EARLY YEARS

NATIONAL CURRICULUM 5–16

GCSE

GNVQ

GCE A LEVEL

NVQ

OTHER VOCATIONAL QUALIFICATIONS

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KEY STAGE 3

ALL TIERS

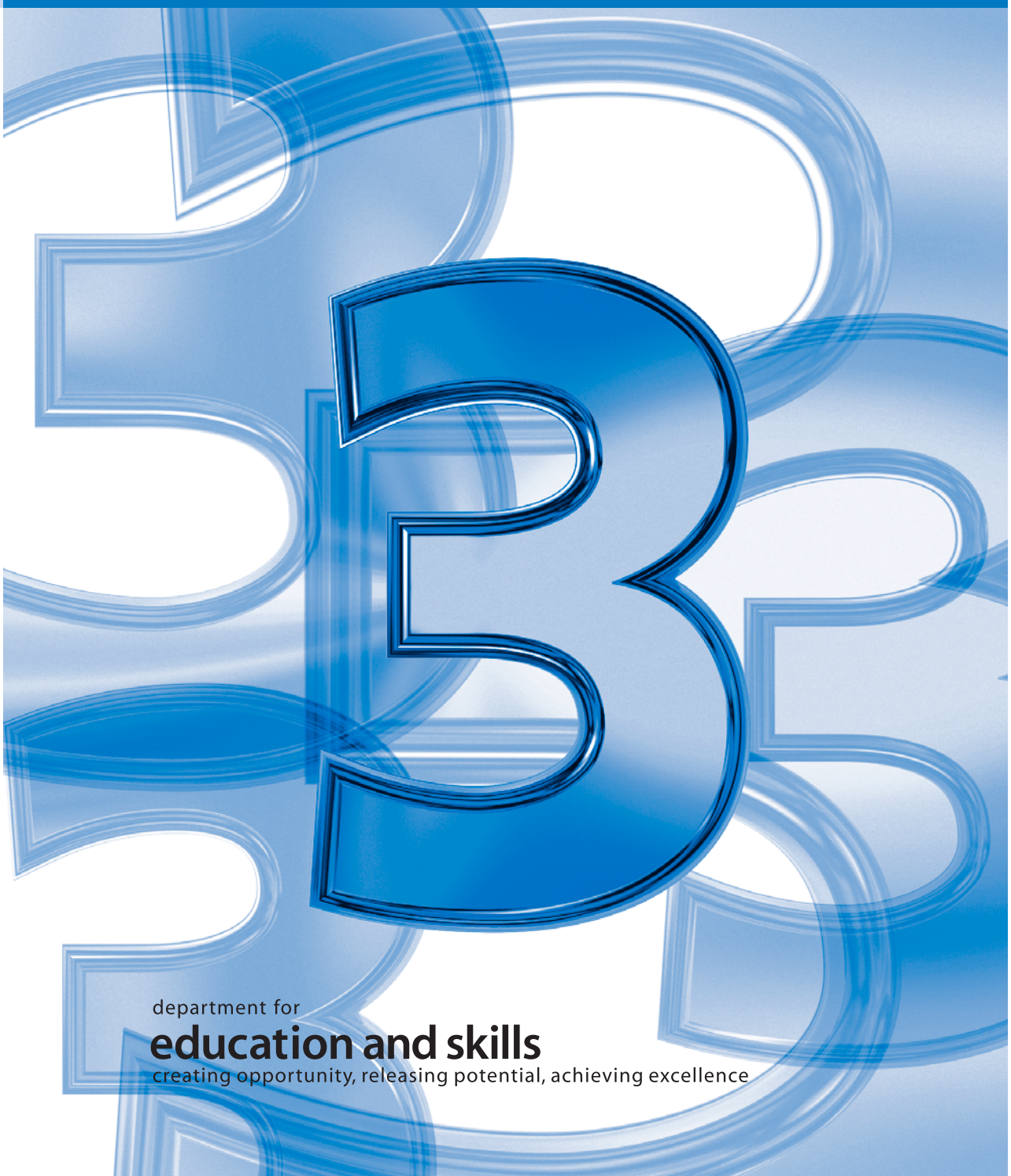
2005

Mathematics tests

Mark scheme for Paper 1

Tiers 3–5, 4–6, 5–7 and 6–8

2005



QCA

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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 12 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.

For graphical and diagrammatic responses, including those in which judgements on accuracy are required, marking overlays have been provided as the centre pages of this booklet.

The 2005 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, algebra, coordinates, negative numbers 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 ...

<table>
<tr><td rowspan="4">The final answer is wrong but the correct answer is shown in the working.</td><td>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;</td><td>If so, award the mark.</td></tr>
<tr><td>in questions not testing accuracy, the correct answer has been given but then rounded or truncated;</td><td>If so, award the mark.</td></tr>
<tr><td>the pupil has continued to give redundant extra working which does not contradict work already done;</td><td>If so, award the mark.</td></tr>
<tr><td>the pupil has continued, in the same part of the question, to give redundant extra working which does contradict work already done.</td><td>If so, do not award the mark. Where a question part carries more than one mark, only the final mark should be withheld.</td></tr>
<tr><td>The pupil's answer is correct but the wrong working is seen.</td><td colspan="2">A correct response should always be marked as correct unless the mark scheme states otherwise.</td></tr>
<tr><td>The correct response has been crossed or rubbed out and not replaced.</td><td colspan="2">Mark, according to the mark scheme, any legible crossed or rubbed out work that has not been replaced.</td></tr>
<tr><td>More than one answer is given.</td><td colspan="2">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.</td></tr>
<tr><td>The answer is correct but, in a later part of the question, the pupil has contradicted this response.</td><td colspan="2">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.</td></tr>
</table>

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	× Incorrect or ambiguous use of pounds or pence eg £320, £320p or £700p, or 3.20 or 3.20p not in the answer space.
✓ 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 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	× Incorrect or ambiguous time interval eg 2.3(h), 2.30, 2-30, 2h 3, 2.30min
✓ Digital electronic time ie 2:30	! 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	× Incorrect time eg 8.4am, 8.40pm
✓ Unambiguous change to 12 or 24 hour clock eg 17:20 as 5:20pm, 17:20pm	× Incorrect placement of separators, spaces, etc or incorrect use or omission of 0 eg 840, 8:4:0, 084, 84

Responses involving the use of algebra

For example: $2 + n$ $n + 2$ $2n$ $\frac{n}{2}$ n^2

Accept ✓	Take care ! Do not accept ×
✓ Unambiguous use of a different case or variable eg N used for n x used for n	! Unconventional notation eg $n \times 2$ or $2 \times n$ or $n2$ or $n + n$ for $2n$ $n \times n$ for n^2 $n \div 2$ for $\frac{n}{2}$ or $\frac{1}{2}\ n$ $2 + 1n$ for $2 + n$ $2 + 0n$ for 2 Within a question that demands simplification, do not accept as part of a final answer involving algebra. Accept within a method when awarding partial credit, or within an explanation or general working. × Embedded values given when solving equations eg in solving $3x + 2 = 32$, $3 \times 10 + 2 = 32$ for $x = 10$ To avoid penalising the two types of error below 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.
✓ Words used to precede or follow equations or expressions eg $t = n + 2$ tiles or tiles = $t = n + 2$ for $t = n + 2$	! Words or units used within equations or expressions eg n tiles + 2 n cm + 2 Do not accept on their own. Ignore if accompanying an acceptable response.
✓ Unambiguous letters used to indicate expressions eg $t = n + 2$ for $n + 2$	× Ambiguous letters used to indicate expressions eg $n = n + 2$ for $n + 2$

