each. I buy two of the magazines. How much change do I get from a ten pound note?
21	At sunrise the temperature was minus three degrees Celsius. By midday, the temperature had increased by twelve degrees. What was the temperature at midday?
22	Look at the rectangle. What is its area?
23	There are three red balls and two 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 red?
24	The diagram shows a line inside a square. What is the size of angle k?

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

25	Look at the price list. I buy one notebook, one ruler and one pencil. Altogether, how much do they cost?
26	The number one is a factor of both fifteen and twenty-four. What other number is a factor of both fifteen and twenty-four?
27	Your answer sheet shows the percentages of pupils born in different seasons for class A. The percentage for winter is missing. Fill in the percentage of class A that was born in winter.
28	Look at the scale. About what value is the arrow pointing to?
29	Your answer sheet shows the answer to twenty-eight multiplied by sixteen. Use this information to help you work out the answer to twenty-eight multiplied by thirty-two.
30	Look at the graph on your answer sheet. Write down the coordinates of any point on the line marked A.

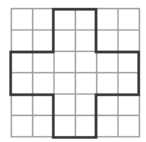
'Put your pens down. The test is finished.'

Time: 10 seconds continued

16 Cat ○○○ Dog ○○○○ people

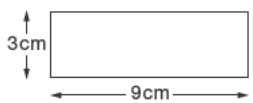
17 £7

18 $y = x - 7$

19 

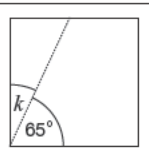
20 £ £1.40

21 °C −3°C

22 

cm²

23 3 red 2 blue

24 

°

Time: 15 seconds

25

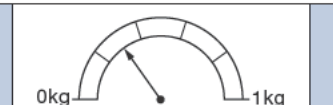
Notebook	£1.05
Ruler	65p
Pencil	40p

£

26 15 24

27

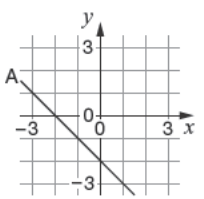
Spring	30%
Summer	22%
Autumn	28%
Winter	%

28 

kg

29 28 × 16 = 448

28 × 32 = ☐

30 

(,)

Key stage 3 mathematics 2007
Mental mathematics lower tier Test C

Test C
Mark scheme

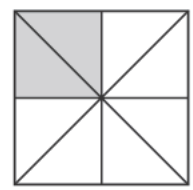
Time: 5 seconds

1	£ **18 (.00)**	
2	**8**	Accept embedded values, eg 8 × 5
3	**5**	Accept value indicated in list
4	**2020**	Do not accept responses given in words
5	**7** cm	Do not accept amended units
6	**0.1 < answer < 0.2**	

Time: 5 seconds continued

7	$n + 8$	Do not accept unconventional notation, eg $1 \times n + 8$
8	**Any fraction except $\frac{4}{5}$ that is equivalent to $\frac{4}{5}$, eg $\frac{8}{10}$, $\frac{40}{50}$**	
	Do not accept equivalent decimals	

Time: 10 seconds

9	**31** and **28**	Accept pair in either order
10	**5** pupils	
11	**Indicates any two small triangles, eg** 	
12	**South**	Accept any unambiguous indication of South, eg S
13	**120**	
14	**4** cm ≤ **answer** ≤ **5** cm	
15	$11\frac{1}{2}$	Accept equivalent fractions or decimals

Time: 10 seconds continued

16	**8** people	
17	**35**	
18	**5**	
19	**4**	
20	£ **7.20**	
21	**9** °C	
22	**27** cm^2	
23	$\frac{3}{5}$	Accept equivalent probabilities
24	**25** °	

Time: 15 seconds

25	£ **2.10**	
26	**3**	
27	**20** %	
28	**0.2** kg **<** **answer** **<** **0.4** kg Accept equivalent fractions or decimals	
29	**896**	
30	**Any pair of coordinates such that $x + y = -2$, eg (1, –3), (–1, –1)**	

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 days are there in ten weeks and two days?
2	Look at the number on your answer sheet. Divide it by one hundred.
3	Look at the numbers on your answer sheet. Add them.
4	Look at the types of triangles on your answer sheet. Put a ring round the one that must have three equal angles.
5	Write the fraction five-twentieths as simply as possible.
6	Round nought point three four eight to two decimal places.
7	Divide minus one hundred by minus ten.
8	Your answer sheet shows the rule for the nth term of a sequence. What is the fifth term of this sequence?
9	Four to the power nine divided by four to the power three is four to the power what?

