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KEY STAGE

3

LOWER TIER &
HIGHER TIERS

2003

Mathematics tests

Mark schemes for
Mental mathematics
Tests A, B and C

2003

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guarding standards

department for

education and skills

creating opportunity, releasing potential, achieving excellence

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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	Write in figures the number six hundred and nine.
2	Divide twenty by four.
3	A group of people had a meal in a restaurant. Your answer sheet shows the total cost. How much is this to the nearest ten pounds?
4	Look at the equation. When a is seven, what is the value of b ?
5	What is fifty per cent of twenty pounds?
6	Multiply seven by six.
7	Write a number that is bigger than nought point three but smaller than nought point four.
8	Add four to minus five.
9	I am thinking of a number. I call it n . I add five to my number. Write an expression to show the result.

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

10	It takes three hours to travel from my home to my friend's house. I arrive at two pm. At what time did I leave home? Write your answer using am or pm.
11	I am counting back in nought point ones. Five point three, five point two, five point one, ... Write down the next two numbers.
12	Subtract nine pence from ten pounds.
13	Shade one quarter of the diagram.
14	Add seventy-two and thirty-eight.
15	Two different lines are parallel. How many times do these lines touch?
16	A pupil did a survey to find out whether people watched the news on BBC or ITV. The bar chart shows her results. Sixty people said ITV. About how many people said BBC?

'Now turn over your answer sheet.'

Pupil answer sheet

Key stage 3 mathematics 2003
Mental mathematics Test C

First name _____

Last name _____

School _____

Total marks

Time: 5 seconds continued

7

8 -5

9 n

Time: 10 seconds

10 2 pm

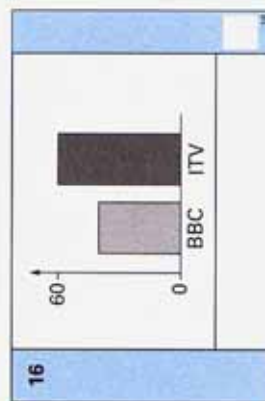
11 5.3, 5.2, 5.1, _____

12 £ 9p

13

14 72 38

15

16 

Practice question

30

Time: 5 seconds

1

2

3 £ £38.95

4 $a + b = 20$

5 £ 50%

6




17	Centimetres are a measure of length. Complete the sentence: Grams are a measure of ...
18	How much is half of nine pounds fifty?
19	The diagram shows a plan of a room. The scale is one centimetre to two metres. On the plan the room is four centimetres long. How long is the room in real life?
20	The pie chart shows how two hundred pupils travel to school. How many of these pupils walk to school?
21	The population of the United Kingdom is about fifty-nine million. Write this number in figures.
22	A pupil measures his height as six feet. About how many metres high is that? Ring the best answer on your answer sheet.
23	Write a multiple of three that is bigger than one hundred.
24	Look at the angle. Estimate its size in degrees.
25	Look at the expression. Write it as simply as possible.

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

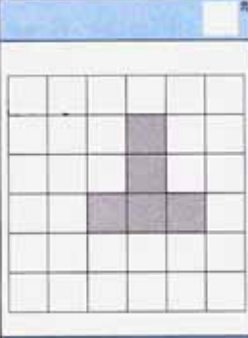
26	Your answer sheet shows part of a bus timetable. The buses run regularly. Complete the table to show the missing time.
27	Add together the numbers on your answer sheet.
28	Look at the square grid. Complete the diagram so that the shaded part is the net of a cube.
29	I am going to take a counter at random from a bag. The table shows the number of different coloured counters in the bag. What is the probability that the counter will be red?
30	Your answer sheet shows the answer to thirty-four multiplied by fifty-six. Use this information to help you work out the answer to thirty-five multiplied by fifty-six.

