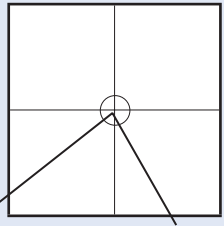
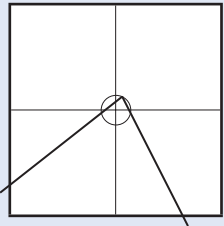
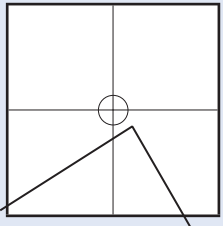


What if...	Marking procedure	
<i>The pupil's response is numerically or algebraically equivalent to the answer in the mark scheme.</i>	Markers should award the mark unless the mark scheme states otherwise.	
<i>The pupil's response does not match closely any of the examples given.</i>	Markers should use their judgement in deciding whether the response corresponds with the statement of the requirements given in the 'Correct response' column. Refer also to the 'Additional guidance'.	
<i>The pupil has responded in a non-standard way.</i>	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, should be accepted. Provided there is no ambiguity, condone the continental practice of using a comma for a decimal point.	
<i>There appears to be a misreading affecting the working.</i>	This is when the pupil misreads the information given in the question and uses different information without altering the original intention or difficulty level of the question. For each misread that occurs, deduct one mark only.	
<i>No answer is given in the expected place, but the correct answer is given elsewhere.</i>	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.	
<i>The final answer is wrong, but the correct answer is shown in the working.</i>	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:	
	<ul style="list-style-type: none"> the incorrect answer is due to a transcription error 	If so, award the mark.
	<ul style="list-style-type: none"> in questions not testing accuracy, the correct answer has been given but then rounded or truncated 	If so, award the mark.
	<ul style="list-style-type: none"> the pupil has continued to give redundant extra working which does not contradict work already done 	If so, award the mark.
<ul style="list-style-type: none"> 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.	
<i>The pupil's answer is correct but the wrong working is shown.</i>	A correct response should always be marked as correct unless the mark scheme states otherwise.	

What if...	Marking procedure
<p>The pupil has made a conceptual error.</p>	<p>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:</p> <ul style="list-style-type: none"> • 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.
<p>The correct response has been crossed or rubbed out and not replaced.</p>	<p>Any legible crossed or rubbed out work that has not been replaced should be marked according to the mark scheme. If the work is replaced, then crossed or rubbed out work should not be considered.</p>
<p>More than one answer is given.</p>	<p>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.</p>
<p>The pupil's answer correctly follows through from earlier incorrect work.</p>	<p>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.</p>
<p>The answer is correct but, in a later part of the question, the pupil has contradicted this response.</p>	<p>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.</p>
<p>The pupil's accuracy is marginal according to the overlay provided.</p>	<p>Overlays can never be 100% accurate. However, provided the answer is within or touches the boundaries given, the mark(s) should be awarded.</p>
<p>The pupil has drawn lines which do not meet at the correct point.</p>	<p>Markers should interpret the phrase 'lines not accurate' to mean meeting within or on a circle of radius 2mm with centre at the correct point.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>within the circle accepted</p> </div> <div style="text-align: center;">  <p>on the circle accepted</p> </div> <div style="text-align: center;">  <p>outside the circle not accepted</p> </div> </div>

Responses involving money

	✓ Accept	✗ Do not accept
<p>Where the £ sign is given</p> <p>for example: £3.20, £7</p>	<p>✓ £3.20 £7 £7.00</p> <p>Any unambiguous indication of the correct amount, eg £3.20p £3 20 pence £3 20 £3,20 £3-20 £3:20 320p with £ sign crossed out</p>	<p>✗ Incorrect placement of pounds or pence, eg £320 £320p</p> <p>Incorrect placement of decimal point, or incorrect use or omission of 0, eg £3.2 £3 200 £32 0 £3-2-0</p>
<p>Where the p sign is given</p> <p>for example: 40p</p>	<p>✓ 40p</p> <p>Any unambiguous indication of the correct amount, eg £0.40p £.40p £0.40 with p sign crossed out</p>	<p>✗ Incorrect or ambiguous use of pounds or pence, eg 0.40p £40p</p>
<p>Where no sign is given</p> <p>for example: £3.20, 40p</p>	<p>✓ £3.20 320p 40p £0.40</p> <p>Any unambiguous indication of the correct amount in £ or p as shown above</p> <p>At levels 3 and 4 only also accept omission of units, eg 3.20 320 40 0.40</p>	<p>✗ Omission of final zero, eg 3.2 0.4</p>

Responses involving negative numbers

	✓ Accept	✗ Do not accept
<p>For example: -2</p>		<p>To avoid penalising the error below more than once within each question, do not award the mark for the <i>first</i> occurrence of the error within each question. Where a question part carries more than one mark, only the final mark should be withheld.</p> <p>✗ Incorrect notation, eg 2-</p>

Responses involving time

	✓ Accept	✗ Do not accept
A time interval for example: 2 hours 30 minutes	✓ 2 hours 30 minutes Any unambiguous, correct indication, eg 2½ hours 2.5 hours 2h 30 2h 30 min 2 30 Digital electronic time, ie 2:30	✗ Incorrect or ambiguous time interval, eg 2.3 hours 2.3h 2h 3 2.30 min 2.30 2-30 2,30 2.3
A specific time for example: 8:40am, 17:20	✓ 8:40am 8:40 twenty to nine Any unambiguous, correct indication, eg 08.40 8.40 0840 8 40 8-40 8,40 Unambiguous change to 12 or 24 hour clock, eg 17:20 as 5:20pm or 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 8.4 084 84

Responses involving measures

	✓ Accept	✗ Do not accept
Where units are given (eg kg, m, l) for example: 8.6kg	✓ 8.6kg Any unambiguous indication of the correct measurement, eg 8.60kg 8.6000kg 8kg 600g	✗ Incorrect or ambiguous use of units, eg 8600kg

Note

If a pupil leaves the answer box empty but writes the answer elsewhere on the page, then that answer must be consistent with the units given in the answer box and the conditions listed above.

If a pupil changes the unit given in the answer box, then their answer must be equivalent to the correct answer, using the unit they have chosen, unless otherwise indicated in the mark scheme.