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

10	Look at the triangle drawn on the grid. What are the coordinates of the point marked A?
11	A book has one hundred and twenty pages. I have read a quarter of the pages. How many pages have I read?
12	Look at the number on your answer sheet. How much must you add to it to make three thousand?
13	The total of four numbers is eighty. What is their mean?
14	Look at the diagram. Write down the size of angle m.
15	A book costs five pounds and ninety-nine pence. What is the total cost of three of these books?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2007

Mental mathematics Test A

First name _____

Last name _____

School _____

Total marks

Practice question

		5

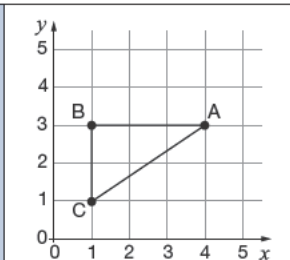
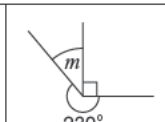
Time: 5 seconds

1		days	1
2		8400	2
3		−4 7	3
4	Isosceles Scalene Equilateral Right-angled		4
5		$\frac{5}{20}$	5
6		0.348	6

Time: 5 seconds continued

7		−100 −10	7
8		$n(n+3)$	8
9		4^9 4^3	9

Time: 10 seconds

10	 (,)		10
11		pages	120 11
12			2092 12
13			80 13
14	°		14
15	£		£5.99 15

16	What is twenty per cent of seven hundred?
17	Look at the isosceles triangle. What is the size of angle b?
18	Look at the equation. When x is three, what is the value of y?
19	The ratio of men to women in a chess club is three to two. There are fifty people in the chess club. How many are women?
20	Multiply two x by five y. Write your answer as simply as possible.
21	Write an approximate answer to the division on your answer sheet.
22	Look at the inequality. How many integer solutions are there?
23	A racing pigeon can fly at a speed of ninety kilometres per hour. At this speed, how far would it fly in one minute?

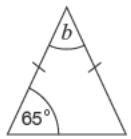
'For the next group of questions you will have 15 seconds to work out each answer and write it down.'

24	Look at the graph. By how much did the temperature fall between two pm and five pm?
25	Look at the rectangle with length six centimetres. Its perimeter is twenty centimetres. What is the width of the rectangle?
26	Look at the equation. When b is eight, what is the value of a?
27	One hundred and twenty people chose between three types of orange juice. The pie chart shows the results. Sixty people chose type A. Approximately, how many people chose type B?
28	Look at the circle with a radius of ten. One of the values below is its area. Put a ring round the correct area.
29	I am going to take a ball at random from a bag. The probability it will be blue is five-sixths. Twenty of the balls are blue. How many of the balls are not blue?
30	A photograph is enlarged using a scale factor of two and a half. After the enlargement, it has a length of twenty-five centimetres. What was its length before the enlargement?

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

Time: 10 seconds continued

16 — 700

17 — ° 

18 — $y = x^2 + 2$

19 — 3 : 2 50

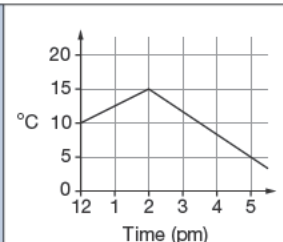
20 — $2x$ $5y$

21 — $\frac{3009}{599}$

22 — $5 \leqslant x < 9$

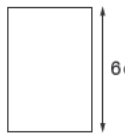
23 — km 90 km/h

Time: 15 seconds

24 

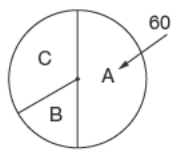
°C

Time: 15 seconds continued

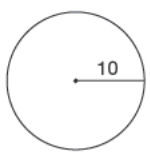
25 

cm

26 — $b = 2a - 4$

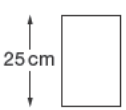
27 

people

28 

10π 20π 25π
30π 100π

29 — $\frac{5}{6}$ 20

30 

cm

Key stage 3 mathematics 2007
Mental mathematics higher tiers Test A

Test A
Mark scheme

Time: 5 seconds

1	**72** days	
2	**84**	
3	**3**	
4	Isosceles Scalene **Equilateral** Right-angled	
5	$\frac{1}{4}$	Do not accept equivalent fractions or decimals
6	**0.35**	Do not accept equivalent fractions or decimals

Time: 5 seconds continued

7	**10**	
8	**40**	Do not accept incomplete processing, eg 5 × 8
9	**6**	Accept embedded values, eg 4^6