Responses involving coordinates *For example: (5, 7)*	
Accept ✓	**Do not accept ×**
✓ Unconventional notation eg (05, 07) (five, seven) ($\overset{x}{5}$, $\overset{y}{7}$) (x=5, y=7)	× Incorrect or ambiguous notation eg (7, 5) ($\overset{y}{7}$, $\overset{x}{5}$) (5x, 7y) (5^x, 7^y) ($x - 5$, $y - 7$)

Responses involving negative numbers *For example: –2*	
Accept ✓	**Do not accept ×**
	To avoid penalising the error below more than once within each question, do not award the mark for the *first* occurrence of the error within each question. Where a question part carries more than one mark, only the final mark should be withheld. × Incorrect notation eg 2–

Responses involving probability

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

For example: 0.7 or $\frac{7}{10}$ or 70%

Accept ✓	Take care ! Do not accept ×
✓ Equivalent decimals, fractions and percentages eg 0.700, $\frac{70}{100}$, $\frac{35}{50}$, 70.0%	The first **four** categories of error below should be ignored if accompanied by an acceptable response, but should not be accepted on their own. However, to avoid penalising the first **three** types of error below 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 correctly expressed in one acceptable form which is then incorrectly converted, but is still less than 1 and greater than 0 eg $\frac{70}{100} = \frac{18}{25}$	! A probability that is incorrectly expressed eg 7 in 10 7 over 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.
	! 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 each of tiers 3–5 and 4–6.
A total of 121 marks is available in each of tiers 5–7 and 6–8.

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 20 June 2005. 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.

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Tier & Question					Average heights	
3-5	4-6	5-7	6-8			
1					**Correct response**	**Additional guidance**
a				**1m**	133	
b				**1m**	7	

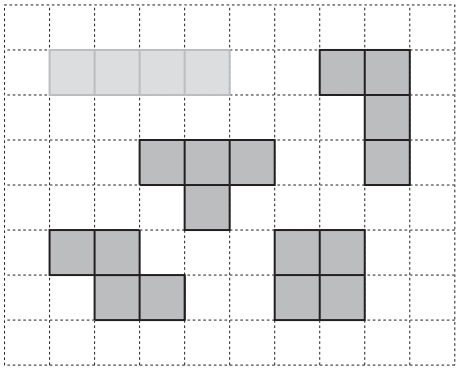
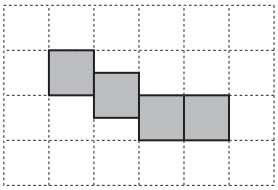
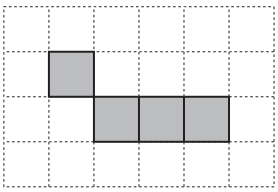
Tier & Question					Making 24	
3-5	4-6	5-7	6-8			
2					**Correct response**	**Additional guidance**
				2m	Gives three different correct pairs of numbers eg ▪ 2 × 12 3 × 8 4 × 6 ▪ 24 × 1 12 × 2 6 × 4	✓ *Fractions, decimals or negative numbers* ! *For 2m or 1m, correct pair of numbers repeated, but in reverse order* Do not accept as a different correct pair
				or **1m**	Gives two different correct pairs of numbers	

Tier & Question					Write a number	
3-5	4-6	5-7	6-8			
3					**Correct response**	**Additional guidance**
a				**1m**	Gives a value that is greater than 1000, but less than 1100 eg ■ 1001 ■ 1099	✓ *Fractions or decimals* × *For part (a), number given in words*
b				**1m**	Gives a decimal that is greater than 0, but less than 1 eg ■ 0.5 ■ 0.12 ■ Point two	× *For part (b), number given as a fraction*

Tier & Question					3-D shapes	
3-5	4-6	5-7	6-8			
4					**Correct response**	**Additional guidance**
a				**1m**	Indicates C	! *Unambiguous indication* Accept eg, for part (b) accept ◆ Cube and cuboid eg, for part (b) do not accept ◆ Square and rectangle
b				**1m**	Indicates A and E in either order	
c				**1m**	7	

Tier & Question						Digits
3-5	4-6	5-7	6-8			
5					**Correct response**	**Additional guidance**
a				**1m**	Gives all four correct numbers, ie 537 573 735 753 in any order	
b				**1m**	Identifies the smallest and the biggest numbers from their list (including the two given numbers), provided their list has at least four numbers	✓ *For both marks, follow through*
				1m	Correctly adds any numbers they identify, even if they are not from their list, provided their numbers each have at least three digits and the addition requires at least one 'carry' eg ■ 357 + 753 = 1110 ■ 537 + 753 = 1290 ■ 333 + 777 = 1110 ■ 357 + 375 + 537 + 573 + 735 + 753 = 3330 or Gives the value 1110, without identifying their smallest and biggest numbers	Markers may find the following sums using the values from a correct list useful:

+	357				
357	–	375			
375	732	–	537		
537	894	912	–	573	
573	930	948	1110	–	735
735	1092	1110	1272	1308	–
753	**1110**	1128	1290	1326	1488

Tier & Question					Different shapes	
3-5	4-6	5-7	6-8			
6					**Correct response**	**Additional guidance**
				3m	Gives all four different correct shapes in any orientations with none incorrect or duplicated eg ▪ 	! *Lines not ruled or accurate, shapes not shaded or internal lines omitted* Accept provided the pupil's intention is clear ! *For 3m, correct shapes duplicated even if orientation is different* Condone duplication of the given shape, ie a 1 by 4 rectangle For 3m, do not accept other duplicates × *Squares not joined correctly side-to-side* Do not accept as a correct shape eg ◆  ◆ 
				or **2m**	Gives at least three different correct shapes, even if there are other incorrect or duplicated shapes	
				or **1m** U1	Gives two different correct shapes, even if there are other incorrect or duplicated shapes	

Tier & Question						
3-5	4-6	5-7	6-8			**Food and drink**
7					**Correct response**	**Additional guidance**
a				**1m**	£ 1.55	
b				**2m**	Indicates the correct item of food and the correct drink, ie Pizza and juice, in either order	✓ *Unambiguous indication* eg • P, J
				or		
				1m (U1)	Shows the digits 24(0)	

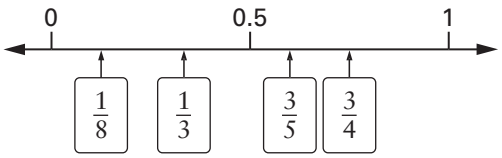
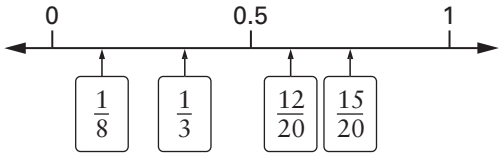
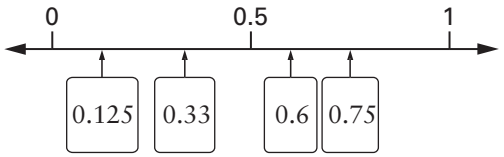
Tier & Question						
3-5	4-6	5-7	6-8			**Number lines**
8	**1**				**Correct response**	**Additional guidance**
				1m	53	
				1m	17	
				1m	–5	
				2m	Gives both the values –9 and (+)3 in the correct positions	
				or		
				1m	Gives one correct value in the correct position or Gives both the values (+)3 and –9 but with the positions reversed	