Responses involving coordinates

	✓ Accept	✗ Do not accept
<p>For example: (5, 7)</p>	<p>✓ Unconventional notation, eg (05, 07) (five, seven)</p> <p>$\begin{matrix} x & y \\ (5, & 7) \end{matrix}$</p> <p>$(x=5, y=7)$</p>	<p>✗ Incorrect or ambiguous notation, eg (7, 5)</p> <p>$\begin{matrix} y & x \\ (7, & 5) \end{matrix}$</p> <p>$(5x, 7y)$</p> <p>$(5^x, 7^y)$</p> <p>$(x-5, y-7)$</p>

Responses involving probability

	✓ Accept	! Take care ✗ Do not accept
<p>A numerical probability should be expressed as a decimal, fraction or percentage only.</p> <p>for example:</p> <p>0.7 $\frac{7}{10}$ 70%</p>	<p>✓ Equivalent decimals, fractions and percentages, eg 0.700</p> <p>$\frac{70}{100}$</p> <p>$\frac{35}{50}$</p> <p>70.0%</p> <p>✓ A probability correctly expressed in one acceptable form which is then incorrectly converted, but is still less than 1 and greater than 0, eg</p> <p>$\frac{70}{100} = \frac{18}{25}$</p>	<p>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 <i>first</i> 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.</p> <p>! A probability that is incorrectly expressed, eg 7 in 10 7 over 10 7 out of 10 7 from 10</p> <p>! A probability expressed as a percentage without a percentage sign.</p> <p>! A fraction with other than integers in the numerator and/or denominator.</p> <p>! A probability expressed as a ratio, eg 7:10 7:3 7 to 10</p> <p>✗ A probability greater than 1 or less than 0</p>

Responses involving the use of algebra

	✓ Accept	! Take care ✗ Do not accept
<p>For example:</p> <p>$2 + n$</p> <p>$n + 2$</p> <p>$2n$</p> <p>$\frac{n}{2}$</p> <p>n^2</p>	<p>✓ Unambiguous use of a different case or variable, eg N used for n x used for n</p> <p>✓ Words used to precede or follow equations or expressions, eg $t = n + 2$ tiles or tiles = $t = n + 2$ for $t = n + 2$</p> <p>✓ Unambiguous letters used to indicate expressions, eg $t = n + 2$ for $n + 2$</p>	<p>! 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</p> <p>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.</p> <p>✗ Embedded values given when solving equations, eg in solving $3x + 2 = 32$, $3 \times 10 + 2 = 32$ for $x = 10$</p> <p>To avoid penalising the two types of error below more than once within each question, do not award the mark for the <i>first</i> occurrence of each type within each question. Where a question part carries more than one mark, only the final mark should be withheld.</p> <p>! Words or units used within equations or expressions, eg n tiles + 2 n cm + 2</p> <p>Do not accept on their own. Ignore if accompanying an acceptable response.</p> <p>✗ Ambiguous letters used to indicate expressions, eg $n = n + 2$ for $n + 2$</p>

Tier & Question				Mark	Correct response	Additional guidance	Finding <i>b</i>
3–5	4–6	5–7	6–8				
24	17	8					
				<p>2m or 1m</p> <p>2</p> <p>Shows or implies that $a = 5$ and shows the intention to substitute this value into the second equation eg</p> <ul style="list-style-type: none"> $5 + 7 = 10 + b$ $b = 12 - 10$ <p>or</p> <p>Shows a complete correct method with not more than one computational error eg</p> <ul style="list-style-type: none"> $b = 11 - 6 + 7 - 10$ $a = 11 - 6 = 6$ (error) $6 + 7 = 10 + b$ $b = 3$ 			
						<p>✘ Conceptual error eg</p> <ul style="list-style-type: none"> $a = 11 + 6 = 17$ 	

Tier & Question				Mark	Correct response	Additional guidance	Matching
3–5	4–6	5–7	6–8				
18	9	1					
				<p>1m</p> <p>Matches both instructions on the left to the equivalent instruction on the right, ie</p>		<p>✘ Instruction on the left matched to more than one instruction on the right</p>	

Tier & Question				Mark	Correct response	Additional guidance	Oak leaves
3–5	4–6	5–7	6–8				
19	10	2					
				1m	<p>Gives a correct reason from one of the five categories below that states or implies the problem, or suggests an improvement</p> <p>The most common correct reasons:</p> <p>Category 1: Refer to the number of leaves in the sample being too small eg, problem</p> <ul style="list-style-type: none"> • The sample is too small • Those 10 leaves might all be diseased <p>eg, improvement</p> <ul style="list-style-type: none"> • They should pick more than 10 <p>Category 2: Refer to the number of trees in the sample being too small eg, problem</p> <ul style="list-style-type: none"> • One oak tree might be different from others • May be something wrong with that tree <p>eg, improvement</p> <ul style="list-style-type: none"> • They should use more than one tree <p>Category 3: Refer to the conditions in which the tree is growing being too uniform eg, problem</p> <ul style="list-style-type: none"> • Different conditions may affect the leaves on other trees • The soil might be very bad in that area <p>eg, improvement</p> <ul style="list-style-type: none"> • They should choose trees in different areas <p>Category 4: Refer to the area of the tree from which the leaves are picked being too small eg, problem</p> <ul style="list-style-type: none"> • The leaves on higher branches might be different • Those branches may not get enough light <p>eg, improvement</p> <ul style="list-style-type: none"> • They need leaves from all over the tree <p>Category 5: Refer to the period for picking the sample being too short eg, problem</p> <ul style="list-style-type: none"> • The leaves may be different at different times of year • It may be winter <p>eg, improvement</p> <ul style="list-style-type: none"> • They should collect throughout the year 	<p>✓ Minimally acceptable reason eg, problem</p> <ul style="list-style-type: none"> • Too small • Only 10 • Not enough • Just one • Same growing conditions for the tree • Other branches might be different • Only the lowest branches <p>eg, improvement</p> <ul style="list-style-type: none"> • 100 is better • More than one • Need different areas • Use other branches • Collect at other times <p>! For the first or the second reason, more than one reason given within one response Do not accept a correct response accompanied by an incorrect response from the same category. Otherwise ignore irrelevant or incorrect further responses. If two correct reasons from different categories are given in one response space, both marks should be awarded eg</p> <ul style="list-style-type: none"> • They need more trees from more areas <p>Mark as 1, 1</p> <p>✗ Incomplete reason that repeats the information given with no further explanation eg</p> <ul style="list-style-type: none"> • They are taking 10 leaves • They are using one oak tree • They are taking them from one part of the tree 	
				1m	Gives a correct reason from a different category from one already credited		

