Mathematics tests

Mark scheme for Paper 1
Tiers 3–5, 4–6, 5–7 and 6–8

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Introduction

The test papers will be marked by external markers. The markers will follow the mark scheme in this booklet, which is provided here to inform teachers.

This booklet contains the mark scheme for paper 1 at all tiers. The paper 2 mark scheme is printed in a separate booklet. Questions have been given names so that each one has a unique identifier irrespective of tier.

The structure of the mark schemes

The marking information for questions is set out in the form of tables, which start on page 10 of this booklet. The columns on the left-hand side of each table provide a quick reference to the tier, question number, question part, and the total number of marks available for that question part.

The **Correct response** column usually includes 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, and whether the marks are independent or cumulative;
- examples of some different types of correct response, including the most common.

The **Additional guidance** column indicates alternative acceptable responses, and provides details of specific types of response that are unacceptable. Other guidance, such as when 'follow through' is allowed, is provided as necessary.

Questions with a *UAM* element are identified in the mark scheme by an encircled U with a number that indicates the significance of using and applying mathematics in answering the question. The *U* number can be any whole number from 1 to the number of marks in the question.

The 2003 key stage 3 mathematics tests and mark schemes were developed by the Mathematics Test Development Team at QCA.

General guidance

Using the mark schemes

Answers that are numerically equivalent or algebraically equivalent are acceptable unless the mark scheme states otherwise.

In order to ensure consistency of marking, the most frequent procedural queries are listed on the following two pages with the prescribed correct action. This is followed by further guidance relating to marking of questions that involve money, time, coordinates, algebra or probability. Unless otherwise specified in the mark scheme, markers should apply the following guidelines in all cases.

What if …

The pupil's response does not match closely any of the examples given.	Markers should use their judgement in deciding whether the response corresponds with the statement of requirements given in the **Correct response** column. Refer also to the **Additional guidance.**
The pupil has responded in a non-standard way.	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, is acceptable. Provided there is no ambiguity, condone the continental practice of using a comma for a decimal point.
The pupil has made a conceptual error.	In some questions, a method mark is available provided the pupil has made a computational, rather than conceptual, error. A computational error is a slip such as writing $4 \times 6 = 18$ in an otherwise correct long multiplication. A conceptual error is a more serious misunderstanding of the relevant mathematics; when such an error is seen no method marks may be awarded. Examples of conceptual errors are: misunderstanding of place value, such as multiplying by 2 rather than 20 when calculating 35×27; subtracting the smaller value from the larger in calculations such as $45 - 26$ to give the answer 21; incorrect signs when working with negative numbers.
The pupil's accuracy is marginal according to the overlay provided.	Overlays can never be 100% accurate. However, provided the answer is within, or touches, the boundaries given, the mark(s) should be awarded.
The pupil's answer correctly follows through from earlier incorrect work.	Follow through marks may be awarded only when specifically stated in the mark scheme, but should not be allowed if the difficulty level of the question has been lowered. Either the correct response or an acceptable follow through response should be marked as correct.
There appears to be a misreading affecting the working.	This is when the pupil misreads the information given in the question and uses different information. If the original intention or difficulty level of the question is not reduced, deduct one mark only. If the original intention or difficulty level is reduced, do not award any marks for the question part.
The correct answer is in the wrong place.	Where a pupil has shown understanding of the question, the mark(s) should 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.

What if ...

The final answer is wrong but the correct answer is shown in the working.	Where appropriate, detailed guidance will be given in the mark scheme and must be adhered to. If no guidance is given, markers will need to examine each case to decide whether:	
	the incorrect answer is due to a transcription error;	If so, award the mark.
	in questions not testing accuracy, the correct answer has been given but then rounded or truncated;	If so, award the mark.
	the pupil has continued to give redundant extra working which does not contradict work already done;	If so, award the mark.
	the pupil has continued, in the same part of the question, to give redundant extra working which does contradict work already done.	If so, do not award the mark. Where a question part carries more than one mark, only the final mark should be withheld.
The pupil's answer is correct but the wrong working is seen.	A correct response should always be marked as correct unless the mark scheme states otherwise.	
The correct response has been crossed or rubbed out and not replaced.	Mark, according to the mark scheme, any legible crossed or rubbed out work that has not been replaced.	
More than one answer is given.	If all answers given are correct or a range of answers is given, all of which are correct, the mark should be awarded unless prohibited by the mark scheme. If both correct and incorrect responses are given, no mark should be awarded.	
The answer is correct but, in a later part of the question, the pupil has contradicted this response.	A mark given for one part should not be disallowed for working or answers given in a different part, unless the mark scheme specifically states otherwise.	

Marking specific types of question

Responses involving money
For example: £3.20   £7

Accept ✓	Do not accept ✗

✓ Any unambiguous indication of the correct amount
    eg   £3.20(p), £3 20, £3,20,
          3 pounds 20, £3-20,
          £3 20 pence, £3:20,
          £7.00
 	
✓ The £ sign is usually already printed in the answer space. Where the pupil writes an answer other than in the answer space, or crosses out the £ sign, accept an answer with correct units in pounds and/or pence
    eg   320p,
          700p
	✗ Incorrect or ambiguous use of pounds or pence
	    eg £320, £320p or £700p,
	          or 3.20 or 3.20p not in
	          the answer space.
	
	✗ Incorrect placement of decimal points, spaces, etc or incorrect use or omission of 0
	
	    eg £3.2, £3 200, £32 0,
	          £3-2-0,
	          £7.0

Responses involving time
A time interval   *For example: 2 hours 30 mins*

Accept ✓	Take care ! Do not accept ✗

✓ Any unambiguous indication
    eg   2.5 (hours), 2h 30
 	
✓ Digital electronic time
    ie   2:30
	✗ Incorrect or ambiguous time interval
	    eg 2.3(h), 2.30, 2-30, 2h 3,
	          2.30min
	
	! The time unit, hours or minutes, is usually printed in the answer space. Where the pupil writes an answer other than in the answer space, or crosses out the given unit, accept an answer with correct units in hours or minutes, unless the question has asked for a specific unit to be used.

A specific time   *For example: 8.40am, 17:20*

Accept ✓	Do not accept ✗

✓ Any unambiguous, correct indication
    eg   08.40, 8.40, 8:40, 0840, 8 40,
          8-40, twenty to nine,
          8,40
 	
✓ Unambiguous change to 12 or 24 hour clock
    eg   17:20 as 5:20pm, 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, 084, 84

Responses involving coordinates
For example: (5, 7)

Accept ✓	Do not accept ✗
✓ Unambiguous but unconventional notation eg (05, 07) (five, seven) $\overset{x\ \ y}{(\,5,\,7\,)}$ (x=5, y=7)	✗ Incorrect or ambiguous notation eg (7, 5) (5x, 7y) (x5, y7) (5^x, 7^y)