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

Time: 10 seconds continued

17	
18	£ <input type="text"/> £9.50
19	4cm  m
20	 pupils
21	
22	0.6 1 1.4 1.8 2.2
23	
24	
25	$3a + 4a + 2a$

Time: 15 seconds

26	Grey Rd 10 30 10 50 11 10 Station 10 48 11 08
27	18 19 20 21 22
28	
29	red 3 blue 7 green 10
30	$34 \times 56 = 1904$ 35×56

Test C

Mark scheme

Time: 5 seconds continued

7	0.3 < answer < 0.4	
	Accept equivalent fractions Do not accept incorrect notation, eg 0.3.5, $0.3\frac{1}{2}$	
8	-1	Do not accept 1-
9	$n + 5$	Accept multiplication by 1, eg $1 \times n + 5$

Time: 10 seconds

10	11 am	Do not accept 11:00 without am
11	5 and 4.9	Accept in either order Accept equivalent fractions or decimals
12	£ 9.91	
13	Any two squares shaded	
	Accept parts of squares shaded, provided the pupil's intention is clear	
14	110	
15	0	Accept responses given in words, eg 'Never' or 'They don't'
16	$35 \leq \text{answer} \leq 45$	
	Accept % sign given	

Time: 5 seconds

1	609	Do not accept responses given in words
2	5	
3	£ 40 (.00)	
4	13	
5	£ 10	Do not accept % signs given, eg £10%
6	42	

Time: 10 seconds continued

17	A word or expression implying 'mass', eg 'weight' or 'how heavy'
----	--

18	£ 4.75
----	--------

19	8 m
----	-----

20	50 pupils
----	-----------

21	59 000 000	Do not accept responses given in words
----	------------	--

22	0.6 1 1.4 1.8 2.2
----	------------------------------

23	Any number >100 that is a multiple of 3, eg 300	Do not accept incomplete processing, eg 3×50
----	---	---

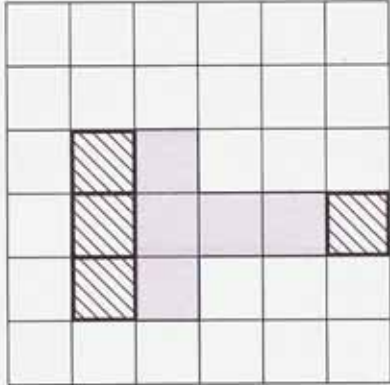
24	$120^\circ \leq \text{answer} \leq 150^\circ$
----	---

25	$9a$	Do not accept partially simplified expressions, eg $7a + 2a$ or $9 \times a$
----	------	--

Time: 15 seconds

26	11 28	Ignore am or pm given
----	-------	-----------------------

27	100
----	-----

28	<p>One correct square indicated, ie one of the striped squares shown below</p>  <p>Ignore tabs shown</p>
----	--

29	$\frac{3}{20}$	Accept equivalent probabilities
----	----------------	---------------------------------

30	1960
----	------

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	Multiply seven by seven.
2	How many nines are there in fifty-four?
3	What number should you add to minus three to get the answer five?
4	I'm thinking of a number. I call it n . I square my number then add four. Write an expression to show the result.
5	What number is five cubed?
6	A bat flies at an average speed of thirty kilometres per hour. At this speed, how far would it fly in one minute?

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

7	The bar chart shows when pupils in a class were born. Altogether, how many of the pupils were born in the autumn?
8	Look at the line drawn on the grid. Write the coordinates of any point that is on this line.
9	Subtract nought point seven five from six.
10	Look at the shaded triangle drawn on a centimetre square grid. What is the area of this triangle?

'Now turn over your answer sheet.'

11	How many pints are about the same as one litre? Ring the best answer on your answer sheet.
12	A fair spinner has eight equal sections with a number on each section. Five of them are even numbers. Three are odd numbers. What is the probability that I spin an even number?
13	Twenty-five per cent of a number is seven. What is the number?
14	Look at the equation. When y equals twenty-six, what is the value of x ?