U1

Tier & Question						Missing lengths
3–5	4–6	5–7	6–8	Mark	Correct response	
20	11	3				
				2m	Gives both correct lengths, ie $x = 10$ and $y = 3.9$ or equivalent	
				<i>or</i>		
				1m	Gives $y = 3.9$ or equivalent	
					or	
					Gives the two values transposed, ie $x = 3.9$ or equivalent and $y = 10$	
					or	
					Shows a complete correct method with not more than one computational error	
					eg	
					<ul style="list-style-type: none"> • $x = 10, 10 - 6.1 = 4.9$ (error) • $4 \times 6.1 = 24.4, 40 - 24.4 = 16.6$ (error) $16.6 \div 4 = 4.15, 4.15 + 6.1 = 10.25$ • $40 \div 4 = 20$ (error) $20 - 6.1 = 13.9$ 	

Tier & Question						Counters	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
21	12	4					
a	a	a		2m or 1m	<p>Gives the value 3, with no evidence of an incorrect method</p> <p>Shows or implies a correct equation for the bags and 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</p> <p>eg</p> <ul style="list-style-type: none"> $6y + 1 = 4y + 7$ $6y - 4y = 7 - 1$ $-2y + 7 = 1$ $6y - 6 = 4y$ $2y = 6$ 	<p>! Method used is trial and improvement Note that no partial credit can be given</p>	
b	b	b		2m or 1m	<p>5</p> <p>Gives an answer of 4.(...)</p> <p>or</p> <p>Shows or implies a correct inequality using the expressions for the bags</p> <p>eg</p> <ul style="list-style-type: none"> $4k > k + 12$ $3k > 12$ $k > 4$ 	<p>! Method used is trial and improvement Note that no partial credit can be given</p>	
				(U1)			

Tier & Question						Prize money	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
22	13	5					
				2m or 1m	<p>£ 490 000</p> <p>Shows the value 980 000</p> <p>or</p> <p>Shows a complete correct method with not more than one error</p> <p>eg</p> <ul style="list-style-type: none"> $1\ 000\ 000 - 20\ 000 = 98\ 000$ (error), $98\ 000 \div 2 = 49\ 000$ 	<p>✓ £ 490k</p> <p>✗ For 1m, one million taken to be 100 000 eg</p> <ul style="list-style-type: none"> $100\ 000 - 20\ 000 = 80\ 000$, $80\ 000 \div 2 = 40\ 000$ <p>✗ For 1m, computational error that simplifies the division eg</p> <ul style="list-style-type: none"> $1\ 000\ 000 - 20\ 000 = 800\ 000$, $800\ 000 \div 2 = 400\ 000$ 	

Tier & Question				Mark	Correct response	Additional guidance	Correlation
3–5	4–6	5–7	6–8				
23	14	6					
a	a	a	1m	<p>Indicates B and gives a correct explanation</p> <p>The most common correct explanations:</p> <p>Refer to the 'slope' or 'gradient' of the points eg</p> <ul style="list-style-type: none"> The points make a pattern that is sloping upwards from left to right The line of best fit would have a positive gradient <p>Describe the relationship between the two variables eg</p> <ul style="list-style-type: none"> As the value on the x-axis increases, so does the value on the y-axis 	<p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> It slopes upwards It goes up It's like this ✓ <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> It slopes the positive way <p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> As one amount gets bigger, so does the other It could be the higher the temperature, the more ice creams are sold <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> They both increase It goes from the left-hand corner It is slanted towards the right 		
b	b	b	1m	<p>Indicates A and gives a correct explanation</p> <p>The most common correct explanations:</p> <p>Refer to the points being closer to a line of best fit eg</p> <ul style="list-style-type: none"> The points are practically in a straight line, so the correlation is very strong If you drew the line of best fit, the points in A would all be close to it but many would be further away in B <p>Refer to the 'line' or sloping pattern being clearer to see eg</p> <ul style="list-style-type: none"> You can see the pattern of a very clear, almost straight line In B you can see a pattern sloping upward, but it's not as clear 	<p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> They are closer to one line In B they are less bunched together in a line <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> The points are closer together In B they are more spread out <p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> They are in a straight line The pattern sloping downwards is clear In B the line is less easy to see B's points are sloping upwards, but not as definitely as in A <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> The pattern is clearer They are in a line 		

Tier & Question						Shape rules	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
24	15	7		2m	Completes all three rules correctly, ie $H = \frac{N}{2} + 1$ $A = \frac{H}{2} \times 2$ $\underline{A} = 2N + 2$	<p>! <i>Throughout the question, unconventional notation</i> eg, for the first rule</p> <ul style="list-style-type: none"> • $1N + 1$ Condone	
				or 1m	Completes two rules correctly	<p>! <i>Throughout the question, words used instead of letters</i> eg, for the second rule</p> <ul style="list-style-type: none"> • $A = \underline{\text{Height}} \times 2$ Penalise only the first occurrence	
						<p>! <i>For the second rule, $N + 1$ used</i> Accept provided there is no ambiguity eg, accept</p> <ul style="list-style-type: none"> • $(N + 1) \times 2$ eg, do not accept	
						<ul style="list-style-type: none"> • $N + 1 \times 2$ <p>✓ <i>For the third rule, $2H$ used</i></p>	

Tier & Question						Fortieths	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
25	16	8		1m	0.775	<p>✗ <i>Equivalent fractions</i></p>	
				1m	0.575	<p>✓ <i>Follow-through as their value for the first mark – 0.2</i></p>	

Tier & Question						Expressions	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
26	17	9					
a	a	a		1m	<p>Indicates $2n$ must be even and gives a correct explanation eg</p> <ul style="list-style-type: none"> Any whole number multiplied by two gives a number in the two times table, so is even Odd $\times 2 =$ even, even $\times 2 =$ even $2 \times$ odd is odd + odd = even $2 \times$ even is even + even = even All multiples of 2 are even Halving an odd number does not give a whole number 	<p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> $\times 2$ gives even Doubling any number gives even All the numbers in the 2 times table are even <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> $2 \times 1 = 2$ which is even, and $2 \times 2 = 4$ which is also even Even \times even is even Even \times odd is even Because when you add two odd numbers together you always make an even Because 2 is even 	
				U1			
b	b	b		1m	<p>Indicates $3n$ could be odd or even and gives a correct explanation eg</p> <ul style="list-style-type: none"> $3 \times 1 = 3$ which is odd, but $3 \times 2 = 6$ which is even Odd $\times 3 =$ odd, even $\times 3 =$ even Multiples of 3 can be odd or even An even or odd number can have a factor of 3 	<p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> $3 \times 1 = 3, 3 \times 2 = 6$ If n is 5 you get odd, if n is 6, you get even $3 \times$ some numbers = odd, but $3 \times$ some numbers = even Because 3 goes into both odd and even numbers In the 3 times table there are odd and even numbers <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> $3n$ is sometimes odd and sometimes even Even \times odd gives even odd \times odd gives odd 3, 6, 9, 12, 15..... 	
				U1			