Responses involving the use of algebra
For example: $2 + n$ $n + 2$ $2n$

Accept ✓	Take care ! Do not accept ✗
✓ The unambiguous use of a different case eg N used for n ✓ Unconventional notation for multiplication eg $n \times 2$ or $2 \times n$ or $n2$ or $n + n$ for $2n$ $n \times n$ for n^2 ✓ Multiplication by 1 or 0 eg $2 + 1n$ for $2 + n$ $2 + 0n$ for 2 ✓ Words used to precede or follow equations or expressions eg $t = n + 2$ tiles or tiles $= t = n + 2$ for $t = n + 2$ ✓ Unambiguous letters used to indicate expressions eg $t = n + 2$ for $n + 2$ ✓ Embedded values given when solving equations eg $3 \times 10 + 2 = 32$ for $3x + 2 = 32$	! Words or units used within equations or expressions should be ignored if accompanied by an acceptable response, but should not be accepted on their own eg do not accept n tiles + 2 n cm + 2 ✗ Change of variable eg x used for n ✗ Ambiguous letters used to indicate expressions eg $n = n + 2$ However, to avoid penalising any of the three types of error above more than once within each question, do not award the mark for the *first* occurrence of each type within each question. Where a question part carries more than one mark, only the final mark should be withheld. ✗ Embedded values that are then contradicted eg for $3x + 2 = 32$, $3 \times 10 + 2 = 32, x = 5$

Responses involving probability

A numerical probability should be expressed as a decimal, fraction or percentage only.

For example: 0.7

Accept ✓	Take care ! Do not accept ✗
✓ A correct probability that is correctly expressed as a decimal, fraction or percentage. ✓ Equivalent decimals, fractions or percentages eg 0.700, $\frac{70}{100}$, $\frac{35}{50}$, 70.0% ✓ A probability correctly expressed in one acceptable form which is then incorrectly converted, but is still less than 1 and greater than 0 eg $\frac{70}{100} = \frac{18}{25}$	The following four categories of error should be ignored if accompanied by an acceptable response, but should not be accepted on their own. ! A probability that is incorrectly expressed eg 7 in 10, 7 out of 10, 7 from 10 ! A probability expressed as a percentage without a percentage sign. ! A fraction with other than integers in the numerator and/or denominator. However, each of the three types of error above should not be penalised more than once within each question. Do not award the mark for the *first* occurrence of each type of error unaccompanied by an acceptable response. Where a question part carries more than one mark, only the final mark should be withheld. ! A probability expressed as a ratio eg 7 : 10, 7 : 3, 7 to 10 ✗ A probability greater than 1 or less than 0

Recording marks awarded on the test paper

All questions, even those not attempted by the pupil, will be marked, with a 1 or a 0 entered in each marking space. Where 2m can be split into 1m gained and 1m lost, with no explicit order, then this will be recorded by the marker as 1
0

The total marks awarded for a double page will be written in the box at the bottom of the right-hand page, and the total number of marks obtained on the paper will be recorded on the front of the test paper.

A total of 120 marks is available in tiers 3–5, 4–6 and 6–8.
A total of 122 marks is available in tier 5–7.
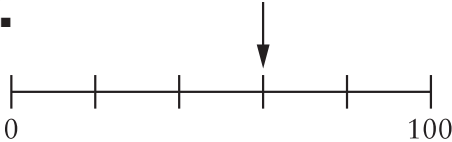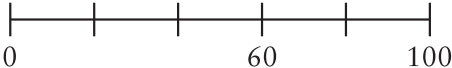
Awarding levels

The sum of the marks gained on paper 1, paper 2 and the mental mathematics paper determines the level awarded. Level threshold tables, which show the mark ranges for the award of different levels, will be available on the QCA website *www.qca.org.uk* from Monday, 23 June 2003. QCA will also send a copy to each school in July.

Schools will be notified of pupils' results by means of a marksheet, which will be returned to schools by the external marking agency with the pupils' marked scripts. The marksheet will include pupils' scores on the test papers and the levels awarded.
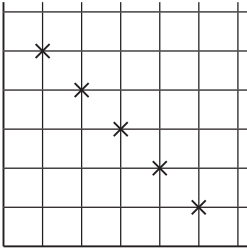
Tier & Question						
3-5	4-6	5-7	6-8			**Pictogram**
1					Correct response	Additional guidance
a				1m	Draws two circles	✓ *Circles not shaded* ! *Circles inaccurate in size and/or shape* Accept provided the pupil's intention is clear
b				1m	2	

Tier & Question						
3-5	4-6	5-7	6-8			**Missing numbers**
2					Correct response	Additional guidance
				1m	Gives any three numbers that add to 15 eg ■ 5 + 6 + 4 ■ 5 + 5 + 5	✓ *Throughout the question, use of fractions, decimals, negatives or zeros*
				1m	Gives any two numbers that multiply to 15 eg ■ 3 × 5 ■ 1 × 15	
				1m	Gives any two numbers that divide to give 15 eg ■ 30 ÷ 2 ■ 15 ÷ 1	✘ *Incorrect order* eg ◆ 2 ÷ 30
				1m	Gives any three numbers that combine as shown to give 15 eg ■ 2 × 6 + 3	✓ *Brackets inserted to change order of operations* eg ◆ 3 × (1 + 4) ✘ *Incorrect order of operations* eg ◆ 3 × 1 + 4

Tier & Question					Scales	
3-5	4-6	5-7	6-8			
3					**Correct response**	**Additional guidance**
a				**1m**	60	✓ *Value between 59 and 61 inclusive* ! *Units given* Ignore
b				**1m**	Indicates the correct position eg 	✓ *Unambiguous indication* eg ! *Follow through* Accept follow through from part (a), provided their (a) is not 0, 50 or 100 ! *Position not indicated accurately* Accept within 2mm

Prices

Tier & Question						Correct response	Additional guidance
3-5	4-6	5-7	6-8				
4						**Correct response**	**Additional guidance**
a				**1m**		Indicates a correct amount in pounds or pence and gives the correct units eg ■ 75p ■ £0.75	**!** *Units incorrect or omitted* Penalise only the first occurrence eg • 75 (units omitted) 1.05p (units incorrect) Mark as 0, 1
				1m		Indicates a correct amount in pounds or pence and gives the correct units eg ■ £1.05 ■ 105p	
				1m		Indicates one eraser	**✓** *Quantity of one implicit but not specified* eg, for the third mark in part (a) • Eraser eg, for part (b) • Ruler and two pencils
b				**1m**		Indicates a correct way, other than two rulers eg ■ 4 pencils ■ 3 erasers ■ 1 eraser and 1 green pen ■ 1 ruler and 2 pencils	**✓** *Unambiguous indication* eg, for the third mark in part (a) • E • Rubber eg, for part (b) • R and 2P
				(U1)			
				1m		Indicates a correct way, other than one previously credited	
				(U1)			
				1m		Indicates a correct way, other than one previously credited	
				(U1)			
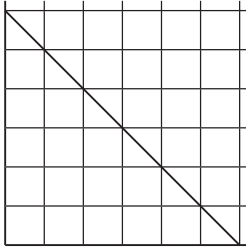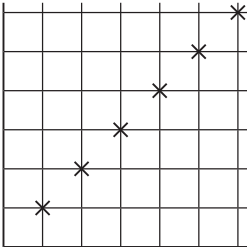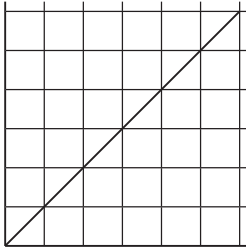
Tier & Question						
3-5	4-6	5-7	6-8			**Clock**
5					Correct response	Additional guidance

a				1m	Indicates only the two correct clocks
					eg
					■
					   ✓
					
					   ....
					