Tier & Question					**Shapes**	
3-5	4-6	5-7	6-8			
9	**2**				**Correct response**	**Additional guidance**
				2m	Gives all three correct areas, ie 16 4 8	
				or **1m**	Gives any two correct areas	! *For 1m, follow through* Provided their 2nd < their 3rd < their 1st, accept the following: For their 2nd, accept follow through as their 1st ÷ 4 For their 3rd, accept follow through as their 1st ÷ 2 or their 2nd × 2 eg, for 1m accept • *20 (error)*, 5, 10 • *1 (error)*, $\frac{1}{4}$, $\frac{1}{2}$ • 16, *2 (error)*, 4 eg, for 1m do not accept • 16, *8 (error)*, 16

Tier & Question					**Computation**	
3-5	4-6	5-7	6-8			
10	**3**				**Correct response**	**Additional guidance**
a	a			**1m**	10.2 or equivalent	
b	b			**1m**	9.5 or equivalent	
c	c			**1m**	1270	
d	d			**1m**	57	

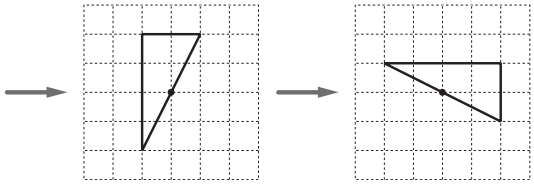
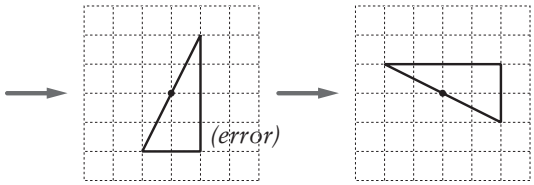
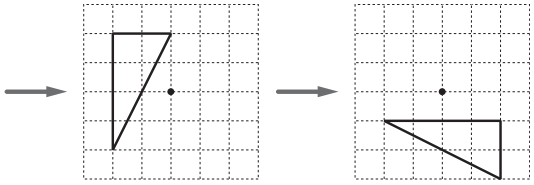
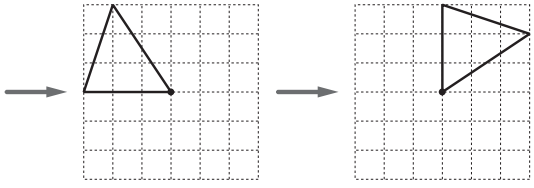
Tier & Question					Scales	
3-5	4-6	5-7	6-8			
11	4				Correct response	Additional guidance
a	a			**1m**	900	
				1m	200	! *Follow through* Accept follow through as 1100 – their value for the first mark, provided this gives a positive value
				(U1)		
b	b			**1m**	Indicates 1000, ie 1 10 100 (1000) 10 000	

Tier & Question					Range of ages	
3-5	4-6	5-7	6-8			
12	5				**Correct response**	**Additional guidance**
a	a			**1m**	Gives two ages with a difference of 7 years eg ■ 1 and 8 ■ 7 and 14 ■ 7 and 0 ■ 20 and 13	! *Ages given using part-years* Accept provided the difference is 7 years eg, accept ◆ 6 months and $7\frac{1}{2}$
b	b			**1m**	0	! *Response given in words* Accept provided there is no ambiguity eg, accept ◆ Zero ◆ Nothing eg, do not accept ◆ No range ! *Units amended* Accept responses giving a short time interval eg, accept ◆ A few minutes ◆ A couple of hours

Tier & Question						
3-5	4-6	5-7	6-8		**Placing fractions**	
13	**6**				**Correct response**	**Additional guidance**
				2m	Gives all four fractions in the correct positions, ie  	✓ *Unambiguous indication of fractions* For $\frac{1}{3}$ as a decimal, accept 0.33 or better For $\frac{1}{8}$ as a decimal, accept 0.13 or better eg, for 2m accept ◆  ◆ 
				or **1m**	Gives at least two fractions in the correct positions or Converts at least three of the four correct values into a form enabling comparison, even if the positions are incorrect and there are other errors eg ■ At least three of: $\frac{90}{120}, \frac{15}{120}, \frac{40}{120}, \frac{72}{120}$ ■ At least three of: 0.75, 0.125, 0.33, 0.6 ■ $\frac{30}{40}, \frac{5}{40}, \frac{24}{40}$ ■ $\frac{18}{24}, \frac{3}{24}, \frac{8}{24}$ ■ $\frac{45}{60}, \frac{20}{60}, \frac{36}{60}$	

Tier & Question				Survey results		
3-5	4-6	5-7	6-8			
14	7				Correct response	Additional guidance
a	a			**1m**	Draws a correct bar for Don't know that indicates 9 people	! *Bar not ruled, accurate or shaded* Accept provided the pupil's intention is clear, and the height of the bar is closer to 9 than to either 8 or 10 ! *Bar incorrectly positioned or of an incorrect width* Condone
b	b			**1m** U1	Indicates 3 circles for Don't know	! *Circles not shaded or inaccurate in size* Accept provided the pupil's intention is clear ! *Follow through from part (a)* Accept the number of circles drawn as the height of their bar for Don't know ÷ 3 If this results in a part circle, condone any inaccuracy in their part circle

Tier & Question					Percentages	
3-5	4-6	5-7	6-8			
15	8	1			Correct response	Additional guidance
a	a	a		**1m**	7	! *For the first mark, 'out of 10' repeated* eg • $\frac{7}{10}$ Condone
				1m	50	
b	b	b		**1m**	Completes the sentence correctly with two values that are in the ratio 1 : 20 eg ■ 1 out of 20 ■ 5 out of 100 ■ 0.5 out of 10 ■ 10 out of 200 ■ 2.5 out of 50	
				1m U1	Completes the sentence correctly, in a different way from one previously credited	! *Follow through* Accept as two values in the same ratio as their two values for the first mark, provided their first value < their second value eg, from their first mark as 1 out of 5 accept • 2 out of 10

Tier & Question						
3-5	4-6	5-7	6-8		*Marking overlay available*	**Rotating**
16	9	2			**Correct response**	**Additional guidance**
				2m	Gives correct triangles for both grids with vertices within the tolerances as shown on the overlay, ie 	! *Lines not ruled or accurate* Accept provided the pupil's intention is clear
				or **1m**	Gives a correct triangle for either grid with vertices within the tolerances as shown on the overlay, even if the other is incorrect or omitted eg ▪  or Completes two rotations of 90° clockwise that do not use the given centre of rotation eg ▪  or Fails to complete the first rotation correctly but draws a shape that is a triangle, then follows through to rotate their triangle correctly through 90° clockwise about the given centre of rotation eg ▪ 	

Tier & Question						
3-5	4-6	5-7	6-8		**What is my number?**	
17	**10**	**3**			**Correct response**	**Additional guidance**
				2m	21	
				or		
				1m	Shows or implies that 2 × my number is 42 eg ■ 2 × my number = 357 − 315 = 42 ■ $2x = 42$ ■ 42 ÷ 2 or Shows a complete correct method with not more than one computational error, even if their choice between alternative answers is incorrect or omitted eg ■ 15 × 10 = 150, 150 + 150 + 15 = 315, so it's 10 + 10 + 1 ■ 357 − 170 − 170 − 17 − *17 (error)* = 0, so it's 10 + 10 + 1 + 1 = 22 ■ $15\overline{)315}$ *1 (error)* 1 ■ $15\overline{)315}$ 21 $17\overline{)357}$ *5 (error)* 1
				(U1)		