Tier & Question								Ratio															
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance																	
	27	18	10																				
	a	a		1m	8																		
	b	b		1m	Gives a correct number of black beads and white beads such that: the number of black beads is $(3n - 1)$ and the number of white beads is $(2n - 3)$, provided $n \geq 2$ eg <ul style="list-style-type: none"> • 5 black beads, 1 white bead • 8 black beads, 3 white beads • 11 black beads, 5 white beads 	Markers may find the following list of correct examples helpful:																	
						<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Black</th> <th>White</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>1</td> </tr> <tr> <td>8</td> <td>3</td> </tr> <tr> <td>11</td> <td>5</td> </tr> <tr> <td>14</td> <td>7</td> </tr> <tr> <td>17</td> <td>9</td> </tr> <tr> <td>20</td> <td>11</td> </tr> </tbody> </table>				Black	White	5	1	8	3	11	5	14	7	17	9	20	11
Black	White																						
5	1																						
8	3																						
11	5																						
14	7																						
17	9																						
20	11																						
					U1																		

Tier & Question								Powers	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance			
	28	19	11						
				1m	Gives a correct justification that the difference between 3^2 and 3^3 is 18 eg <ul style="list-style-type: none"> • $3^2 = 9$, $3^3 = 27$, and $27 - 9 = 18$ • $3^3 - 3^2 = 3^2(3 - 1)$ $= 9 \times 2$ $= 18$ 	<p>✓ Minimally acceptable justification eg</p> <ul style="list-style-type: none"> • $27 - 9$ • $9 + 18 = 27$ <p>✗ Incomplete or incorrect justification eg</p> <ul style="list-style-type: none"> • $3^2 = 9$, $3^3 = 27$ • $3^3 - 3^2 = 18$ • $9 - 27 = 18$ 			

Tier & Question				Mark	Correct response	Additional guidance	Sorting primes																															
3–5	4–6	5–7	6–8																																			
		20	12																																			
				1m	<p>Identifies a value, n, such that n is prime, and shows that $2n + 1$ is not prime to demonstrate that the statement is incorrect</p> <p>eg</p> <ul style="list-style-type: none"> 7 is a prime number, but $2 \times 7 + 1 = 15$, and 15 is not a prime number 13 is prime, but 27 is not 	<p>✓ Minimally acceptable response</p> <p>eg</p> <ul style="list-style-type: none"> 7, 15 $2 \times 13 + 1 = 27$ <p>✗ Incomplete or incorrect response</p> <p>eg</p> <ul style="list-style-type: none"> $2 \times n$ is even, even + 1 is odd and not all odd numbers are prime <p>! More than one example given</p> <p>Accept provided a counter example is clearly identified</p> <p>eg, accept</p> <ul style="list-style-type: none"> 11 gives 23 13 gives 27 so this one <p>eg, do not accept</p> <ul style="list-style-type: none"> 11 gives 23 13 gives 27 <p>Markers may find the following list of correct examples helpful ($n < 100$):</p> <table border="1"> <thead> <tr> <th>n</th> <th>$2n + 1$</th> </tr> </thead> <tbody> <tr><td>7</td><td>15</td></tr> <tr><td>13</td><td>27</td></tr> <tr><td>17</td><td>35</td></tr> <tr><td>19</td><td>39</td></tr> <tr><td>31</td><td>63</td></tr> <tr><td>37</td><td>75</td></tr> <tr><td>43</td><td>87</td></tr> <tr><td>47</td><td>95</td></tr> <tr><td>59</td><td>119</td></tr> <tr><td>61</td><td>123</td></tr> <tr><td>67</td><td>135</td></tr> <tr><td>71</td><td>143</td></tr> <tr><td>73</td><td>147</td></tr> <tr><td>79</td><td>159</td></tr> <tr><td>97</td><td>195</td></tr> </tbody> </table>	n	$2n + 1$	7	15	13	27	17	35	19	39	31	63	37	75	43	87	47	95	59	119	61	123	67	135	71	143	73	147	79	159	97	195
n	$2n + 1$																																					
7	15																																					
13	27																																					
17	35																																					
19	39																																					
31	63																																					
37	75																																					
43	87																																					
47	95																																					
59	119																																					
61	123																																					
67	135																																					
71	143																																					
73	147																																					
79	159																																					
97	195																																					

U1

Tier & Question				Mark	Correct response	Additional guidance	Score
3–5	4–6	5–7	6–8				
		21	13				
		a	a	2m or 1m	11 Shows the values 56 and 45 or Gives an answer of 9 [the points gained in round 5]		
		b	b	1m	Gives a response that states or implies that Derek gained the same number of points in each round eg <ul style="list-style-type: none"> • He got the same number of points in each round • To keep the gradient the same, an equal number needs to be added each time • For every round going across, the line must have gone up the graph in equal steps 	<p>✓ Minimally acceptable response</p> <p>eg</p> <ul style="list-style-type: none"> • Same • Equal • No change • The total increases by the same number in each round • He gained 10 points each round <p>✗ Incomplete or incorrect response</p> <p>eg</p> <ul style="list-style-type: none"> • He gets about the same number of points in each round • It increases by the same number in each round • His points were consistent • A steady increase • He gets maximum points each round • The line could be horizontal 	

U1

Tier & Question				Mark	Correct response	Additional guidance	Rhombus
3–5	4–6	5–7	6–8				
		22	14				
				2m or 1m	<p>24</p> <p>Shows a correct method with not more than one computational error</p> <p>The most common correct methods:</p> <p>Calculate the area of the rhombus as half the area of the rectangle eg</p> <ul style="list-style-type: none"> $\frac{1}{2}(6 \times 8)$ $48 \div 2$ <p>Work with 2 or 4 triangles eg</p> <ul style="list-style-type: none"> Area of one little triangle is half of 3×4, there are 4 little triangles so $\times 4$ $(6 \times 4) \div 2 = 14$ (error), $14 \times 2 = 28$ 8 triangles altogether, so one is $48 \div 8 = 7$ (error), 4 shaded so $4 \times 7 = 28$ Area of rectangle: $6 \times 8 = 48$, Area of white triangle: $\frac{1}{2} \times 3 \times 4 = 6$ $4 \times 6 = 18$ (error), answer 30 		
				1m	<p>Shows the correct unit for their area or method eg</p> <ul style="list-style-type: none"> 24cm^2 2400mm^2 	<p>x Conceptual error eg</p> <ul style="list-style-type: none"> Area of triangle given as base \times height <p>! Area incorrect or omitted, but units given If the mark(s) for the correct area have not been awarded, condone cm^2 seen for the third mark</p>	