					   ....
					   ✓
					
					   ....
						! *Indication other than ticks*
						eg
						  ◆ ✗ used
						Accept provided unambiguous

b				1m	5:15 or 05:15	✓ *Superfluous indication of morning*
						eg
						  ◆ 5:15 am
						
						✗ *Time incorrect*
						eg
						  ◆ 5:15 pm
						  ◆ 17:15

c				1m	17:15	**!** *Follow through*
						Accept follow through as 12 hours later than their (b), even if their (b) was 17:15, provided this is written as a possible time
						eg, from part (b) as 03:26, accept
						  ◆ 15:26
						
						✓ *Superfluous indication of evening*
						eg
						  ◆ 17:15 pm
						
						✗ *Time incorrect or not using 24 hour clock*
						eg
						  ◆ 17:15 am
						  ◆ 5:15 pm

Tier & Question						Calculations
3-5	4-6	5-7	6-8		Correct response	Additional guidance
6	**3**					
a				1m	72	
b				1m	22	
c				1m	97	
				1m	26	
				1m	1256	
				1m	4348	

Tier & Question						Chains
3-5	4-6	5-7	6-8		Correct response	Additional guidance
7	**1**					
a	a			1m	Gives both correct values correctly positioned, ie 20 and 320	
b	b			1m	Gives both correct values correctly positioned, ie 5 and $2\frac{1}{2}$ or equivalent	✓ *For* $2\frac{1}{2}$, $\frac{5}{2}$

Puzzling out

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
8	2					

2m   Indicates the numbers 1, 3, 5, 7, 9 in any order

or
1m   Indicates any five numbers that are less than 10
eg
- 0, 2, 4, 6, 8
- 7, 7, 1, 2, 6
- −4, −4, −4, −4, −1.5

or

Indicates any five odd numbers
eg
- 7, 7, 15, 13, 9

(U1)

Wind chill

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
9	4					

1m   −19

  ! *Incorrect notation for negative numbers*
eg
- 19−

Penalise only the first occurrence

1m   16

  ✖ *−16 given for 16*

1m   −22

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Throwing dice

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Tier & Question						
3-5	4-6	5-7	6-8		Correct response	Additional guidance
10	5					

a	a			**2m**	Indicates only the five points with positive integer coordinates whose sum is 6 eg 	**!** *Point(s) not indicated accurately* Accept in parts (a) and (b) provided the pupil's intention is clear **!** *Additional points indicated that assume zero to be on the dice* eg ◆ (0, 6) and/or (6, 0) indicated If this is the only error, mark as 1, 0 **!** *Additional points with non-integer coordinates whose sum is 6 indicated* eg ◆ If this is the only error, mark as 1, 0
				or **1m**	Indicates at least four correct points with no incorrect points or Indicates all five correct points with not more than one incorrect point	
b	b			**2m**	Indicates only the six points with positive integer coordinates such that $y = x$ eg 	**!** *Additional point indicated that assumes zero to be on the dice* eg ◆ (0, 0) indicated If this error has been penalised in part (a), condone If this is the only error and it has not been penalised in part (a), mark as 1, 0 **!** *Additional points with non-integer coordinates such that $y = x$ indicated* eg ◆ If this error has been penalised in part (a), condone If this is the only error and it has not been penalised in part (a), mark as 1, 0
				or **1m**	Indicates at least five correct points with no incorrect points or Indicates all six correct points with not more than one incorrect point	

Tier & Question						
3-5	4-6	5-7	6-8		**Correct response**	**Throwing dice (cont)**
10	**5**					**Additional guidance**

| c | c | | | **1m** | Completes the sentence to give a correct rule eg | ✓ *Minimally acceptable rule* |

Throwing dice (cont)

Completes the sentence to give a correct rule
eg
- One less than the number on the red dice
- Red − 1
- Needing 1 added to get the number on the red dice

✓ *Minimally acceptable rule*
eg
- 1 below the other dice
- The number below the red dice

✓ *Rule expressed algebraically*
eg
- $b = r - 1$
- $r - 1$

! *Rule that does not use the given starting phrase*
Accept only if unambiguous
eg, accept
- Red = blue + 1
eg, do not accept
- 1 more on the red

✘ *Ambiguous rule*
eg
- − 1
- 1 below
- A number below the red dice
- The number lower than the red dice
- Followed by the number on the red dice

✘ *Incomplete rule*
eg
- Less than the number on the red dice

✘ *Rule not generalised*
Do not accept rules only shown through particular numerical examples
eg
- 2 − 1 = 1, 3 − 2 = 1, 4 − 3 = 1 etc

Perimeter and area

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
11	6					

| a | a | | | 1m | Indicates No and gives a correct explanation

The most common correct explanations: | **!** *Units given*
Ignore |

Quantify the areas
eg
- The area of the hexagon is 6 but the triangle is only 4
- The hexagon has two more triangles

✓ *Minimally acceptable explanation*
eg
- 6 and 4
- 2 more

✗ *Incomplete or incorrect explanation*
eg
- The hexagon is 6
- The hexagon has 5 triangles, the triangle has 4
- The hexagon has one more shape in it than the triangle

Interpret 'area'
eg
- Different amount of space inside
- Different numbers of triangles

✓ *Minimally acceptable explanation*
eg
- Count the triangles
- They have different numbers of shapes
- One has less triangles

! *Inaccurate description of shapes in an otherwise correct explanation*
Condone
eg, accept
- They have a different number of squares inside

✗ *Incomplete explanation that does not interpret area*
eg
- Different sizes
- Different numbers of dots
- Different

Identify which shape has the bigger area
eg
- The area of the hexagon is greater
- The triangle has a smaller area

✓ *Minimally acceptable explanation*
eg
- The hexagon is bigger
- The triangle is smaller
- The triangle has only 4

(U1)
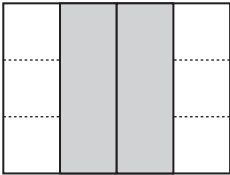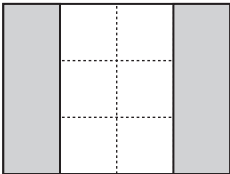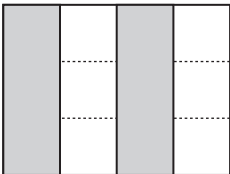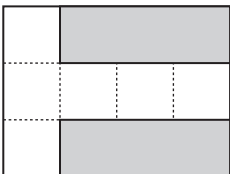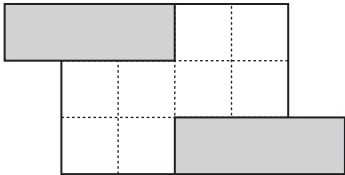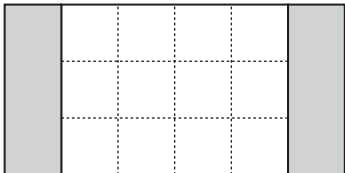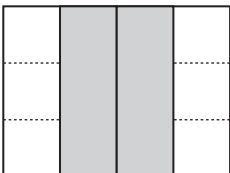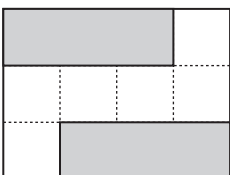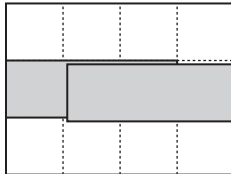
Perimeter and area (cont)