Tier & Question						
3-5	4-6	5-7	6-8		**Completing**	
18	**11**	**4**			**Correct response**	**Additional guidance**
				1m	32	! *For the first and second marks, incomplete processing* Penalise only the first occurrence eg, for the first and second marks ◆ 4 × 8 48 ÷ 4 Mark as 0, 1
				1m	12	
				1m	Gives a correct expression in x with a value of 48 when x is 8 eg ■ $6x$ ■ $x + 40$ ■ $3x + 24$	! *For the third mark, unconventional notation* Condone eg, for the third mark accept ◆ $6 \times x$ ◆ $x6$

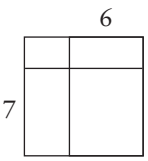
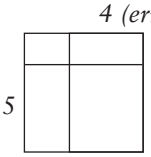
Tier & Question					Mean and median	
3-5	4-6	5-7	6-8			
19	12	5			**Correct response**	**Additional guidance**
a	a	a		**1m**	Shows that the mean is 10 eg ■ 9 + 11 + 10 = 30, 30 ÷ 3 ■ (9 + 11 + 10) ÷ 3 ■ 10 is already 10, then 9 is 1 below and 11 is 1 above	✓ *Minimally acceptable explanation* eg ◆ 30 ÷ 3 ◆ 30 ÷ 10 = 3 ◆ 9 + 11 = 20, 20 ÷ 2 ◆ Add one to 9 and take one off 11 ◆ 10 is halfway between 9 and 11 ✓ *Method described* eg ◆ You add them up then divide by how many there are × *Incorrect statement* eg ◆ 9 + 10 + 11 ÷ 3 = 10 ◆ 3 ÷ 30 = 10
				1m	Gives a correct explanation of why the median is 10 eg ■ 10 is the middle number when the numbers are in order ■ The median is the middle number when the numbers go from smallest to largest	✓ *Minimally acceptable explanation* eg ◆ It is the middle number ◆ It's the middle largest ◆ It's the second smallest ◆ 9 (10) 11 ◆ It is in between × *Incomplete or incorrect explanation* eg ◆ 9 10 11 ◆ 10 is halfway between 9 and 11
b	b	b		**1m** (U1)	Gives four values that total 40 and whose middle two numbers, when ordered, add to 20, with none of the values being 10 eg ■ 8 9 11 12 ■ 0 0 20 20 ■ 9 11 9 11 ■ 7 13 9 11	✓ *Fractions, decimals and negatives*

Tier & Question						
3-5	4-6	5-7	6-8			**Angles**
20	13	6			**Correct response**	**Additional guidance**
				1m	Shows angle *a* as 50	
				1m	Shows angle *b* as 130	! ***For the second mark, follow through*** Accept follow through as 180 − their *a*, provided their *a* < 90 and is not 54 to 56 inclusive
				1m	Shows angle *c* as 20	! ***For the third mark, follow through*** Accept follow through as 150 − their *b* or their *a* − 30, provided this gives a positive value

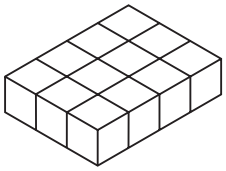
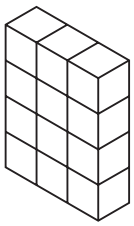
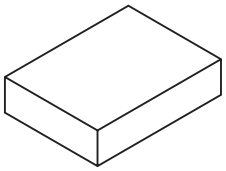
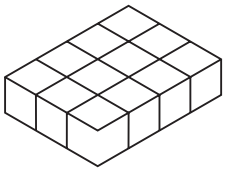
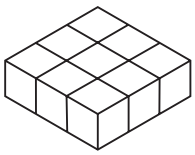
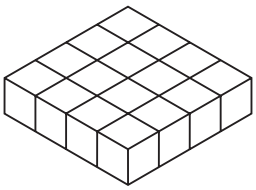
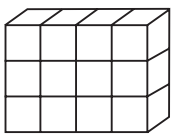
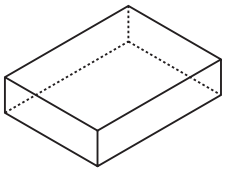
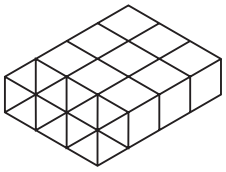
Tier & Question						
3-5	4-6	5-7	6-8			**Equations**
21	14	7			**Correct response**	**Additional guidance**
				1m	*5*	! ***Incorrect notation*** eg, for the first mark ◆ ×5 Penalise only the first occurrence
				1m	3	! ***Incomplete processing*** eg, for the first mark ◆ $\frac{15}{3}$ Penalise only the first occurrence

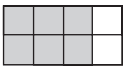
Tier & Question						
3-5	4-6	5-7	6-8		**Long multiplication**	
22	**15**	**8**			**Correct response**	**Additional guidance**
				2m	8602	
				or		
				1m	Shows a complete correct method with not more than one computational error eg ■ 3740 + 3740 + 374 × 3 = 7480 + 1122 ■ 300 70 4 20 | 6000 1400 80 3 | 900 210 12 so 6000 + 1400 + 80 + 900 + 210 + 12 ■ 374 23 *1126 (error)* 7480 8606	✗ *Conceptual error* eg • 374 23 1122 748 1870

Tier & Question						
3-5	4-6	5-7	6-8		**Midpoint**	
23	**16**	**9**	**1**		**Correct response**	**Additional guidance**
	a	a	a	**1m**	(60, 60)	
	b	b	b	**1m**	Gives M as (0, 100)	
				1m	Gives N as (60, 0)	! *Answers for M and N transposed but otherwise completely correct* If this is the only error, ie gives M as (60, 0) and gives N as (0, 100), mark as 0, 1 ! *x- and y-coordinates transposed but otherwise correct for both M and N* If this is the only error, ie gives M as (100, 0) and gives N as (0, 60), mark as 0, 1
				(U1)		

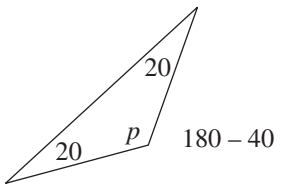
Tier & Question					Square cut	
3-5	4-6	5-7	6-8			
	17	10	2		Correct response	Additional guidance
				2m	42, with no evidence of an incorrect method	✗ *Incorrect method* eg • 12 + 2 = 14, 14 × 3 = 42
				or **1m**	Shows or implies that the square is a 9(cm) by 9(cm) square eg ■ 7 × 6 seen ■  ■ Area of square = 81 or Shows or implies a correct method in which the only error is to use an incorrect value for the shorter horizontal side of rectangle A eg ■ 12 ÷ 2 = *8 (error)*, 8 + 3 = 11 11 − 2 = 9, 8 × 9 = 72 ■  Answer: 20	
				U1		

Tier & Question					Making zero	
3-5	4-6	5-7	6-8			
	18	**11**	**3**		**Correct response**	**Additional guidance**
	a	a	a	**1m**	Indicates only the second statement, ie ☐ ✓ ☐ ☐	
	b	b	b	**1m**	Indicates that the other number is zero eg ■ 0 ■ Zero	✓ *Minimally acceptable indication* eg ◆ 0 + 0 ◆ Same ! *Use of negative sign* eg ◆ –0 Condone
				1m U1	Gives a correct pair of non-zero values that add to make zero eg ■ 1 and –1 ■ –45 and +45 ■ x and $-x$	× *Operation changed* eg ◆ 1 – 1 ['and' crossed out]