Tier & Question						Sums and products	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
		23	15				
		a	a	1m	Gives a pair of values with a negative sum and a positive product, ie where a and b are both negative eg <ul style="list-style-type: none"> • -2 and -1 • -9 and -10 • -0.5 and $-\frac{2}{5}$ • -3 and -3 		
		b	b	1m	Gives a pair of values with a positive sum and a negative product, ie where a is positive, b is negative and $ a > b $ eg <ul style="list-style-type: none"> • 2 and -1 • -9 and 10 • 0.5 and $-\frac{2}{5}$ 		

Tier & Question						Mean	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
		24	16				
				2m or 1m	16 Shows the value 66 or Shows or implies a complete correct method with not more than one computational error eg <ul style="list-style-type: none"> • $6 \times 11 - 5 \times 10$ • $5 \times 10 = 50, 6 \times 11 = 65$ (error) so 15 	<p>! For 1m, method uses arbitrary values with a mean of 10 for the original five numbers Condone eg, for 1m accept</p> <ul style="list-style-type: none"> • $8 + 9 + 10 + 11 + 12 = 49$ (error) • $6 \times 11 - 49 = 17$ <p>✗ For 1m, error is in the number of values in the set after one is added eg</p> <ul style="list-style-type: none"> • $5 \times 11 = 55, 55 - 50 = 5$ 	
					<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">U1</div>		

Tier & Question						Simultaneous	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
		25	17				
				3m	<p>Gives both $x = 5$ and $y = \frac{5}{2}$ or equivalent and shows or implies a complete correct method for solving algebraically</p> <p>eg</p> <ul style="list-style-type: none"> • $2x = 10, x = 5$ and $y = \frac{5}{2}$ • $3x + 18y = 60$ $3x + 6y = 30$ $12y = 30$, so $y = 2.5$ and $x = 5$ • $30 - 3x = 20 - x$ $10 = 2x, x = 5$ and $y = 2.5$ • $3(20 - 6y) + 6y = 30$ $60 - 18y + 6y = 30$ $30 = 12y, y = 2.5$ and $x = 5$ <p>or</p>	x Method used is trial and improvement	
				2m	<p>Gives either $x = 5$ or $y = \frac{5}{2}$ or equivalent and shows or implies a correct method for solving algebraically for that variable</p> <p>eg</p> <ul style="list-style-type: none"> • $2x = 10, x = 5$ • $3x + 18y = 60$ $3x + 6y = 30$ $12y = 30$, so $y = 2.5$ • $30 - 3x = 20 - x$ $10 = 2x, x = 5$ • $3(20 - 6y) + 6y = 30$ $60 - 18y + 6y = 30$ $30 = 12y, y = 2.5$ 		
				1m	<p>Subtracts the two given equations to eliminate y, or forms two correct equations that would allow elimination of x</p> <p>eg</p> <ul style="list-style-type: none"> • $2x = 10$ • $3x + 18y = 60$ $3x + 6y = 30$ <p>or</p> <p>Attempts to solve by substitution and forms a correct equation in only one variable</p> <p>eg</p> <ul style="list-style-type: none"> • $3(20 - 6y) + 6y = 30$ • $x + 30 - 3x = 20$ 		

Tier & Question				Mark	Correct response	Additional guidance	Shape
3–5	4–6	5–7	6–8				
		26	18				
				2m or 1m	<p>200, with no evidence of an incorrect method</p> <p>Shows or implies that $a = 5$</p> <p>or</p> <p>Shows or implies that the area of one rectangle is 50</p> <p>or</p> <p>Shows a complete correct method with not more than one computational error eg</p> <ul style="list-style-type: none"> $16a = 80$, so $a = 6$ (error) $6 \times 12 = 72$, $72 \times 4 = 288$ 		<p>! Error made in coefficient of a Follow-through with this value provided $12 \leq \text{coefficient of } a \leq 20$ eg</p> <ul style="list-style-type: none"> $12a$ (error) = 80, so $a = 6.6$ $6.6 \times 13.2 \times 4 = 348$

Tier & Question				Mark	Correct response	Additional guidance	Circle shapes
3–5	4–6	5–7	6–8				
		27	19				
				1m	Gives the correct expression for area A, ie Area A = $y + 3w$		<p>! Throughout the question, unconventional notation or unsimplified expressions Condone eg, for Area A, accept</p> <ul style="list-style-type: none"> $y + 3 \times w$ $y + w + w + w$ <p>eg, for Area B, accept</p> <ul style="list-style-type: none"> $1y + 1w$ $y + 3w - 2w$
				1m	Gives the correct expression for area B, ie Area B = $y + w$		<p>! Answers for Area A and Area B transposed but otherwise correct Mark as 0, 1</p> <p>! Answers for Area A and Area B correct followed by incorrect further processing Mark as 0, 1</p>
					(U1)		

Tier & Question				Mark	Correct response	Additional guidance	False
3–5	4–6	5–7	6–8				
		28	20				
		a	2m	<p>Gives a correct explanation</p> <p>The most common correct explanations:</p> <p>Give a correct counter example eg</p> <ul style="list-style-type: none"> When $j = 2$ and $k = 3$, $(j + k)^2 = 25$, but $j^2 + k^2 = 13$ If j is 2 and k is 3, $(2 + 3)(2 + 3) \neq 2^2 + 3^2$ <p>Give the correct expansion of the expression eg</p> <ul style="list-style-type: none"> $(j + k)(j + k) = j^2 + 2jk + k^2$, not $j^2 + k^2$ It should be $j^2 + jk + jk + k^2$ $jk + jk$ has been missed out so it should be $j^2 + 2jk + k^2$ <p>Address the misconception eg</p> <ul style="list-style-type: none"> Both things in the first brackets should be multiplied by both things in the second brackets, but the pupil has done $j \times j$ and $k \times k$ 	<p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> When $j = 2$ and $k = 3$ you get 25 and 13 <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> When $j = 2$ and $k = 3$ you get different answers for each side, so it can't be right <p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> $j^2 + 2jk + k^2$ $j^2 + jk + jk + k^2$ $2jk$ is missing <p>! Correct expression equated to zero eg</p> <ul style="list-style-type: none"> $j^2 + 2jk + k^2 = 0$ <p>Condone</p> <p>✗ Incomplete or incorrect explanation eg</p> <ul style="list-style-type: none"> $(j + k)(j + k) \neq j^2 + k^2$ $(j + k)^2 = j^2 + jk + k^2$ <p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> The pupil hasn't multiplied the j by the k or the k by the j There should be a jk term It should have been like this: <div style="text-align: center;"> </div> <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> There should be 3 terms in the answer The jks should be added You have to multiply everything in the second brackets by everything in the first brackets The pupil hasn't multiplied the first set of brackets by the second set properly You don't square j and k, you square the answer of $(j + k)$ 		