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
11	**6**					
b	b			**1m**	Indicates Yes and gives a correct explanation	**!** *Units given* Ignore
					The most common correct explanations:	
					Quantify the perimeters eg ■ The perimeter of both is 6 ■ They both have 6 along the sides	**!** *Perimeters measured* Accept values between 8.4cm and 9.6cm inclusive, even if units are not given ✓ *Minimally acceptable explanation* eg ◆ 6 and 6 ◆ Both 6 sides ✘ *Incorrect explanation* eg ◆ They have 5 lines round the sides
					Interpret 'perimeter' eg ■ Both have the same distance around the edges ■ The number along the sides is the same ■ Each side of the triangle = two sides of the hexagon	✓ *Minimally acceptable explanation* eg ◆ Same length edges ◆ Same amount of triangle sides ◆ Same number of dots ◆ Same number of points ◆ Dots to dots is the same ◆ Same number of sides between the dots ◆ I counted around them ✘ *Incomplete or ambiguous explanation* eg ◆ They are the same size ◆ They are both the same ◆ They take up the same number of squares ◆ Same number of sides ◆ I counted the sides ◆ I measured them **!** *Responses to parts (a) and (b) transposed but otherwise completely correct, even if there is incorrect use of words 'area' and 'perimeter'* Do not award the mark for part (a), but award the mark for part (b)
			(U1)			

Tier & Question					**Weighing**
3-5	**4-6**	**5-7**	**6-8**		
12	**7**			**Correct response**	**Additional guidance**

2m	1.2	✓ *Equivalent fractions and decimals*
or **1m**	Shows 2.4	
	or	
	Shows the digits 12	
	or	
	Shows or implies a complete correct method, with not more than one error eg ▪ $(5 - 2.6) ÷ 2$ ▪ $5 - 2.6$ then $÷ 2$ ▪ $5 - 2.6 = 3.4$ *(error)*, $3.4 ÷ 2 = 1.7$	**!** *For 1m, necessary brackets omitted* As this is a level 4 mark, condone eg, accept for 1m ◆ $5 - 2.6 ÷ 2$ **✗** *For 1m, incorrect order of subtraction* eg ◆ $2.6 - 5$ then $÷ 2$
(U1)		

Patterns

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
13	8	2				
a	a			1m	Shows two rectangles in a pattern with two lines of symmetry eg ■ ■	**!** *Lines of symmetry drawn* Ignore **!** *Rectangles not shaded* Accept only if unambiguous **!** *Edges of rectangles not explicit* Pupils may use the edge of the grid or not show an edge when the rectangles are adjacent. Accept only if unambiguous **!** *Rectangles placed within the grid but covering only parts of squares* Accept provided the pupil's intention is clear eg, for the first mark, accept ◆
b	b	a		1m	Shows two rectangles in a pattern with only one line of symmetry eg ■ ■	**!** *Rectangles placed with parts or all outside the grid* Accept provided the pupil's intention is clear eg, for the third mark, accept ◆ ◆
c	c	b		1m	Shows two rectangles in a pattern with rotation symmetry of order 2 eg ■ ■	**!** *Rectangles overlapping* Accept only if unambiguous eg, for the third mark, accept ◆ **!** *Incorrect size of rectangles* Do not treat as a misread, ie do not accept ✘ *Grid not taken to be part of the pattern*

Tier & Question						Simplifying	
3-5	4-6	5-7	6-8				
14	9	3			Correct response	Additional guidance	

	1m	$8k + 7$	✘ *Use of multiplication sign in simplified expressions* eg, for the first mark ◆ $8 \times k + 7$
	1m	$2k + 5$	✘ *Partially simplified expressions*

Tier & Question						Car parking	
3-5	4-6	5-7	6-8				
15	10	1			Correct response	Additional guidance	

	2m	Indicates the remaining five combinations in any order, with no duplicates and none incorrect eg ■	✓ *Zeros omitted*

eg (table in correct response):

10p	20p	50p
7	0	0
5	1	0
3	2	0
2	0	1
1	3	0
0	1	1

Additional guidance:

! *Amounts given rather than numbers of coins*
Accept provided the number of each type of coin is unambiguously implied
eg, for the combination 2　0　1, accept
◆

10p	20p	50p
10p 10p		50p

eg, for the combination 2　0　1, do not accept
◆

10p	20p	50p
20p		50p

or
1m　Indicates at least four correct combinations, with not more than one duplicated, incorrect or omitted

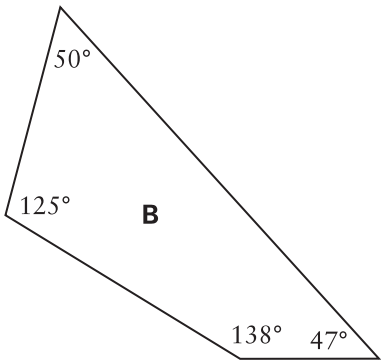| Tier & Question						Thinking fractions	
3-5	4-6	5-7	6-8				
16	11	4			Correct response	Additional guidance	
				1m	40		
				1m	150		
				1m	30		

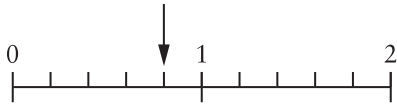| Tier & Question					*Marking overlay available*	Moving C	
3-5	4-6	5-7	6-8				
17	12	5			Correct response	Additional guidance	
a	a	a		1m	Gives correct coordinates eg ■ (6, any value except 6 or 1) ■ (4, 5) ■ (8, 5) ■ (4, −3) ■ (8, −3)	! *Use of overlay* As there is an infinite number of correct coordinates, a marking overlay is available for use if pupils give non-integer coordinates. Accept coordinates of any point that lies exactly on the straight line or on one of the circles, provided their point is neither (6, 6) nor on the same straight line as A and B	
b	b	b		1m	Gives correct coordinates, ie (4, 5) or (8, 5) or (6, 3) or (4, −3) or (8, −3) or (6, −1)	✓ *Same correct position used for part (b) as for part (a)*	

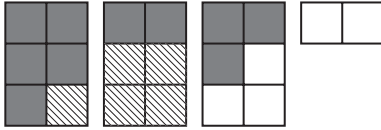| Tier & Question						Shoe sizes
3-5	4-6	5-7	6-8			
18	**13**	**6**			Correct response	Additional guidance
a	a	a	**1m**	6	
b	b	b	**1m** ⓤ1	2	

Tier & Question				*Marking overlay available*	Construction
3-5	4-6	5-7	6-8		
19	**14**	**7**		Correct response	Additional guidance
			2m	Constructs a completed triangle with the vertices in the regions indicated, and arcs within the tolerance, shown on the overlay	**!** *Longer arcs drawn than are shown on the overlay* Ignore inaccuracies in sections of arcs extending beyond those shown on the overlay
			or **1m**	Draws a completed triangle with the vertices in the regions indicated on the overlay, with either no arcs or incorrect arcs or Draws arcs that are within the tolerance shown on the overlay, even if there is an incorrect or no completed triangle	