Tier & Question						**Cuboid**
3-5	4-6	5-7	6-8			
	19	12	4		**Correct response**	**Additional guidance**
				2m	Draws a 1 by 3 by 4 cuboid in any orientation, using the isometric grid eg ▪  ▪ 	✓ *Some or all internal lines omitted* eg ◆  ! *Lines not ruled* Accept provided the pupil's intention is clear ! *Drawing not accurate* For 2m, accept vertices within 2mm of the dots of the grid For 1m, accept a less accurate drawing provided the pupil's intention is clear
				or **1m**	Draws a correct view, using the isometric grid and maintaining three dimensions, but either omits one or more external lines or shows some hidden lines eg ▪  or Draws a view of a cuboid, using the isometric grid and with all external lines and no hidden lines shown, but with only one dimension incorrect, by not more than one unit eg ▪  ▪  or Shows a 1 by 3 by 4 cuboid in any orientation, but does not use the isometric grid correctly eg ▪ 	! *Cuboid enlarged* For 2m or 1m, accept provided a consistent scale factor has been used for all lengths, and any internal lines divide the cuboid into only 12 smaller cubes ! *For 2m, hidden lines shown* Do not accept unless the lines are clearly identified as hidden lines eg, for 2m, accept ◆  eg, for 2m, do not accept ◆  × *For 2m, external lines omitted*

Tier & Question						
3-5	4-6	5-7	6-8		# Dividing fractions	
	20	**13**	**5**		**Correct response**	**Additional guidance**
				3m	Gives the first value as 2 and the second value as 6	✓ *For the second value* $\frac{6}{1}$! *Eighths repeated* Accept as the final answer for the first value eg, for the value 2 accept • $\frac{2}{8}$ Do not accept as the final answer for the second value eg, for the value 6 do not accept • $\frac{6}{8}$
				or **2m**	Gives an incorrect or omitted first value but correctly gives the second value as 6 or Gives an incorrect first value but follows through correctly for the second value as their first value × 3, provided their first value is a positive integer eg ■ first value: 4 second value: 12 or Gives the correct first value and shows or implies a correct method for the second value with not more than one computational error eg ■ 2 × 3 ■ 3 ÷ 0.5 ■ $\frac{3}{4} \times \frac{8}{1}$ ■ $\frac{24}{4}$ ■ $\frac{6}{8} \div \frac{1}{8}$ ■ Answer of $\frac{6}{8}$ or equivalent, with no evidence of an incorrect method ■ 	× *For 2m or 1m, conceptual error* eg • $\frac{6}{8} \div \frac{1}{8} = \frac{5}{8}$
				or **1m**	Gives an incorrect or omitted first value but shows or implies a correct method for the second value with not more than one computational error	! *For 1m, follow through* For 1m, accept follow through as the intention to multiply their first value by 3 shown or implied eg, accept • first value: $\frac{4}{8}$ second value: $1\frac{1}{2}$ or equivalent • first value: $\frac{4}{8}$ then $\frac{4}{8} \times 3$ seen

Tier & Question						
3-5	4-6	5-7	6-8	*Refer to the new algebra general guidance*	**Solving an equation**	
	21	**14**	**6**		**Correct response**	**Additional guidance**
				2m	$\frac{25}{4}$ or equivalent	× *For 2m,* $\frac{25}{4}$ *seen but with incorrect further working* eg • $\frac{25}{4} = 6.1$
				or **1m**	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 ■ $2t = 25 - 2t$ ■ $-25 + 2t = -2t$ ■ $2t + 2t = 100 - 75$ ■ $75 + 4t = 100$ ■ $4t = 25$ ■ $25 \div 4$ seen	! *Method used is trial and improvement* Note that no partial credit can be given

Tier & Question					
3-5	4-6	5-7	6-8	**Angle *p***	
	22	**15**	**7**	**Correct response**	**Additional guidance**
				2m 140	
				or **1m** Shows the value 110 or 220 or Shows or implies a complete correct method with not more than one computational error eg ■ $360 - 2 \times (180 - 35 \times 2)$ ■ $360 - (360 - 4 \times 35)$ ■ 70×2 ■  180 – 40 ■ $35 + 35 = 80$ *(error)*, $180 - 80 = 100$ $360 - 100 \times 2 = 160$	

Tier & Question					Speed bumps	
3-5	4-6	5-7	6-8			
	23	16	8		Correct response	Additional guidance
		a	a	**2m**	Completes both sentences correctly, with all four values in the correct positions, ie 46 12 35 3 *or* **1m** Gives at least two values in the correct positions or Shows the values 46, 12, 35 and 3, even if their positions are incorrect	! *Throughout the question, key not interpreted* eg, for the value 46 • 4|6 Penalise only the first occurrence
		b	b	**1m**	Gives a correct justification eg ■ 38 – 28 = 10 ■ It falls from 38 to 28	✓ *Minimally acceptable justification* eg • 38 and 28 identified, with no evidence of an incorrect method ! *Ambiguous notation* eg • 28 – 38 Condone × *Incomplete or incorrect justification* eg • The difference between the middle numbers before and after is 10 • Indicates both values of 8 corresponding to the units of 38 and 28 on the diagram, but with no interpretation of the key • Before the median was 39, after the median was 29, so it fell by 10

Tier & Question				*Refer to the new algebra general guidance*	**Straight line graph**	
3-5	4-6	5-7	6-8			
	24	**17**	**9**		**Correct response**	**Additional guidance**
	a	a	a	**1m**	Indicates that the y-coordinate is 146	✓ ***Indication is within a pair of correct coordinates*** eg, for part (a) ◆ (50, 146) eg, for part (b) ◆ (18, 50) ! ***Answers to parts (a) and (b) transposed but otherwise correct*** Mark as 0, 1
	b	b	b	**1m**	Indicates that the x-coordinate is 18	
		c	c	**1m**	Indicates Yes and gives a correct explanation with no evidence of incorrect working eg ■ When $x = -10$, $y = 3 \times -10 - 4$ $= -30 - 4$ $= -34$ ■ $3x - 4 = -34$ $3x = -30$ $x = -10$	✓ ***Minimally acceptable explanation*** eg ◆ $-30 - 4 = -34$ ◆ $-30 \div 3 = -10$ ◆ When $x = -10$, $3x - 4 = -34$ ◆ The second number is equal to the first number multiplied by 3, minus 4 ✗ ***Incomplete or incorrect explanation*** eg ◆ When $x = -10$, $y = -34$ ◆ $3x - 4 = -34$ $3x = -34 - 4$ $3x = -30$ $x = -10$

Tier & Question						64
3-5	4-6	5-7	6-8			
		18	10		Correct response	Additional guidance
				3m	Gives four different correct pairs of values for x and y eg ■ $x = 64$ $y = 1$ $x = 8$ $y = 2$ $x = 4$ $y = 3$ $x = 2$ $y = 6$ ■ $x = \frac{1}{64}$ $y = -1$ $x = 4096$ $y = \frac{1}{2}$ $x = \sqrt{8}$ $y = 4$ $x = -8$ $y = 2$	
				or **2m**	Gives three different correct pairs of values for x and y, even if there are errors, omissions or repeats	
				or **1m**	Gives two different correct pairs of values for x and y, even if there are errors, omissions or repeats	