Tier & Question				Mark	Correct response	Additional guidance	False (cont)
3–5	4–6	5–7	6–8				
		28	20				
				or 1m	Shows a complete correct method with not more than one computational error when substituting values eg <ul style="list-style-type: none"> If $j = 2$ and $k = 3$ $(j + k)^2 = (2 + 3)^2 = 20$ (error), $j^2 + k^2 = 4 + 9 = 13$ or Shows or implies the four correct terms resulting from multiplying out the brackets, even if there is incorrect further working eg <ul style="list-style-type: none"> j^2, jk, jk, k^2 $j \times j + j \times k + j \times k + k \times k$ 	<ul style="list-style-type: none"> x Conceptual error eg <ul style="list-style-type: none"> $3^2 = 6$ 	
			b	1m	Gives a correct counter example eg <ul style="list-style-type: none"> $j = 0$ $k = 0$ Either j or k is zero Both j and k are zero It doesn't work if k is nought 		
				U1			
				U1			

Tier & Question					Dice probability																																																																											
3-5	4-6	5-7	6-8	21																																																																												
Mark					Correct response	Additional guidance																																																																										
				<p>2m or 1m</p> <p>$\frac{3}{4}$ or equivalent probability</p> <p>Shows or implies the number of possible outcomes where the product is a multiple of 3</p> <p>eg</p> <ul style="list-style-type: none"> <table border="1"> <tr><td>×</td><td>3</td><td>4</td><td>5</td><td>6</td></tr> <tr><td>3</td><td><u>9</u></td><td><u>12</u></td><td><u>15</u></td><td><u>18</u></td></tr> <tr><td>4</td><td><u>12</u></td><td>16</td><td>20</td><td><u>24</u></td></tr> <tr><td>5</td><td><u>15</u></td><td>20</td><td>25</td><td><u>30</u></td></tr> <tr><td>6</td><td><u>18</u></td><td><u>24</u></td><td><u>30</u></td><td><u>36</u></td></tr> </table> <table border="1"> <tr><td></td><td>3</td><td>4</td><td>5</td><td>6</td></tr> <tr><td>3</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr> <tr><td>4</td><td>✓</td><td></td><td></td><td>✓</td></tr> <tr><td>5</td><td>✓</td><td></td><td></td><td>✓</td></tr> <tr><td>6</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr> </table> <p>$3 \times 3, 3 \times 4, 3 \times 5, 3 \times 6,$ $4 \times 3, 4 \times 6,$ $5 \times 3, 5 \times 6,$ $6 \times 3, 6 \times 4, 6 \times 5, 6 \times 6$</p> <p>or</p> <p>Shows a complete correct method but makes not more than two errors in identifying multiples of 3, then follows through to give their correct probability</p> <ul style="list-style-type: none"> <table border="1"> <tr><td>×</td><td>3</td><td>4</td><td>5</td><td>6</td></tr> <tr><td>3</td><td><u>9</u></td><td><u>12</u></td><td><u>15</u></td><td><u>18</u></td></tr> <tr><td>4</td><td><u>12</u></td><td>16</td><td>20</td><td><u>24</u></td></tr> <tr><td>5</td><td>15</td><td>20</td><td>25</td><td><u>30</u></td></tr> <tr><td>6</td><td><u>18</u></td><td><u>24</u></td><td><u>30</u></td><td><u>36</u></td></tr> </table> <p>so $\frac{11}{16}$</p>	×	3	4	5	6	3	<u>9</u>	<u>12</u>	<u>15</u>	<u>18</u>	4	<u>12</u>	16	20	<u>24</u>	5	<u>15</u>	20	25	<u>30</u>	6	<u>18</u>	<u>24</u>	<u>30</u>	<u>36</u>		3	4	5	6	3	✓	✓	✓	✓	4	✓			✓	5	✓			✓	6	✓	✓	✓	✓	×	3	4	5	6	3	<u>9</u>	<u>12</u>	<u>15</u>	<u>18</u>	4	<u>12</u>	16	20	<u>24</u>	5	15	20	25	<u>30</u>	6	<u>18</u>	<u>24</u>	<u>30</u>	<u>36</u>	
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U2

Tier & Question				22	Mark	Correct response	Additional guidance	Solving									
3–5	4–6	5–7	6–8														
						<p>2m Gives $y = 20$ and shows or implies a correct first step of algebraic manipulation that either removes the denominator or removes the brackets eg</p> <ul style="list-style-type: none"> • $5(3y - 4) = 14y$ • $5(3y - 4) = 2y \times 7$ • $\frac{15y - 20}{2y} = 7$ • $\frac{5 \times 3y - 5 \times 4}{2y} = 7$ • $15y - 20 = 14y$ • $y - 20 = 0$ <p>or</p> <p>1m Shows or implies a correct first step of algebraic manipulation that either removes the denominator or removes the brackets, even if there are other errors</p>											
						<p>2m Gives $x = 5$ and $x = -5$, in either order and shows or implies the correct expansion of $(x + 4)(x - 4)$ eg</p> <ul style="list-style-type: none"> • $x^2 + 4x - 4x - 16$ • <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td> <td style="text-align: center;">x</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">x^2</td> <td style="text-align: center;">$4x$</td> </tr> <tr> <td style="text-align: center;">-4</td> <td style="text-align: center;">$-4x$</td> <td style="text-align: center;">-16</td> </tr> </table> • $x^2 - 16$ • $x^2 = 25$ <p>or</p> <p>1m Shows or implies the correct expansion of $(x + 4)(x - 4)$, even if there are other errors</p>		x	4	x	x^2	$4x$	-4	$-4x$	-16		
	x	4															
x	x^2	$4x$															
-4	$-4x$	-16															