Travel to work

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
20	15	8				

| a | a | a | | **2m** | £ 729(.00) | |

or
1m Shows the digits 729
eg
- 72900
- 72.90

or

Shows a complete correct method with not more than one computational error, but with the decimal point correctly positioned
eg
- 20 × 45 = 900
  16 × 45 = 8 × 90 = 720
  720 + 9
-     1620
        45
  —————
  64800
   8100
  —————
  73900 *(error)*   so £ 739

Additional guidance:

✘ *Conceptual error*
eg
-     1620
        45
  ————
  6480
  8100
  ————
  14580   so £ 145.80

grid method:

       1   6   2   0
0 | 0/4 | 2/4 | 0/8 | 0/0 | 4
7 | 0/5 | 3/0 | 1/0 | 0/0 | 5
(error) 1   9   0   0   So £ 719

| b | b | b | | **1m** | £ 14 | |

Tier & Question						Solving	
3-5	4-6	5-7	6-8		Correct response	Additional guidance	
21	16	9	1				

				1m	2	! *Throughout the question, incorrect notation* eg, as an answer for the first mark ◆ $k = \times 2$ Withhold one mark only for the first occurrence
				1m	$2\frac{1}{2}$ or equivalent	
				2m *or* 1m	$4\frac{1}{2}$ or equivalent Shows or implies a correct first step of algebraic manipulation that either reduces the number of terms or collects variables on one side of the equation and numbers on the other eg ■ $2t + 4 = 13$ ■ $3t = t + 9$ ■ $3t - t = 13 - 4$ ■ $2t = 9$	 ! *Method used is trial and improvement* Note that no partial credit can be given
				1m	-1	

Shapes

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
	17	10	2			

3m | All four angles correct and correctly positioned, ie

✓ Units omitted

! Units incorrect
eg
 ♦ 50%
Withhold one mark only for the first occurrence

or
2m | At least three angles correct and correctly positioned

or

All four correct angles shown but identification of which angle is which size is not clear

✓ Follow through
For 2m or 1m, follow through for 47° as
360 − sum of their other three angles
or
97 − their 50

or
1m | At least two angles correct and correctly positioned

Tier & Question				Correct response	Additional guidance
3-5	4-6	5-7	6-8	**Mixed numbers**	
	18	**11**	**3**		

| | a | a | a | **1m** | Gives the value $1\frac{4}{5}$ or $\frac{9}{5}$ or equivalent fraction or decimal | |

| | | | | **1m** | Indicates the correct position on the number line, ie

 0   1   ↓ 2 | **!** *Indication inaccurate*
 Accept provided the pupil's intention is clear

 ! *Follow through*
 Accept provided their incorrect value for the addition is between 0 and 2, but is not an integer

 eg, from $\frac{12}{15}$ for the first mark, accept

     ◆

 0   ↓ 1   2 |

| | b | b | b | **1m** | 20 | ✓ *Answer given as a fraction*
 eg
    ◆ $\frac{60}{3}$

 ✓ *Answer repeats sixths*
 eg
    ◆ $\frac{20}{6}$ |

Mixed numbers (cont)

Tier & Question					
3-5	4-6	5-7	6-8		
	18	11	3		

				Correct response	Additional guidance

	c	c	c	**2m** 4	✓ *Answer given as a fraction*
					eg
					    • $\dfrac{4}{1}$
					    • $\dfrac{60}{15}$
					
					! *Follow through*
					For 2m or 1m, accept their (b) ÷ 5 provided their (b) is a positive integer
					
					✗ *Conceptual error*
					eg
					    • $20 \div 5 = \dfrac{4}{6}$
					    • $\dfrac{20}{6} \div \dfrac{5}{6} = \dfrac{4}{6}$
					    • $\dfrac{10}{3} \times \dfrac{6}{5} = \dfrac{16}{15}$
					    • $\dfrac{1}{10} \times \dfrac{6}{5} = \dfrac{6}{50}$
					    • $3\dfrac{1}{3} \times \dfrac{6}{5} = 3\dfrac{6}{15}$

				or
				1m Shows a complete correct method with not more than one computational error
				eg
				  ■ $20 \div 5$
				  ■ $\dfrac{10}{3} \times \dfrac{6}{5} = \dfrac{60}{15} = 3$ *(error)*
				  ■
				  ■ $3\dfrac{1}{3} = \dfrac{7}{3}$ *(error)*, $\dfrac{7}{3} \times \dfrac{6}{5} = \dfrac{42}{15}$	

Tier & Question					Areas algebraically	
3-5	4-6	5-7	6-8			
	19	**12**	**4**		**Correct response**	**Additional guidance**
	a	a	a	**1m**	Gives a correct simplified expression for the area eg ■ $15ab$ ■ $15 \times a \times b$	
				1m	Gives a correct simplified expression for the perimeter eg ■ $6a + 10b$ ■ $2(3a + 5b)$ ■ $6 \times a + 10 \times b$ ■ $2 \times (3a + 5b)$	**!** *Partially simplified or unsimplified expressions* eg, for the area ♦ $3a5b$ eg, for the perimeter ♦ $2(3a) + 2(5b)$ ♦ $2 \times (3 \times a + 5 \times b)$ If both expressions are correct but are partially simplified or unsimplified, mark as 0, 1, provided neither has subsequently been incorrectly simplified **!** *Expressions transposed but otherwise correct and simplified* Mark as 0, 1
	b	b	b	**1m**	Gives both correct dimensions in either order, ie $4a$ and $3a$	**!** *Correct dimensions embedded* Accept provided both the area and perimeter have been considered eg, accept ♦ $12a^2 = 3a \times 4a$ $14a = 2(3a + 4a)$ **!** *Dimensions labelled as length or width* Ignore

Tier & Question						
3-5	4-6	5-7	6-8		**Arranging**	
	20	**13**	**5**		**Correct response**	**Additional guidance**

| | a | a | a | **1m** | Gives a correct arrangement using each of the numbers 1 to 6 once only, ie for each 3 digit number: | |

hundreds   tens   units

| 5 or 6 | 2 or 4 | 1 or 3 |

eg
- 543 + 621
- 641 + 523

(U1)

1m   Gives a correct arrangement using each of the numbers 1 to 6 once only, ie for each 3 digit number:

hundreds   tens   units

| 2 or 5 | 1 or 3 | 4 or 6 |

eg
- 514 + 236
- 216 + 534

(U1)

	b	b	b	**1m**	536 − 421 or 356 − 241	✘ *Incorrect order of subtraction*
						eg
						◆ 421 − 536
				(U1)		

Tier & Question					Lines on a square	
3-5	4-6	5-7	6-8			
	21	14	6		**Correct response**	**Additional guidance**
		a	a	2m	Matches all three equations correctly, ie	✘ *Any equation matched more than once*

				or 1m	Matches any two equations correctly	
		b	b	1m	Gives a correct equation eg ■ $x = 1$	

Tier & Question						
3-5	4-6	5-7	6-8			

Lines on a square (cont)