Tier & Question						Sixths
3-5	4-6	5-7	6-8			
		19	11		Correct response	Additional guidance
				1m	Gives a correct justification The most common correct justifications:	! *Response contains an incorrect statement* Ignore alongside a correct response eg, accept • $\frac{1}{3}$ is 33 and 100 ÷ 6 = 16
					State or imply that $\frac{2}{6} = \frac{1}{3}$ and use the known fact that $\frac{1}{3}$ rounds to 33% eg ■ $\frac{2}{6} = \frac{1}{3}$ which is 33 to the nearest per cent	✓ *Minimally acceptable justification* eg • $\frac{1}{3}$ is 33 × *Incomplete justification* eg • It's 33% not 34%
					Show or imply that the percentage should be 33 by showing a more accurate percentage, or a correct method eg ■ It's $33\frac{1}{3}$% so it rounds to 33 not 34 ■ 100 ÷ 6 × 2 = 33.33, so 33 ■ Double 16.7 is 33.4 ■ 34 × 3 = 102, but 33 × 3 = 99 which is closer to 100	✓ *Minimally acceptable justification* eg • 33.3 • 100 ÷ 6 × 2 gives 33 • 34 × 3 = 102 but 33 × 3 = 99 ! *More accurate percentage rounded or truncated* For $\frac{1}{3}$, accept 33.3% or better For $\frac{1}{6}$, accept 16.7% or 16.66% or better × *Incomplete justification* eg • 100 ÷ 6 × 2 • 34 × 3 = 102 (or 33 × 3 = 99)
					Refer to the effect of the premature rounding, for example by giving a possible value for $\frac{1}{6}$ in the range 16.5 to 16.75 inclusive, or 17.25 to 17.5 inclusive, and shows or implies the percentage for $\frac{2}{6}$ could be 33 or 35 eg ■ If $\frac{1}{6}$ were 16.6%, it would be 17% to the nearest per cent, but double 16.6 is 33.2 ■ $\frac{1}{6}$ could be 17.4, but 17.4 × 2 = 34.8	✓ *Minimally acceptable justification* eg • 17% is rounded not exact, so when you double it, you double the error • 17 is not exact, so it could be 33 or 35 × *Incomplete justification* eg • $\frac{1}{6}$ rounds to 17, so $\frac{2}{6}$ could round to 33 • Keep adding 17 and you don't get to 100 • 17 × 6 = 102 × *Incorrect justification that implies hypothetical values are the correct values* eg • $\frac{1}{6}$ = 16.5% so $\frac{2}{6}$ = 33%

Tier & Question					Tyres	
3-5	4-6	5-7	6-8			
		20	12		Correct response	Additional guidance
		a	a	**1m**	5	
		b	b	**1m**	Gives a value between 3500 and 5500 inclusive	**!** ***Incorrect units inserted*** eg • 5000 miles Ignore

Tier & Question					*Refer to the new algebra general guidance*	**Which triangles?**
3-5	4-6	5-7	6-8			
		21	**13**		**Correct response**	**Additional guidance**
		a	a	**1m**	Indicates the correct triangle, ie ✓ ____ and gives a correct equation linking a, b and c for the other triangle eg ■ $a^2 + c^2 = b^2$ ■ $b^2 - a^2 = c^2$ ■ $b^2 - c^2 = a^2$ ■ $b = \sqrt{a^2 + c^2}$	
		b	b	**1m**	Indicates the correct triangle, ie ✓ ____ and gives a correct explanation for the other triangle The most common correct explanations: State or imply that the third angle in the triangle on the right is not 90° eg ■ 180 – 75 – 25 = 80 not 90, so you can't use Pythagoras' Theorem ■ Angle C is not 90, so it's not a right-angled triangle Show that if the third angle in the triangle on the right were 90°, the triangle would not be possible ■ If the missing angle is 90, the angles add up to 190 not 180	✓ *Minimally acceptable explanation* eg ◆ Not 90 ◆ Not a right angle ◆ It only works when it's right-angled × *Incomplete explanation that does not refer explicitly to 90°* eg ◆ 180 – 75 – 25 = 80 ◆ You can't use Pythagoras' Theorem ◆ The angles are wrong ✓ *Minimally acceptable explanation* eg ◆ If you put 90 in you don't get 180 ◆ A right-angled triangle is impossible with those angles, they should make 180 ◆ The angles add up to 190 [right angle marked on right hand triangle] ◆ They add up to 100 not 90 × *Incomplete explanation that does not refer explicitly to 90°* eg ◆ The angles would add up to 190, not 180

Tier & Question					Sweet peas	
3-5	4-6	5-7	6-8			
		22	14		Correct response	Additional guidance
		a	a	**1m**	$\frac{89}{100}$ or equivalent probability	! *Unconventional notation, but equivalent value* eg, for the first mark • $\frac{17.8}{20}$ Condone
				1m	$\frac{17}{20}$ or equivalent probability	! *Estimates transposed but otherwise correct* Mark as 0, 1
		b	b	**1m**	Indicates Ravi and gives a correct explanation that states or implies that he used more seeds eg ■ The more trials you have the more accurate your estimate of probability is likely to be ■ The number of seeds in each packet was the same but Ravi had more packets than Meg so he had a greater number of trials ■ There were more seeds to consider ■ 200 seeds is more than 100 seeds	✓ *Minimally acceptable explanation* eg • More seeds • More packets • He tested more • He had 200, not 100 • Ravi had 10, Meg had 5 ! *Irrelevant statement* eg • Ravi's results were more accurate • He had more chance of a bigger number germinating Ignore alongside a correct response, otherwise do not accept × *Incomplete, ambiguous or incorrect explanation* eg • More • A bigger number • Ravi's = $\frac{170}{200}$ which is more than $\frac{89}{100}$ • More of his seeds germinated • He had 5 more seeds • Meg's numbers were more complicated and harder to work out
				(U1)		

Tier & Question						
3-5	4-6	5-7	6-8		**How many digits?**	
		23	**15**		**Correct response**	**Additional guidance**
				2m	Gives a correct response that satisfies the following four conditions: 1. Indicates the minimum is 4 2. Shows a correct justification for the minimum eg, for condition 2 ▪ 100 × 10 = 1000 3. Indicates the maximum is 5 4. Shows a correct justification for the maximum eg, for condition 4 ▪ 999 × 99 = 98 901 ▪ 999 × 100 = 99 900, a 5-digit number and subtracting 999 does not change it from being a 5-digit number ▪ 99 000 is just over the biggest possible so this must have the same number of digits ▪ 100 × 1000 = 100 000, but this is the smallest possible 6-digit number, so 99 × 999 must have 5 digits	✓ *Minimally acceptable justification for the minimum [condition 2]* eg • 1000 • 100 × 10 (or 10 × 100) ✓ *Minimally acceptable justification for the maximum [condition 4]* eg • 98 901 • 999 × 99 = 8991 + 89910 • 99 900 – 999 • 99 000 – 99 • 99 900 (or 99 000) is just over • 100 000 • 1000 × 100 (or 100 × 1000) × *Incomplete or incorrect justification for the maximum [condition 4]* eg • 999 × 99 • 99 900 – 99 • 99 000 – 999
				or **1m**	Gives a response that satisfies at least condition 4, even if condition 3 is not satisfied or Gives a response that satisfies condition 1, satisfies condition 4 with not more than one computational error, then follows through correctly to give their maximum	× *Conceptual error* eg • 999 × 99 = 8991 + 8991 = 17982 • 99 × 999 = 99 900 – 99 = 99 801
				(U2)		