Pupil answer sheet

Key stage 3 mathematics 2003
Mental mathematics Test A

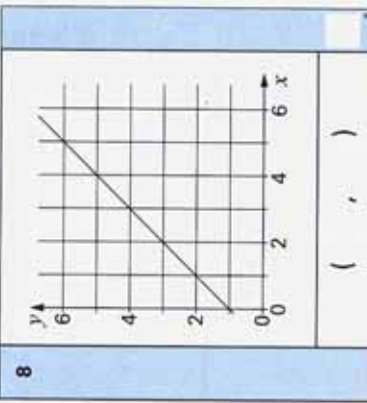
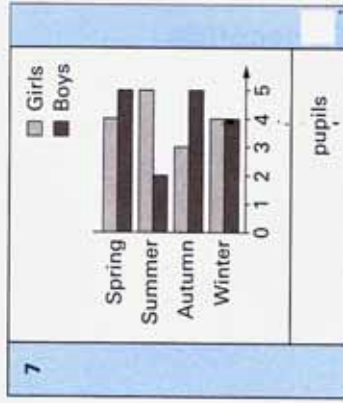
First name _____

Last name _____

School _____

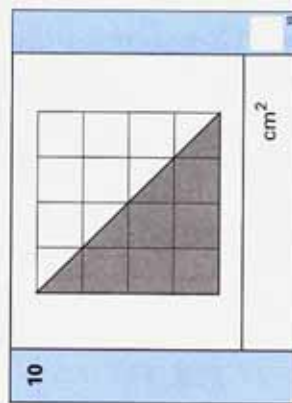
Total marks

Time: 10 seconds



9

<input type="text"/>	0.75
----------------------	------



Practice question

<input type="text"/>	60
----------------------	----

Time: 5 seconds

1	<input type="text"/>
---	----------------------

2	<input type="text"/>
---	----------------------

3	-3
---	----

4	n
---	-----

5	<input type="text"/>
---	----------------------

6	km	30 km per hour
---	----	----------------

15	The scale on my map is four centimetres to one kilometre. On the map the distance to the rail station is twenty centimetres. How many kilometres is it to the rail station?
16	What is three-fifths of forty pounds?
17	What is the volume of a cuboid measuring five centimetres by six centimetres by seven centimetres?
18	On average, the driest place on earth gets only nought point five millimetres of rain every year. In total, how much rain would it expect to get in twenty years?
19	Jenny and Mark share some money in the ratio two to three. Jenny's share is one hundred and ten pounds. How much is Mark's share?
20	Look at the expression. When k is four, work out the value of this expression.
21	Look at the inequality. How many integer solutions are there?

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

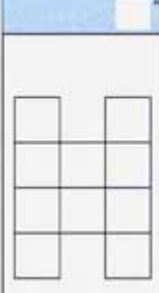
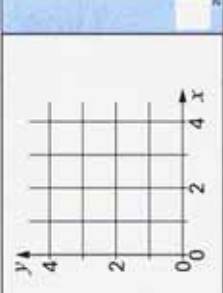
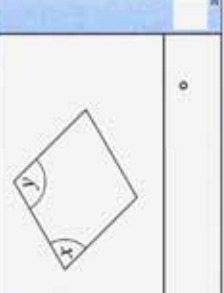
22	Look at the shape drawn on a square grid. It has two lines of symmetry. Shade two squares so that the shape still has two lines of symmetry.
23	I am thinking of a two-digit number that is a multiple of eight. The digits add up to six. What number am I thinking of?
24	Twenty-one out of thirty-six pupils said they watched Top of the Pops. What angle would show this on a pie chart?
25	On the grid, sketch the straight line with equation y equals three.
26	The diagram shows a rhombus. The angle marked x is seventy-five degrees. What is the size of the angle marked y ?
27	What would be the last digit of one hundred and thirty-three to the power four?
28	The mean of two numbers is eight. One of the numbers is minus four. What is the other number?
29	The area, in square centimetres, of a circle is nine pi. What is the radius of the circle?
30	Fill in the missing number in the number sentence.