	21	**14**	**6**			
		c	c	**1m**	**Correct response**	**Additional guidance**

		c	c	**1m**	Indicates No and gives a correct explanation

Correct response

Indicates No and gives a correct explanation

The most common correct explanations:

Give a correct equation of the line through E and G
eg
- It should be $y = x$

Refer to gradients
eg
- Gradient of EG is 1 but the gradient of $y = -x$ is -1
- Gradient of EG is positive but the gradient of $y = -x$ is negative
- EG is the wrong diagonal for a negative gradient

Give a counter-example
eg
- The point $(1, 1)$ is on the line, but $1 \neq -1$
- $(1, -1)$ works for $y = -x$, but is not on the line
- E is $(1, 1)$, but that's $x = y$
- At $(1, 1)$, x and y are equal
- At $(1, 1)$, x and y have the same sign
-

x	1	2
y	-1	-2

these points are not on EG

Identify the line with equation $y = -x$
eg
- $y = -x$ is the other diagonal through H and F
- $y = -x$ does not exist in the first quadrant
- $y = -x$ marked on graph

(U1)

Additional guidance

✓ *Minimally acceptable explanation*
eg
- EG slopes up but $y = -x$ slopes down
- At E (or G) y is not $-x$
- If you put in E's coordinates, it doesn't work

✗ *Incomplete explanation*
eg
- Gradient of EG is 1
- $y = -x$ slopes down
- $1 \neq -1$
- $x = 1, y = 1$
-

x	0	1	2	3
y	0	1	2	3

- Because each point has the same numbers $(1, 1)$, $(2, 2)$ etc
- If you put in coordinates, it doesn't work

Scatter graphs

Tier & Question					Correct response	Additional guidance
3-5	**4-6**	**5-7**	**6-8**			
	22	**15**	**7**			
	a	a	a	**1m**	Indicates a positive correlation eg ■ There is positive correlation between diameter and height ■ As diameter increases, height increases ■ Higher trees have wider trunks ■ Bigger trees are fatter ■ They both increase together	✓ *Minimally acceptable response* eg ◆ Big trees have big diameters ✗ *Incomplete response* eg ◆ It's positive ◆ Big trees have big heights ◆ Higher trees are bigger ✗ *Incorrect reference to proportion* eg ◆ It's directly proportional
	b	b	b	**1m**	Gives a correct explanation The most common correct explanations: Refer to the trend in the data eg ■ It would be too far away from the other points ■ It would be an outlier ■ It doesn't fit the general trend ■ It would be a long way from the line of best fit ■ This diameter is far too big for the height ■ It is too small to have such a big diameter Give a value for the height or diameter if the tree were a poplar eg ■ If it was a poplar you would expect it to be about 6 metres high ■ Poplars that are 3m high are only about 2cm in diameter	✓ *Minimally acceptable explanation* eg ◆ It's on its own on the graph ◆ It doesn't fit the correlation ◆ It doesn't fit the pattern ◆ It doesn't have the same relationship ◆ The diameter in cm is bigger than the height in m ◆ The diameter is big but the height is small ✗ *Incomplete or incorrect explanation* eg ◆ It's different from the others ◆ It's on its own ◆ It doesn't fit the graph ◆ Poplar trees are tall and thin ◆ It would not be on the line of best fit ◆ It's not in the same range ◆ The diameter is too big ◆ Poplar trees don't have diameters bigger than their height ◆ For poplars, diameter + 1 = height ! *Height for diameter of 5cm given* Accept values in the range 5.5m to 7m inclusive ! *Diameter for height of 3m given* Accept values in the range 1cm to 2.3cm inclusive
	c	c	c	**1m**	Indicates a value between 4 and 5.2 inclusive	
		d	d	**2m** *or* **1m**	Indicates that all four statements are false Makes three correct decisions	! *Indication other than ticks* Accept only if unambiguous

Winning ticket

Tier & Question						Correct response	Additional guidance
3-5	4-6	5-7	6-8				
		16	**8**				

						Correct response	Additional guidance
		a	a	**1m**		Gives a correct probability eg • $\dfrac{75}{245}$ • $\dfrac{15}{49}$ • 0.306(...) • 31%	**!** *Answer of 0.3(0) or 30%* Accept provided a correct method or a more accurate value is seen **✗** *Incorrect method* eg • 3 colours so $\dfrac{1}{3} = 0.3$
		b	b	**1m**		Gives a correct probability eg • $\dfrac{3}{245}$	**!** *Follow through* Accept follow through from an incorrect total number of tickets seen in part (a), provided their total is not 3 or 100 eg, from $\dfrac{75}{255}$ for part (a), accept • $\dfrac{3}{255}$ **!** *Decimal or percentage value* Accept 0.01 or 0.012(…), or the equivalent percentages, provided no incorrect method is seen
		c	c	**1m**		$\dfrac{1}{3}$ or equivalent probability	**!** *Decimal or percentage value* Accept 0.33 or better, or the equivalent percentages

Journeys

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
		17	9			
		a	a	1m	Indicates 60 miles per hour or 1 mile per minute	✓ *Equivalent fractions or decimals* ! *Throughout the question, pupils unambiguously working in miles per hour or miles per minute but some or all of the units are omitted* At least 2 of the 3 correct values (ie 60, 30, 40 or 1, $\frac{1}{2}$, $\frac{2}{3}$) must be shown. If correct units are shown once within the question condone other omissions. Otherwise withhold only the first mark that would otherwise have been awarded eg, for parts (a), (b) and (c) respectively ◆ 60, 30mph, 40 Mark as 1; 1; 1, 1 ◆ *50 (error)*, 30, 40 Mark as 0; 0; 1, 1 ◆ 60, 30, *45 (error)* Mark as 0; 1; 0, 0 ◆ 1, $\frac{1}{2}$, *1.5 (error)* Mark as 0; 1; 0, 0 Note that the marking of these last two examples assumes there is no working shown that might allow partial credit for part (c)

		b	b	1m	Indicates 30 miles per hour or $\frac{1}{2}$ mile per minute	! *Unconventional expression or abbreviation of units*
						 Accept provided unambiguous and expressed as a unitary rate, including the use of m for miles
						 eg, for part (a), accept
						 ◆ 1m per min
						 ◆ 60 miles each hour
						 If ambiguous, mark as if units omitted
						 eg, for part (b)
						 ◆ 0.5 mpm
						
						 ! *Incorrect units*
						 eg, for part (a)
						 ◆ 1 mph
						 Mark as if units omitted
						
						 ! *Rate of travel expressed as time per unit distance*
						 eg
						 ◆ 1 minute per mile (part (a))
						    2 minutes per mile (part (b))
						    1.5 minutes per mile (part (c))
						 If the values shown are as above and correct units are shown at least once, mark as 0; 0; 1, 1
						 Otherwise do not accept
						
						 ✗ *Non-unitary rates*
						 eg, for part (b)
						 ◆ 1 mile every two minutes

Journeys (cont)

Tier & Question				
3-5	4-6	5-7	6-8	
		17	**9**	

			Correct response	Additional guidance
	c	c	**2m** Indicates 40 miles per hour or $\frac{2}{3}$ mile per minute	Note to markers: Apply the additional guidance from parts (a) and (b) to part (c)