Time: 10 seconds

10	(**4** , **3**)	
11	**30** pages	
12	**908**	Accept embedded values, eg 2092 + 908
13	**20**	
14	**40** °	
15	£ **17.97**	

Time: 10 seconds continued

16	**140**	Do not accept 140%
17	**50** °	
18	**11**	
19	**20**	
20	$10xy$	
21	**4.9 ≤ answer ≤ 5.1**	
22	**3**	Accept all integer solutions listed, ie 6, 7, 8 Do not accept a range, eg 6 to 8
23	$1\frac{1}{2}$ km	Accept equivalent fractions or decimals

Time: 15 seconds

24	**10** °C	

Time: 15 seconds continued

25	**4** cm	
26	**6**	Accept embedded values, eg 2 × 6 – 4
27	**18 ≤ answer ≤ 22** people	
28	10π 20π 25π 30π **100π**	
29	**4**	
30	**10** cm	

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	Write in figures the number six thousand and ten.
2	What is fifty-six divided by eight?
3	Look at the expression. Write it as simply as possible.
4	What is seven squared?
5	How many pairs of parallel sides must a trapezium have?
6	What number is nought point eight less than nine?
7	Write the ratio twelve to four as simply as possible.
8	I think of a number. I call it n. I square it and then subtract four. Write an expression to show the result.
9	Multiply minus four by minus five.
10	A line is twenty centimetres long to the nearest centimetre. What is the minimum length it can be?

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

11	A television programme lasts for an hour and a quarter. How many minutes is that?
12	Four hundred pupils were asked if they wanted to take art GCSE. The pie chart shows the results. How many pupils said no?
13	Look at the rectangle. Write down its perimeter.
14	Look at the triangle. Write down the size of angle c.
15	What number is the arrow pointing to on the number line?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2007

Mental mathematics Test B

First name _____

Last name _____

School _____

Total marks

Practice question

5

Time: 5 seconds

1		
2	56	
3	$6b - 4b$	
4	7	
5		
6	0.8 9	
7	12 : 4	

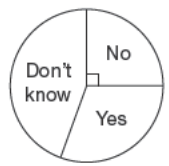
Time: 5 seconds continued

8	n	
9	−4 −5	
10	cm 20 cm	

Time: 10 seconds

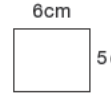
11 minutes

12



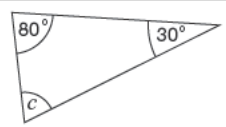
pupils

13



cm

14



°

15

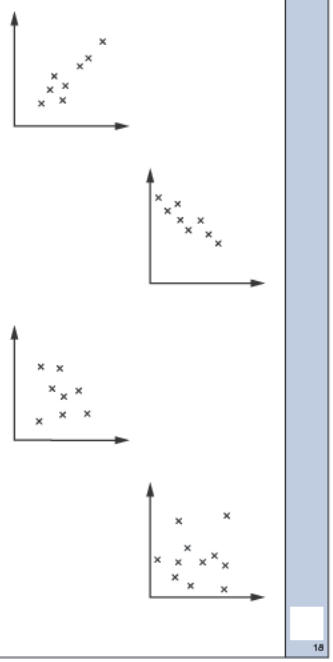
16	A fair six-sided dice is numbered one to six. I am going to roll the dice. What is the probability that I will roll a four?
17	A cuboid measures three centimetres by four centimetres by five centimetres. What is its volume?
18	Look at the scatter graphs. Put a ring round the graph that shows a positive correlation.
19	Write the fraction three-fifths as a percentage.
20	A car travels at an average speed of fifty miles per hour. How far does it travel in two and a half hours?
21	What is nought point four multiplied by nought point two?

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

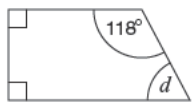
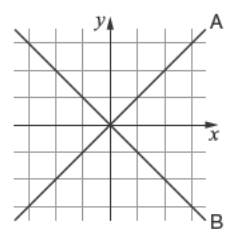
22	I have fifty-five twenty pence coins. How many pounds is this?
23	Look at the equation. When y is four, what is the value of x?
24	Eighteen multiplied by twenty-two is three hundred and ninety-six. What is three thousand nine hundred and sixty divided by eighteen?
25	Look at the quadrilateral. What is the size of angle d?
26	Look at the expression. When a is nought point three and b is nought point four, what is the value of the expression?
27	I think of a number. I square my number and get the answer one thousand six hundred. What could my number be?
28	Look at the graph. The equation of the line marked A is y equals x. Write down the equation of the line marked B.
29	The mean of two numbers is six. One of the numbers is minus three. What is the other number?
30	Look at your answer sheet. Complete the factorisation.