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

Time: 10 seconds continued

11	1 2 3 4 5	11
12		12
13	25%	13
14	$y = 2x + 6$	14
15	km 4cm : 1 km	15
16	£ £40	16
17	cm^3 5 cm by 6 cm by 7 cm	17
18	mm 0.5 mm	18
19	£ 2 : 3	19
20	$(k + 1)(k + 2)$	20
21	$2 \leq x \leq 8$	21

Time: 15 seconds

22		22
23		23
24	$^{\circ}$ $\frac{21}{36}$	24
25		25
26		26
27	1334	27
28	8	28
29	cm 9π	29
30	$3.4 \times \underline{\hspace{1cm}} = 6.8 \times 3.5$	30

Test A

Mark scheme

Time: 10 seconds

7	8 pupils	
---	----------	--

8	Any point (x, y) with $y = x + 1$	
---	--	--

Time: 5 seconds

1	49	
---	----	--

2	6	Accept embedded values, eg 6×9
---	---	---

3	8	
---	---	--

4	$n^2 + 4$	Do not accept $n \times n$ for n^2
---	-----------	--------------------------------------

5	125	Do not accept incomplete processing, eg 5^3 or $5 \times 5 \times 5$
---	-----	--

6	0.5 km	Accept equivalent fractions or decimals
---	--------	---

9	5.25	Accept equivalent fractions or decimals
---	------	---

10	8 cm ²	
----	-------------------	--

Time: 10 seconds continued

11 1 (2) 3 4 5

12 $\frac{5}{8}$ Accept equivalent probabilities

13 28 Do not accept % signs given, eg 28%

14 10

15 5 km

16 £ 24

17 210 cm³

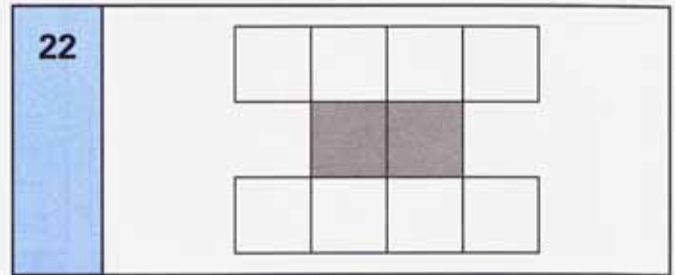
18 10 mm

19 £ 165

20 30 Do not accept incorrect notation, eg 30k

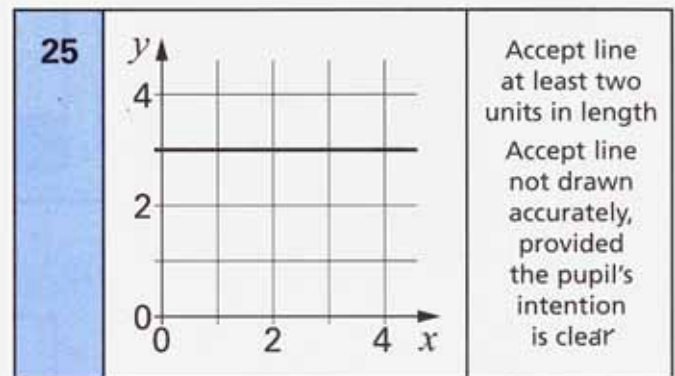
21 7 Accept all integer solutions listed, ie 2, 3, 4, 5, 6, 7, 8
Do not accept a range, eg 2 to 8

Time: 15 seconds



23 24

24 210° Accept 150°



26 105°

27 1 Do not accept 81

28 20

29 3 cm

30 7

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 thirty-one by ten.
2	How many centimetres are there in one metre?
3	What is one quarter of twenty-four?
4	Subtract three from minus five.
5	Look at the equation. When x equals six, what is the value of y ?
6	What is three point nine divided by two?
7	To the nearest centimetre the length of a pencil is ten centimetres. What is the least value the length of the pencil could be?