! Answer given in miles per minute and rounded or truncated
In this context, accept rounding or truncation to two or more decimal places. For 2m, do not accept an answer of 0.6 or 0.7 unless a correct method or a more accurate value is seen

or
1m Shows or implies a complete correct method for calculating the speed in miles per hour or miles per minute
eg
- $20 \div 30 \times 60$
- 20×2
- $20 \div 30$

or

Indicates a correct speed in miles per minute, rounded or truncated to one decimal place
eg
- 0.6 miles per minute
- 0.7 miles per minute

✘ For 1m, method leading to rate of travel as time per distance
eg
- $30 \div 20$

✘ For 1m, incomplete method
eg
- 20 miles in 30 minutes, so 2 miles per 3 minutes

Different ways

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
		18	**10**			

	a	a	**3m**	Indicates correct decisions for all six statements, ie	✓ *Unambiguous indication*

Indicates correct decisions for all six statements, ie

☐ T   ✓ F   ☐ T   ✓ F

✓ T   ☐ F   ✓ T   ☐ F

✓ T   ☐ F   ✓ T   ☐ F

or
2m

Indicates correct decisions for five statements

or
1m

Indicates the correct decision for at least one of the false statements, and makes at least three other correct decisions
eg

■   ☐ T   ✓ F   ✓ T   ☐ F *(error)*

✓ T   ☐ F   ✓ T   ☐ F

✓ T   ☐ F   ☐ T   ✓ F *(error)*

Additional guidance:

✓ *Unambiguous indication*
  eg
   ◆ ✓ for True and ✗ for False

---

b b 1m   Gives a correct explanation

The most common correct explanations:

Refer explicitly or implicitly to the more efficient method of algebraic manipulation suggested by part (a)
eg
  ■ You can solve the equation quickly by doing the same thing to both sides of the equation
  ■ Because $2x = 3$, $x = 1\frac{1}{2}$

Refer to the time taken or the number of trials needed
eg
  ■ Takes a long time
  ■ You need to try lots of values
  ■ It is inefficient

Refer to the difficulty of finding an exact answer
eg
  ■ If there are lots of decimal places it might be hard to be exact

(U1)

Additional guidance:

✓ *Minimally acceptable explanation*
  eg
   ◆ Using algebra is better
   ◆ Decimal answers can be hard to find
   ◆ It can be inaccurate

! *Incomplete explanation*
  eg
   ◆ There is a better method
   ◆ The answer is always one value
   ◆ Easy to make a mistake
   ◆ It is inaccurate
   ◆ It's like guess work
   ◆ You could go on forever
Do not accept unless alongside a correct explanation

Locus of points

Tier & Question					*Marking overlay available*	
3-5	4-6	5-7	6-8			
		19	**11**		**Correct response**	**Additional guidance**
		a	a	**1m**	Indicates the two points of intersection of the circles with radius 4cm, within the tolerance as shown on the overlay	**!** *More than two points indicated* Ignore additional points that are equidistant from A and B, as these may be working for part (b). Ignore other additional points provided it is clear which two points are the pupil's answer for part (a)
		b	b	**1m**	Draws a straight line that fulfils the following three conditions below: 1. Ruled 2. Within the tolerance as shown on the overlay 3. Extended to at least both the 6cm circles as shown on the overlay	**✘** *Shading, or additional lines or curves marked* **✘** *Line indicated by a series of points or shown dashed or dotted*

Evens or odds

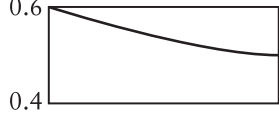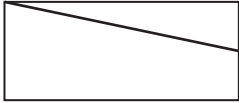| Tier & Question						
3-5	4-6	5-7	6-8			
		20	**12**		**Correct response**	**Additional guidance**
		a	a	**1m** (U1)	Indicates $(x-2)^2$ is even, ie ☑ ☐ and gives a correct explanation eg ■ Subtracting an even number keeps it even, and any even number multiplied by any even number stays even ■ $(x-2)$ is even, an even number squared is even ■ -2 and it stays even, × by itself and it's still even ■ Even − even = even, even × even = even ■ Even − even = even, and even multiplied by even or odd is even	**✓** *Minimally acceptable explanation* eg, for part (a) ◆ Even × even is even eg, for part (b) ◆ Odd × odd is odd ◆ It's $x^2 - 1$ and x^2 is even ◆ The difference between an even square and an odd square is always odd **!** *Explanation lacks generality* eg, for part (a) ◆ If $x = 6$, $(x-2)^2 = 16$ which is even Do not accept unless alongside a correct explanation
		b	b	**1m** (U1)	Indicates $(x-1)(x+1)$ is odd, ie ☐ ☑ and gives a correct explanation eg ■ Adding or subtracting 1 makes it odd, and odd × odd = odd ■ $(x-1)$ is odd, $(x+1)$ is odd, so multiplied together the answer is odd ■ Even − odd = odd, even + odd = odd, odd × odd = odd ■ $x^2 - 1$ is one less than an even number ■ It's $x^2 - 1$ and the difference between an even square and an odd square is always odd	**✘** *Incomplete explanation* eg, for part (a) ◆ $(x-2)$ is even eg, for part (b) ◆ Adding or subtracting 1 makes it odd

Straight line

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
			13			

a **1m**

Gives a correct explanation

eg

- Right-angled triangle drawn on graph, with correct dimensions which are then used for height ÷ base
- $\dfrac{\text{Change in } y}{\text{Change in } x} = \dfrac{5}{10}$
- 6 right, 3 up, so 3 ÷ 6
- Half a square up for every one square along
- (10, 6) is on the line, so $6 = 10m + 1$
  $$10m = 5$$
  $$m = 0.5$$

Additional guidance:

✓ *Correct description of method*

eg

- ◆ You draw a right-angled triangle on the line, then you divide height by base

✓ *Minimally acceptable explanation*

eg

- ◆ Right-angled triangle drawn on graph, with correct dimensions labelled
- ◆ $\dfrac{y}{x} = \dfrac{5}{10}$
- ◆ 6 right, 3 up
- ◆ Half a square up each time

! *Units given*
Ignore

✗ *Incomplete explanation*

eg

- ◆ $\dfrac{5}{10}$
- ◆ It's 1 on the y-axis, -2 on the x-axis, and $1 \div 2 = 0.5$

---

b **2m**

Gives a correct equation

eg

- $y = \dfrac{1}{2}x + 1$
- $y = 0.5x + 1$
- $2y - x = 2$

or
1m

$\dfrac{1}{2}x$, or equivalent, seen

eg

- $\dfrac{1}{2}x + 1$

or

Shows understanding that the equation is of the form $y = mx + c$ and that $m = \dfrac{1}{2}$ and $c = 1$, even if there are subsequent errors

eg

- $y = mx + c$
  $y = 0.5 + 1$ *(error)*

---

c **1m**

Gives any equation equivalent to $y = \dfrac{1}{2}x + c$,

where c is any value other than 1

eg

- $y = \dfrac{1}{2}x - 7$
- $y = 0.5x + 5$
- $2y = x$

Additional guidance:

! *Follow through from part (b)*
Accept an equation of a line parallel to their (b), provided the equations contain both the variables x and y
eg, from $y = 2x + 1$ for part (b), accept
- ◆ $y = 2x + 4$

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8			
			14			**Theme park**

					Correct response	Additional guidance
			a	**1m**	Gives a value between 27.5 and 28.5 inclusive	
			b	**2m**	Gives a value between 16 and 18 inclusive	
				or **1m**	Identifies both the upper quartile age as a value between 37.5 and 38.5 inclusive and the lower quartile age as a value between 20.5 and 21.5 inclusive or On the graph, indicates on the *x*-axis two correct points corresponding to one value between 37.5 and 38.5 inclusive, and one value between 20.5 and 21.5 inclusive, even if the values are not stated or are stated incorrectly	**!** *More than two points indicated on the x-axis* Ignore a point intended to correspond to the median. Otherwise do not accept
			c	**1m**	Gives a correct statement of comparison, interpreting the data eg ■ On average, younger people went to the theme park ■ There was not as much variation of age at the theme park ■ Older people tended to go to the flower show ■ More people from different age groups went to the flower show	✓ *Follow through from incorrect values for parts (a) or (b)* ✓ *Minimally acceptable statement* eg ◆ The average age was higher at the flower show ◆ Younger people went to the theme park ◆ The theme park had people closer to each other in age **!** *Comparison with the theme park is implicit* Given the wording of the question, condone eg, accept ◆ Older people tended to go ✘ *No interpretation of the median or IQR within the context given* eg ◆ The median age in the theme park is lower ◆ The range was higher at the flower show ✘ *Incorrect statement* eg ◆ People at the theme park were between 20 and 40 but people at the flower show were between 30 and 60 ◆ Young people went to the theme park but did not go to the flower show

Tier & Question					
3-5	4-6	5-7	6-8		

Inequality

			15		**Correct response**	**Additional guidance**

a   **2m**

$y < -2$

or
1m

Shows or implies a correct first step of algebraic manipulation

eg

- $\dfrac{2y + 7}{3} < 1$

- $2(2y + 7) < 6$

- $\dfrac{4y + 14}{3} < 2$

- $2y + 7 < 3$

or

Identifies the value −2 even if the inequality sign is incorrect or omitted

eg

- $y > -2$
- $y = -2$
- -2

2m

$y < 2$

or
1m

Shows or implies a correct first step of algebraic manipulation

eg

- $\dfrac{7 - 2y}{12} > \dfrac{1}{4}$

- $4(7 - 2y) > 12$

- $\dfrac{28 - 8y}{12} > 1$

- $7 - 2y > 3$

- $\dfrac{7 - 2y}{3} > 1$

or

Identifies the value 2 even if the inequality sign is incorrect or omitted

eg

- $y > 2$
- $y = 2$
- 2

Additional guidance:

! *Solution not given in terms of y*
eg, for the first inequality
- $-y > 2$
Mark as 1, 0

! *Incomplete processing*
eg, for the first inequality

- $y < \dfrac{-4}{2}$

Mark as 1, 0

✓ *For 1m, algebraic manipulation of the corresponding equation, rather than the inequality*
eg, for the first inequality
- $\dfrac{2y + 7}{3} = 1$

eg, for the second inequality
- $7 - 2y = 3$

✓ *For 1m, value embedded*
eg, for the first inequality
- $2 \times -2 + 7 < 3$

Tier & Question				
3-5	4-6	5-7	6-8	

Inequality (cont)

| | | 15 | | | **Correct response** | **Additional guidance** |

| | b | 1m |

Gives a correct explanation

The most common correct explanations:

Give the correct solution
eg

- $-3 < y < 3$
- It's only true if y is between -3 and 3
- y must be bigger than -3 as well

Give a counter-example
eg

- -4 is less than 3 but $16 > 9$
- If you square minus 8 the answer isn't less than 9

(U1)

✓ *Minimally acceptable explanation*
eg

- Numbers less than -3 don't work
- $(-5)^2 > 9$
- $-4 \times -4 = 16$
- It's not true for -7

✗ *Incomplete explanation*
eg

- When you square a negative number, the answer is positive
- $\sqrt{9} = 3$

Tier & Question						

<table>
<tr><td colspan="4">Tier & Question</td><td colspan="3" rowspan="2" style="text-align:right">Angle proof</td></tr>
<tr><td>3-5</td><td>4-6</td><td>5-7</td><td>6-8</td></tr>
<tr><td></td><td></td><td></td><td>16</td><td></td><td style="text-align:center">Correct response</td><td style="text-align:center">Additional guidance</td></tr>
<tr>
<td></td><td></td><td></td><td>a</td><td>1m</td>
<td>

Gives a correct explanation
eg

- BO and OA are radii, so triangle OBA is isosceles, so ∠ABO = ∠BAO. The same is true of CO and OB, so ∠BCO = ∠OBC
- Both triangles are isosceles because two of their sides are radii of the circle
- Triangle AOB is isosceles because O is the centre and A and B are on the circumference, and so is triangle BOC

(U1)
</td>
<td>

✓ *Minimally acceptable explanation*
eg

- BO and OA are radii, so ∠ABO = ∠BAO. The same is true of CO and OB

! *Explanation correct but only refers to one of ∠ABO or ∠CBO*
As the explanations are essentially the same for both angles, condone

✗ *Incomplete explanation that does not explain why the triangles are isosceles*
eg

- OC = OB, so ∠OCB = ∠OBC, and the same for ∠ABO
- Both triangles are isosceles
</td>
</tr>
<tr>
<td></td><td></td><td></td><td>b</td><td>1m</td>
<td>

Gives a correct proof
eg

- $x + x + y + y = 180$
  $2x + 2y = 180$
  so $x + y = 90 = ∠CBA$

(U1)
</td>
<td>

✓ *Minimally acceptable justification*
eg

- $x + x + y + y = 180$, so $x + y = 90$
</td>
</tr>
</table>

Computer game

Tier & Question					Correct response	Additional guidance
3-5	4-6	5-7	6-8	**17**		

	Correct response	Additional guidance
a **1m**	Indicates W, L, L	✓ *Unambiguous indication* eg ⬧ 1, 0, 0
b **1m**	45	! *Qualifier used* eg ⬧ About 45 Accept, even though the exact value can be determined from the information given
c **1m**	0.6 (0.02) or equivalent probability	✓ *Qualifier used* eg ⬧ About 60%

d **1m**	Joins (100, 0.6) to (120, 0.5) using a curve with negative but increasing gradient, or by marking and joining any number of individual points on such a curve
	eg
	
		! *Point (120, 0.5) not accurately marked*
		Accept if on line $x = 120$ and within 1mm of correct height
		
		! *Part(s) of curve with incorrect gradient*
		Condone use of a straight line, ruled or unruled, ie
		
		However do not accept other incorrect gradients
		eg
		  ⬧
		(decreasing gradient)
		
		  ⬧
		(gradient stops increasing)
		
		  ⬧
		(gradient positive in parts)

Index to mark schemes

Index to mark schemes

EARLY YEARS

NATIONAL CURRICULUM 5–16

GCSE

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GCE A LEVEL

NVQ

OTHER VOCATIONAL QUALIFICATIONS

254655