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

Time: 10 seconds continued

16	
17	3 cm by 4 cm by 5 cm cm^3
18	
19	% $\frac{3}{5}$
20	50 mph $2\frac{1}{2}$ hours miles
21	0.4 0.2

Time: 15 seconds

22	£ 55 20p
23	$y + 11 = 3x$
24	$18 \times 22 = 396$ $3960 \div 18 =$
25	 118° d °
26	$10(a + b)$ 0.3 0.4
27	1600
28	 y A x B
29	−3
30	$6p^2 + 12p = 6p(\_\_\_\_ + \_\_\_\_)$

Key stage 3 mathematics 2007
Mental mathematics higher tiers Test B

Test B
Mark scheme

Time: 5 seconds

1	6010	Do not accept responses given in words
2	7	
3	$2b$	
4	49	
5	1	
6	8.2	Accept equivalent fractions or decimals
7	3 : 1	Do not accept equivalent ratios

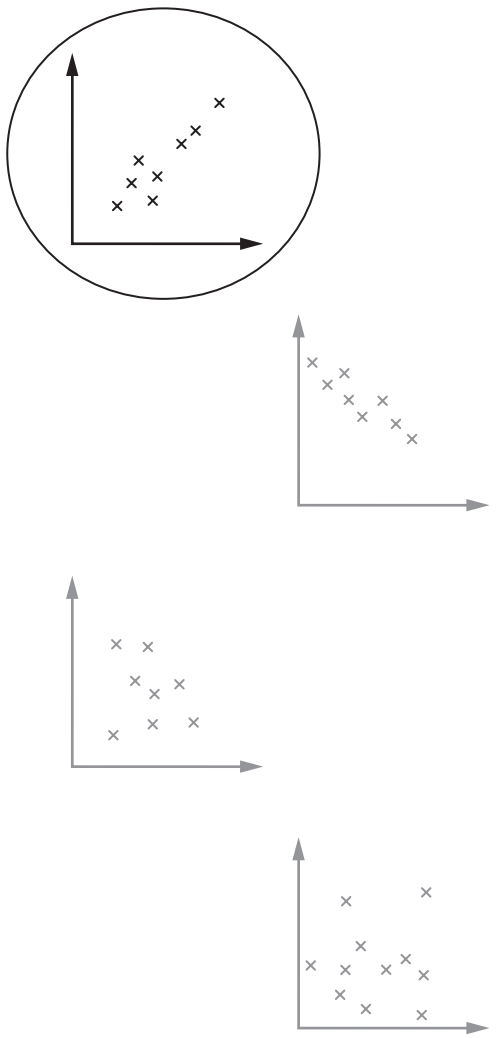
Time: 5 seconds continued

8	$n^2 - 4$	Do not accept unconventional notation, eg $n \times n - 4$
9	20	
10	19.5 cm	Accept equivalent fractions or decimals

Time: 10 seconds

11	75 minutes	
12	100 pupils	
13	22 cm	
14	70 °	
15	3.28	Accept equivalent fractions or decimals

Time: 10 seconds continued

16	$\frac{1}{6}$	Accept equivalent fractions Accept 0.16(…) or 0.17, or percentage equivalents
17	**60** cm^3	
18		
19	**60** %	Do not accept equivalent fractions or decimals
20	**125** miles	
21	**0.08**	Accept equivalent fractions or decimals

Time: 15 seconds

22	£ **11**	
23	**5**	Accept embedded values, eg 3 × 5
24	**220**	
25	**62** °	
26	**7**	Do not accept incomplete processing, eg 10 × 0.7
27	**40**	Accept –40 with 40 or alone
28	$y = -x$	Accept unconventional notation, eg $y = -1 \times x$
29	**15**	
30	$6p($ **p** $+$ **2** $)$ or $6p($ **2** $+$ **p** $)$	Accept unconventional notation, eg $6p(1p + 2)$

National Assessment Agency

29 Bolton Street
London W1J 8BT

Telephone: 08700 60 60 40
Minicom: 020 7509 6546
Fax: 020 7509 5908

Email: tests@naa.org.uk
Website: www.naa.org.uk/tests

Qualifications and Curriculum Authority

For more copies:
QCA Orderline, PO Box 29, Norwich NR3 1GN
www.qca.org.uk/orderline email: orderline@qca.org.uk
Tel: 08700 60 60 15 Fax: 08700 60 60 17
QCA/06/2778