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

8	The chart shows the temperature at midday for one week. Which day had a midday temperature of five degrees Celsius?
9	A robot moves one metre north, then one metre east, then one metre south, then one metre west. What is the name of the shape of the robot's path?
10	Look at the triangle on the grid. Write the coordinates of the point marked C.
11	How many nought point fives are there in ten?
12	Think about the distance eight kilometres. About how many miles is that? Ring the best answer on your answer sheet.
13	Look at the fraction. Write it in its simplest form.

'Now turn over your answer sheet.'

14	In a survey, people said whether they liked Mexican food. The pie chart shows the results. What percentage of people said no?
15	What is the area of this square?

Pupil answer sheet

Key stage 3 mathematics 2003
Mental mathematics Test B

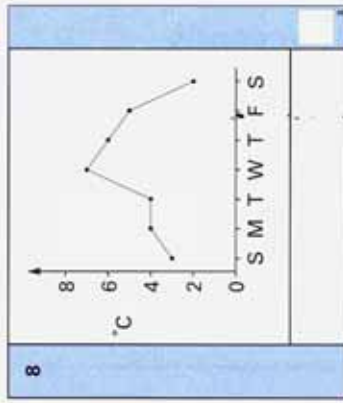
First name _____

Last name _____

School _____

Total marks

Time: 10 seconds



9

Practice question

<input type="text"/>	60	<input type="text"/>
----------------------	----	----------------------

Time: 5 seconds

1	<input type="text"/>	31	<input type="text"/>
---	----------------------	----	----------------------

2	<input type="text"/>	cm	<input type="text"/>
---	----------------------	----	----------------------

3	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	----------------------	----------------------	----------------------

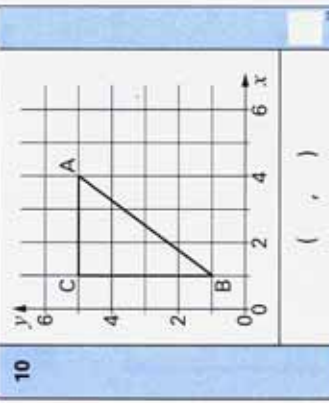
4	<input type="text"/>	-5	<input type="text"/>
---	----------------------	----	----------------------

5	<input type="text"/>	$y = x^2$	<input type="text"/>
---	----------------------	-----------	----------------------

6	<input type="text"/>	3.9	<input type="text"/>
---	----------------------	-----	----------------------

7	<input type="text"/>	cm	<input type="text"/>
---	----------------------	----	----------------------

10



11

(,)

12

<input type="text"/>	4	5	6	7	8	<input type="text"/>
----------------------	---	---	---	---	---	----------------------

13

<input type="text"/>	<input type="text"/>	120	<input type="text"/>
<input type="text"/>	<input type="text"/>	200	<input type="text"/>

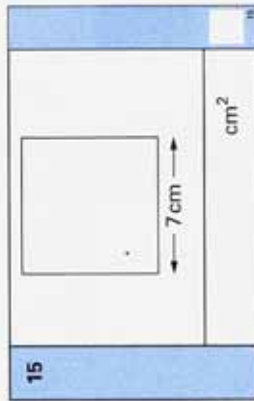
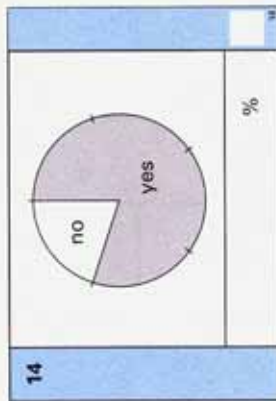
16	Look at the equation. Solve it to find the value of k .
17	The longest bone in the human body is in the leg. The average length of this bone in a man is fifty centimetres. In a woman it is ten per cent less. What is the average length of this bone in a woman?
18	A children's sandpit is a cuboid measuring three metres by four metres by fifty centimetres. Which of the calculations on your answer sheet will give the volume of the sandpit? Put a ring round it.
19	What is one third of three-quarters of one hundred?
20	Look at the inequality. How many integer solutions are there?