Tier & Question						
3-5	4-6	5-7	6-8	*Refer to the new algebra general guidance*	**Simultaneous**	
		24	**16**		**Correct response**	**Additional guidance**
				3m	Gives both $x = \frac{3}{2}$ or equivalent and $y = 5$ and shows a complete correct method for solving algebraically eg ■ $4x + 3y = 21$ $4x + 2y = 16$ so $y = 5$ $2x + 5 = 8$ so $x = 1\frac{1}{2}$ ■ $4x + 3y = 21$ $6x + 3y = 24$ so $2x = 3$ therefore $x = 1.5$ and $y = 5$ ■ $2x + y = 8$ $2x + 2y = 13$ so $y = 5$ and $x = \frac{3}{2}$ ■ $4x + 3(8 - 2x) = 21$ $24 - 2x = 21$ $x = 1.5$, so $y = 5$	✖ *Method used is trial and improvement*
				or **2m**	Shows a complete correct method for solving algebraically with not more than one error eg ■ $4x + 3y = 21$ $4x + 2y = 16$ so $y = 4$ *(error)* $2x + 4 = 8$ so $x = 2$ ■ $4x + 3(8 - 2x) = 21$ $4x + 24 - 2x$ *(error)* $= 21$ $2x = -3$ $x = -1.5$ and $y = 11$ (or 9)	! *Only error is to use the wrong operation, spuriously eliminating either x or y* eg ◆ $4x + 3y = 21$ $4x + 2y = 16$ $5y = 37$, so $y = 7.4$ $2x + 7.4 = 8$ so $x = 0.3$ Mark as 1, 1, 0
				or **1m**	Forms two correct equations that would allow elimination of either x or y eg ■ $4x + 3y = 21$ $4x + 2y = 16$ ■ $4x + 3y = 21$ $6x + 3y = 24$ or Attempts to solve by substitution and forms a correct equation in either x or y eg ■ $4x + 3(8 - 2x) = 21$ ■ $8 - 2x = \frac{21 - 4x}{3}$ ■ $8 - y = 10.5 - 1.5y$	! *For 1m, equations subtracted without the second equation restated* Accept eg, for 1m accept ◆ $2x + 2y = 13$ seen

Tier & Question				*Marking overlay available*	**Angle bisector**	
3-5	4-6	5-7	6-8			
		25	**17**		**Correct response**	**Additional guidance**
				2m	Completes a correct angle bisector that fulfils all four of the following conditions: 1. Ruled 2. Within the tolerance as shown on the overlay, even if their line were to be extended 3. At least 3cm in length from A through the acute angle BAC 4. Evidence of correct construction arcs that are centred on two points on lines AB and AC equidistant from A, are of equal radii and have one point of intersection	! *Use of construction arcs on the overlay* Note that these are to give a visual guide as to whether a correct pair of centres has been used, and do not indicate tolerance ! *Section of angle bisector extending from A through reflex angle BAC* Accept if needed as part of the 3cm required, provided the section is within the tolerance as shown by the dashed lines on the overlay. Otherwise, ignore ! *Extra arcs drawn* Ignore × *Spurious construction arcs* For 2m or 1m, do not accept arcs drawn without compasses, or arcs centred on points on the lines that are not equidistant from A
				or **1m**	Gives a response that fulfils condition 4, even if the angle bisector is incomplete, incorrect or omitted	

Tier & Question						
3-5	4-6	5-7	6-8		**Star shapes**	
			18		**Correct response**	**Additional guidance**
			a	**1m**	8	! *Units given* Condone responses of 8cm only
			b	**1m**	Gives a different pair of dimensions in the ratio 5 : 2 or 2 : 5 eg ■ 2 and 5 (either order) ■ 10 and 25 (either order) ■ 1 and 2.5 (either order) ■ 12 and 30 (either order)	✗ *Dimensions of either given diagram* Do not accept value 6 and 15 (either order) or 8 and 20 (either order)

Tier & Question						
3-5	4-6	5-7	6-8		**Straight lines**	
			19		**Correct response**	**Additional guidance**
			a	**1m**	Gives A as (0, −8)	
				1m	Gives B as (2, 0)	! *Answers for A and B transposed but otherwise completely correct* If this is the only error, ie gives A as (2, 0) and gives B as (0, −8), mark as 0, 1
			b	**1m**	Gives a correct equation for the straight line eg ■ $y = 2x$ ■ $y - 2x = 0$ ■ $x = \frac{y}{2}$	! *Unconventional notation* eg ◆ $y = 2 \times x$ ◆ $y = 2x + 0$ Condone

Tier & Question						Acorns
3-5	4-6	5-7	6-8			
			20		**Correct response**	**Additional guidance**
			a	**1m**	Gives a correct explanation The most common correct explanations:	! *Median line referred to as the 'middle' or 'centre'* Condone eg, accept • The lines in the middle are at 26 and 29 • The centre points of the boxes are 3mm apart
					Show or imply that the median for group A is 26, and for group B is 29 eg ■ Median A – median B = 29 – 26 = 3 ■ 26 + 3 = 29 and A is 26, B is 29	✓ *Minimally acceptable explanation* eg • 26, 29 • A is 29 – 3 • B is 26 + 3 × *Incomplete explanation* eg • 29 – 3 • 26 + 3
					Indicate, in words or on the diagram, the locations of the medians for A and B eg ■ The vertical lines on the shaded part of the box plots represent the medians and they are 3mm apart on the graph	✓ *Minimally acceptable explanation* eg • The lines in the shaded bit are 3 apart • The lines in the boxes are the medians • Arrows indicating both medians on the diagram × *Incomplete explanation* eg • The vertical lines are 3mm apart on the graph • The lines for the medians are 3mm apart on the graph ! *Throughout the question, incorrect units* Condone eg, for part (a) accept • The lines in the boxes are 3cm apart ! *Throughout the question, ambiguous notation* eg, for part (a) • 26 – 29 eg, for part (b) • 24 – 29 > 27 – 31 Condone

Tier & Question						Acorns (cont)	
3-5	4-6	5-7	6-8				
			20			**Correct response**	**Additional guidance**
			b	**1m**	Indicates A and gives a correct explanation The most common correct explanations:	! *Inter-quartile range referred to as 'range'* Condone eg, accept • Range for A = 5, range for B = 4 • The boxes show the range and A's is longer
					Show or imply that the inter-quartile range for A is 5 and for B is 4 eg ■ For A the IQ range is 29 – 24 = 5, for B the IQ range is 31 – 27 = 4 ■ The distance between 24 and 29 is greater than that between 27 and 31 ■ The IQR is 1mm bigger for group A	✓ *Minimally acceptable explanation* eg • 5, 4 • 29 – 24 > 31 – 27 • 1 more × *Incomplete or incorrect explanation* eg • 5 is the larger inter-quartile range • 31 – 27 is less • The inter-quartile range for A is 4cm and for B is 3.2cm [scale ignored]
					Indicates, in words or on the diagram, the sizes of the inter-quartile ranges for A and B eg ■ The shaded box in A is longer than in B, so A has a bigger inter-quartile range ■ The box for group A covers 6 whole numbers, but for B only 5	✓ *Minimally acceptable explanation* eg • The box is bigger • Distances between lower and upper quartiles for both A and B indicated • It covers 6 numbers, the other covers 5
			c	**1m**	Gives a correct reason The most common correct reasons:	
					Refer to possible differences in the conditions of the two samples eg ■ The two groups could have collected the samples at different times of year ■ Group A could have picked from one side of the tree and group B from the other side ■ One group could have picked from the tree, the other from the ground ■ Group B may have collected first and taken most of the larger ones	✓ *Minimally acceptable reason* eg • Different times • Different areas of the tree • B's acorns may have had more sunlight × *Incomplete or incorrect reason* eg • Different areas • They used different trees
					Refer to possible differences in the sizes of the two samples eg ■ One group could have collected a much larger number of acorns than the other ■ One sample may be less representative as they didn't collect enough	✓ *Minimally acceptable reason* eg • Different numbers of acorns • You don't know how many acorns × *Incomplete reason* eg • You don't know how many • One group could have spent longer • There could have been more people to collect acorns in one of the groups
				(U1)			