Tier & Question				Mark	Correct response	Additional guidance															
3–5	4–6	5–7	6–8																		
			23			Distance from school															
					Marking overlay available																
			a	2m	<p>Draws a correct graph within the tolerance as shown on the overlay that fulfils the following conditions:</p> <ol style="list-style-type: none"> All four points marked correctly, ie (2, 19), (3, 25), (4, 28) and (5, 29) All points joined with a series of straight lines 	<p>! For 2m or 1m, points joined with a curve Condone</p> <p>! Follow-through For 1m, accept the following values as follow-through:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Distance</th> <th>Cf</th> <th>f-t</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>19</td> <td>none</td> </tr> <tr> <td>3</td> <td>25</td> <td>6 + their 19</td> </tr> <tr> <td>4</td> <td>28</td> <td>3 + their 25</td> </tr> <tr> <td>5</td> <td>29</td> <td>1 + their 28</td> </tr> </tbody> </table>	Distance	Cf	f-t	2	19	none	3	25	6 + their 19	4	28	3 + their 25	5	29	1 + their 28
Distance	Cf	f-t																			
2	19	none																			
3	25	6 + their 19																			
4	28	3 + their 25																			
5	29	1 + their 28																			
				or	Shows or implies the values 19, 25, 28 and 29 eg																
				1m	<ul style="list-style-type: none"> Fulfils condition 1 only Marks the points (1.5, 19), (2.5, 25), (3.5, 28) and (4.5, 29) [ie uses midpoints of each range as x-coordinates] <p>or</p> <p>Marks and joins at least three points correctly</p> <p>or</p> <p>Makes an error in marking one of the points, but follows through correctly for later points, and joins all their points</p>																
					(U2)																
			b	1m	<p>Gives a value between 1.4 and 1.6 inclusive</p> <p>or</p> <p>Follows through from an incorrect total to give the correct median for their graph</p>	<p>✓ Equivalent fractions or decimals</p> <p>! Follow-through Follow-through can only be given for an increasing graph which reaches (5, y)</p>															

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
			24			Coordinates
					Marking overlay available	
				1m	Gives A as (0, -2)	<p>! Answers for A and B transposed but otherwise completely correct If this is the only error, ie gives A as (1, -1) and gives B as (0, -2), mark as 0, 1</p>
				1m	Gives B as (1, -1)	

Tier & Question						Similar triangles	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
			25				
				2m	3, with no evidence of accurate or scale drawing	✗ For 2m or 1m, evidence of accurate or scale drawing, with no other method	
				or			
				1m	Shows or implies the ratio 4 : 10 eg <ul style="list-style-type: none"> • 0.4 or equivalent seen • 2.5 or equivalent seen • $2 : 5 = ? : 7\frac{1}{2}$ • $7.5 \div 10 \times 4$ • 0.75×4 • $30 \div 10$ 		

Tier & Question						Regions	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
			26				
				a	1m Gives the four correct letters, ie A, B, G and H, in any order		
				b	1m Gives the four correct letters, ie B, C, D and E, in any order		
				c	1m Gives the four correct letters, ie A, B, E and F, in any order		

Tier & Question						Average speed	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
			27				
				2m	Gives a correct justification that the average speed is 20km per hour eg <ul style="list-style-type: none"> • 1km at 15km/h takes $60 \div 15 = 4$ minutes, 1km at 30km/h takes $60 \div 30 = 2$ minutes, 2km in 6 minutes = 20km in 60 minutes = 20km per hour • $\frac{1}{15} + \frac{1}{30} = \frac{3}{30}$ = $\frac{1}{10}$, 2km in $\frac{1}{10}$ hour = 20km in 1 hour 	✓ For 2m, minimally acceptable justification eg <ul style="list-style-type: none"> • $4 + 2 = 6$ mins for 2km • $\frac{1}{15} + \frac{1}{30} = \frac{1}{10}$ for 2km ✗ For 2m, incomplete justification eg <ul style="list-style-type: none"> • 1km at 15km per hour takes $60 \div 15 = 4$ mins, 1km at 30km per hour takes $60 \div 30 = 2$ mins • 6 mins for 2km, so it's 60 mins for 20km which is 20km per hour 	
				or			
				1m	Shows or implies that the journey time up the hill was 4 minutes or equivalent, and the journey time down the hill was 2 minutes or equivalent eg <ul style="list-style-type: none"> • 4, 2 seen • $\frac{1}{15}, \frac{1}{30}$ seen • $60 \div 15, 60 \div 30$ seen 	! For 1m, total of 6 minutes or equivalent seen As the total of 6 minutes can be calculated from the given 20km per hour, do not accept as implying 4 minutes and 2 minutes unless a correct method is also seen	

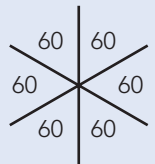
Tier & Question						Midpoints
3–5	4–6	5–7	6–8	Mark	Correct response	
19	10	1				
				1m	Gives P as (30, 35)	<p>! Answers for P and Q transposed but otherwise completely correct If this is the only error, ie gives P as (42, 0) and gives Q as (30, 35), mark as 0, 1</p> <p>! Follow-through for R as (their x coordinate of Q, their y coordinate of P) Allow follow-through provided their coordinates for P, Q and R are different</p>
				1m	Gives Q as (42, 0)	
				1m	Gives R as (42, 35)	
				U1		

Tier & Question						Rainfall	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
20	11	2					
				2m	Indicates place A and gives a correct justification eg • $10 \times 8 + 20 \times 4 = 160\text{cm}$ $5 \times 10 + 50 \times 2 = 150\text{cm}$ • $(80 + 80) \div 12 = 13.\dots\text{cm per month}$ $(50 + 100) \div 12 = 12.5\text{cm per month}$ • $(80 + 80) \div 2 = 80\text{cm per 6 months}$ $(50 + 100) \div 2 = 75\text{cm per 6 months}$	✓ For 2m, minimally acceptable justification eg • 160, 150 seen • 80, 80 and 50, 100 seen • $10 \times 8 + 20 \times 4 > 5 \times 10 + 50 \times 2$ • 13.(...), 12.5 seen	
				or 1m	Gives a correct justification, even if the decision is incorrect or omitted or Shows a complete correct method with not more than one computational error, and follows through to make their correct decision eg • $10 \times 8 + 20 \times 4 = 120$ (error) $5 \times 10 + 50 \times 2 = 150$, so place B		
				U1			

Tier & Question						Thinking distances	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
21	12	3					
	a	a	a	2m or 1m	315 Shows the value 245 or Shows a complete correct method, in which the 'squared' has been correctly interpreted, with not more than one computational error eg • $70 + \frac{70 \times 70}{20}$ • $70^2 = 4900, 4900 \div 20 = 2450$ (error), $70 + 2450 = 2520$		
	b	b	b	1m	50		