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

21	Write a factor of sixty that is bigger than ten but smaller than twenty.
22	The first even number is two. What is the hundredth even number?
23	On the grid, sketch the straight line with equation y equals x .
24	Using three as an approximation for pi, what is the area of a circle with radius five centimetres?
25	I can make a three-digit number from the digits two, three and four in six different ways. How many of these three-digit numbers are even?
26	Look at the calculation. Write down an approximate answer.
27	Complete the factorisation.
28	I am going to take a ball at random from a bag. The probability it will be red is two-fifths. There are eight red balls in the bag. How many of the balls are not red?
29	What 3-D shape has four vertices?
30	I write all the integers from one to one hundred. How many of these integers contain a digit two?

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

Time: 10 seconds continued



16

$$\frac{k}{2} = 20$$

17

$$cm \quad 50 \text{ cm}$$

18

3 m by 4 m by 50 cm	
$3 + 4 + 50$	$3 \times 4 \times 50$
$3 + 4 + 0.5$	$3 \times 4 \times 0.5$

19

$$100$$

20

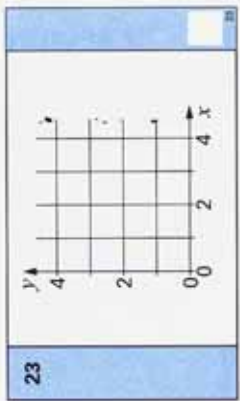
$$4 < k < 10$$

Time: 15 seconds

21

$$60$$

22



24

$$cm^2 \quad 5 \text{ cm}$$

25

26

$$\frac{29.95 \times 20.7}{4.97}$$

27

$$18y^2 + 6y = 6y (\quad + \quad)$$

28

$$\frac{2}{5}$$

29

30

Test B

Mark scheme

Time: 10 seconds

8	F	Accept any unambiguous indication
---	---	-----------------------------------

9	Square	Ignore any diagrammatic responses
---	--------	-----------------------------------

Time: 5 seconds

1	310	
---	-----	--

2	100 cm	
---	--------	--

3	6	
---	---	--

4	-8	Do not accept 8-
---	----	------------------

5	36	Do not accept incomplete processing, eg 6^2 or 6×6
---	----	---

6	1.95	Accept equivalent fractions or decimals
---	------	---

7	9.5 cm	Accept equivalent fractions or decimals
---	--------	---

10	(1, 5)	
----	--------	--

11	20	Accept embedded values, eg 20×0.5
----	----	--

12	4 (5) 6 7 8	
----	-------------	--

13	$\frac{3}{5}$	Do not accept equivalent fractions, decimals or percentages
----	---------------	---

Time: 10 seconds continued

14	20 %	Do not accept equivalent fractions or decimals
----	------	--

15	49 cm ²	
----	--------------------	--

16	40	
----	----	--

17	45 cm	Do not accept % signs given, eg 45%
----	-------	-------------------------------------

18	$3 + 4 + 50$ $3 \times 4 \times 50$ $3 + 4 + 0.5$ $3 \times 4 \times 0.5$	
----	--	--

19	25	
----	----	--

20	5	Accept all integer solutions listed, ie 5, 6, 7, 8, 9 Do not accept a range, eg 5 to 9
----	---	---

Time: 15 seconds

21	12 or 15	
----	----------	--

22	200	
----	-----	--

23		Accept line at least two diagonals in length Accept line not drawn accurately, provided the pupil's intention is clear
----	--	---

24	75 cm ²	
----	--------------------	--

25	4	Accept all possible even numbers listed, ie 234, 324, 342, 432 Accept reference to the total number of ways, eg $\frac{4}{6}$
----	---	--

26	$118 \leq \text{answer} \leq 132$	
----	-----------------------------------	--

27	3y and 1	Accept in either order
----	----------	------------------------

28	12	Accept reference to the total number, eg $\frac{12}{20}$ or 12 out of 20, provided 12 is shown
----	----	--

29	Tetrahedron	
	Accept 'triangular-based pyramid' and 'triangular pyramid'	

30	19	
----	----	--

EARLY YEARS

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5-16

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