Tier & Question					Standard form	
3-5	4-6	5-7	6-8			
			21		**Correct response**	**Additional guidance**
			a	**1m**	Gives a correct justification eg ■ $(4 \times 10^8) \times (8 \times 10^4) = (4 \times 8) \times (10^8 \times 10^4)$ $= 32 \times 10^{12}$ $= 3.2 \times 10^{13}$ ■ $4 \times 8 = 32$, $8 + 4 = 12$, so you get $32 \times 10^{12} = 3.2 \times 10^{13}$ ■ $400\,000\,000 \times 80\,000 = 32\,000\,000\,000\,000$ $= 3.2 \times 10^{13}$	✓ *Minimally acceptable justification* eg ◆ 32×10^{12} ◆ $4 \times 8 \times 10^{12}$ ◆ $400\,000\,000 \times 80\,000$ $= 32\,000\,000\,000\,000$ [12 zeros shown] × *Incomplete justification* eg ◆ $32\,000\,000\,000\,000 = 3.2 \times 10^{13}$ ◆ $400\,000\,000 \times 80\,000 = 3.2 \times 10^{13}$ ◆ $(4 \times 8) \times (10^8 \times 10^4) = 3.2 \times 10^{13}$
			b	**2m** *or* **1m**	5×10^3 Shows a value equivalent to 5×10^3 eg ■ 5000 ■ 0.5×10^4 ■ $\frac{10^4}{2}$ or Shows or implies a correct method that demonstrates understanding of how to process the indices and places the multiplication symbol correctly, with not more than one error eg ■ $4 \div 8 \times 10^{(8-4)}$ ■ $4 \times 10^8 \div 8 \times 10^4 = 2$ *(error)* $\times 10^4$	! *Zero(s) given after the decimal point within standard form notation* Condone eg, for 2m accept ◆ 5.000×10^3

Tier & Question						
3-5	4-6	5-7	6-8		**Data sets**	
			22		**Correct response**	**Additional guidance**
				2m	Gives both correct values, ie median = 90 mean = 97	! *Incomplete processing* Condone eg, for 2m accept • median = 90 mean = 95 + 2
				or **1m**	Gives one correct value or Shows the value 9700	
				U1		

Tier & Question						
3-5	4-6	5-7	6-8		*Marking overlay available* **Drawing a rhombus**	
			23		**Correct response**	**Additional guidance**
				2m	Draws a correct rhombus that fulfils all three of the following conditions: 1. Ruled 2. Correct intersecting construction arcs for at least one vertex, using compasses at either 8cm and 10cm or 8cm and 8cm, within the tolerances as shown on the overlay 3. Vertices within the tolerances as shown on the overlay	! *Different orientations* Markers should rotate and/or turn over the overlay as appropriate in order to check tolerances for construction arcs and/or vertices ! *Arcs extended or extra arcs* Ignore inaccuracies in sections of arcs extending beyond the tolerances as shown on the overlay, or arcs not indicated on the overlay, even if incorrect
				or **1m**	Gives a response that fulfils either condition 2 or condition 3	! *Spurious arcs* Do not accept as correct arcs drawn without compasses

Tier & Question					*Refer to the new algebra general guidance*	***a* and *b***
3-5	4-6	5-7	6-8			
			24		**Correct response**	**Additional guidance**
				3m	Gives a correct justification eg ■ $b + b + 2 = b(b + 2)$ $2b + 2 = b^2 + 2b$ $2 = b^2$ $b = \sqrt{2}$ which is not an integer, so a cannot be an integer either ■ $2a - 2 = a^2 - 2a$ $a^2 - 4a + 2 = 0$ which doesn't factorise, so a is not an integer	✓ *Minimally acceptable justification* eg ◆ $2b + 2 = b^2 + 2b$ $2 = b^2$! *Variables **a** and **b** transposed but justification otherwise completely correct* eg ◆ $a + a + 2 = a(a + 2)$ $2a + 2 = a^2 + 2a$ $2 = a^2$ $a = \sqrt{2}$ Mark as 1, 1, 0
				or **2m**	Shows correct expressions for the sum and product of a and b using only one of the two variables eg ■ $b + b + 2$, $b(b + 2)$ ■ $2a - 2$, $a^2 - 2a$	! *Numerical examples given* Ignore
				or **1m**	Shows or implies the use of expressions for a and b involving only one of the two variables eg ■ b, $b + 2$ ■ a, $a - 2$ ■ $2b + 2$ ■ $a^2 - 2a$ or Shows a different correct equation involving both the variables a and b eg ■ $a + b = ab$	
				(U3)		

Tier & Question					*Refer to the new algebra general guidance*	**Temperature**
3-5	4-6	5-7	6-8			
			25		**Correct response**	**Additional guidance**
				2m	Gives the value 10 and shows or implies a correct method for solving algebraically eg ■ $\frac{9C}{5} + 32 = 2C + 30$ $\frac{9C}{5} = 2C - 2$ $9C = 10C - 10$ $10 = C$ ■ $2C - \frac{9C}{5} = 32 - 30$ $\frac{10C - 9C}{5} = 2$ $\frac{C}{5} = 2$	✗ *Method used is trial and improvement*
				or **1m**	Shows or implies a correct first step of algebraic manipulation using a correct equation in terms of C, that either reduces the number of terms or collects unknowns on one side of the equation and numbers on the other eg ■ $\frac{9C}{5} + 2 = 2C$ ■ $0.2C + 30 = 32$ ■ $2C - \frac{9C}{5} = 32 - 30$ ■ $\frac{C}{5} = 2$ ■ 2×5	

Index to mark schemes

Tier				Question	Page
3–5	4–6	5–7	6–8		
1				Average heights	12
2				Making 24	12
3				Write a number	13
4				3-D shapes	13
5				Digits	14
6				Different shapes	15
7				Food and drink	16
8	1			Number lines	16
9	2			Shapes	17
10	3			Computation	17
11	4			Scales	18
12	5			Range of ages	19
13	6			Placing fractions	20
14	7			Survey results	21
15	8	1		Percentages	22
16	9	2		Rotating	23
17	10	3		What is my number?	24
18	11	4		Completing	24
19	12	5		Mean and median	25
20	13	6		Angles	26
21	14	7		Equations	26
22	15	8		Long multiplication	27
23	16	9	1	Midpoint	27
	17	10	2	Square cut	28
	18	11	3	Making zero	29
	19	12	4	Cuboid	30
	20	13	5	Dividing fractions	31
	21	14	6	Solving an equation	32
	22	15	7	Angle *p*	32
	23	16	8	Speed bumps	33
	24	17	9	Straight line graph	34
		18	10	64	35
		19	11	Sixths	36
		20	12	Tyres	37
		21	13	Which triangles?	38

Tier				Question	Page
3–5	4–6	5–7	6–8		
		22	14	Sweet peas	39
		23	15	How many digits?	40
		24	16	Simultaneous	41
		25	17	Angle bisector	42
			18	Star shapes	43
			19	Straight lines	43
			20	Acorns	44
			21	Standard form	46
			22	Data sets	47
			23	Drawing a rhombus	47
			24	*a* and *b*	48
			25	Temperature	49