Tier & Question						Two shapes	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
22	13	4					
				2m or 1m	60 Shows the value 6 or Shows a complete correct method with not more than one computational error eg • $72 \div 12 = 8$ (error), $10 \times 8 = 80$		
				U1			

Tier & Question						Recycling	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
23	14	5					
				2m or 1m	760 000 Shows the value 1 240 000 or Shows a complete correct method with not more than one error eg • $2\,000\,000 \times 0.38$ • $38 \div 100 \times 2 \times 1\,000\,000$ • 2 million = 20 000 000 (error) $20\,000\,000 \times 0.38 = 7\,600\,000$		

Tier & Question						Shapes on a grid	
3–5	4–6	5–7	6–8	Mark	Correct response		
	24	15	6				
a	a	a		1m	<p>Gives a correct explanation</p> <p>The most common correct explanations:</p> <p>Refer to the sum of the angles in a triangle eg</p> <ul style="list-style-type: none"> The angles are equal and add up to 180, so $180 \div 3 = 60$ Angles in a triangle add up to 180, the three angles are equal so $60 + 60 + 60 = 180$ <p>Refer to the sum of angles at a point eg</p> <ul style="list-style-type: none"> You can see that six of the triangles fit together at a point, so $360 \div 6 = 60$ <div style="text-align: center;">  <p>Total: 360</p> </div>	<p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> $180 \div 3$ $60 \times 3 = 180$ The angles are the same and add up to 180 <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> The three angles add up to 180 Angles in a triangle add up to 180 The three angles are equal 60×3 It's an equilateral triangle <p>✓ Minimally acceptable explanation eg</p> <ul style="list-style-type: none"> $360 \div 6$ $60 \times 6 = 360$ <p>✗ Incomplete explanation eg</p> <ul style="list-style-type: none"> Six of the angles add up to 360 Angles at a point add up to 360 60×6 	
b	b	b		2m or 1m	<p>Gives all three correct angles, ie $a = 60, b = 120$ and $c = 240$</p> <p>Gives two correct angles</p>	<p>! For 1m, follow-through Provided their b is obtuse, accept c as $2 \times$ their b or $360 -$ their b</p>	
				(U1)			

Tier & Question				Mark	Correct response	Additional guidance	Five bags
3–5	4–6	5–7	6–8				
25	16	7					
				2m	Matches all four bags to the correct probabilities, ie	<p>! For 2m or 1m, bag matched to more than one probability Do not accept as a correct match</p>	
				or 1m	Matches two of the four bags to the correct probabilities		

Tier & Question				Mark	Correct response	Additional guidance	Bicycles
3–5	4–6	5–7	6–8				
26	17	8					
				2m	184		
				or 1m	Shows or implies a complete correct method with not more than one computational error eg <ul style="list-style-type: none"> • $\frac{46}{2} \times 8$ • 46×4 • $46 \div 2 = 22$ (error), $22 \times 8 = 176$ • $\frac{2}{8}$ is 46, so $\frac{4}{8}$ is 82 (error), so total is 164 • Digits 184 seen 		
					U1		

Tier & Question				Mark	Correct response	Additional guidance	Eggs
3–5	4–6	5–7	6–8				
		18	9				
				2m	<p>Indicates the grade is medium and shows or implies a correct method for calculating the mass of the egg that interprets the 'cubed' correctly, even if a final value is not shown</p> <p>eg</p> <ul style="list-style-type: none"> Value between 60 and 60.12 inclusive seen $5.5 \times 5.5 \times 5.5 \times \pi \div 10 \times 1.15$ $166.375 \times \pi \times 0.115$ 		
				or			
				1m	<p>Makes an incorrect or no decision about the grade of the egg, but shows or implies a correct method for calculating the mass of the egg that interprets the 'cubed' correctly, even if a final value is not shown</p> <p>eg</p> <ul style="list-style-type: none"> $5.5 \times 5.5 \times 5.5 \times \pi \div 10 \times 1.15$ $522.7 \div 10 \times 1.15$ <p>or</p> <p>Shows or implies a correct method for calculating the mass of the egg that interprets the 'cubed' correctly, with not more than one computational or rounding error, and makes their correct decision for the grade of the egg</p> <p>eg</p> <ul style="list-style-type: none"> $5.5^3 \times 3$ (error) $\div 10 \times 1.15 = 57(\dots)$, so medium $5.5^3 = 166$ (premature rounding), $166 \times 3.14 \times 0.115 = 59.9(\dots)$, so medium 		
						<ul style="list-style-type: none"> ✗ For 1m, final value and decision not shown within a method containing a computational or rounding error ✗ For 1m, conceptual error eg <ul style="list-style-type: none"> $5.5^3 = 16.5$, $16.5 \times \pi \div 10 \times 1.15 = 5.9(\dots)$ or 6, so small 	

Tier & Question				Mark	Correct response	Additional guidance	Ring size
3–5	4–6	5–7	6–8				
		19	10				
	a	a	1m	57 or 57.1(...) or 57.2			
	b	b	2m	Indicates size 6 and gives a correct justification eg <ul style="list-style-type: none"> • $51 \div \pi = 16.2(\dots)$ • $51 \div 3.14 = 16.2(\dots)$ • $16.5 \times \pi = 51.8(\dots)$ or 52 • $15.7 \times \pi = 49.(\dots)$ • $16.5 \times \pi = 51.8(\dots)$ and $15.7 \times \pi < 51$ 	✓ For 2m, minimally acceptable justification eg <ul style="list-style-type: none"> • 16.2(...) • 49.(...) and 51.8(...) or 52 seen ✗ For 2m, incomplete justification eg <ul style="list-style-type: none"> • $51 \div \pi$ • $51 \div 3.14$ • $16.5 \times \pi = 51.8(\dots)$ 		
			or 1m	Shows a correct justification but makes an incorrect or no decision or Indicates size 6 and gives an incomplete justification eg <ul style="list-style-type: none"> • $51 \div \pi$ • $51 \div 3.14$ • 51.8(...) or 52 • 49.(...) • $15.7 \times \pi < 51$ 	✗ For 1m, incorrect or no justification alongside a correct decision eg <ul style="list-style-type: none"> • $51 \div 3 = 17$, so size 6 • Because the circumference of a size 6 is 51 		

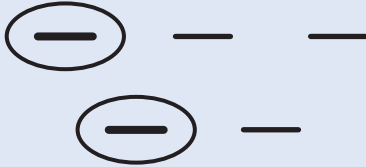
Tier & Question				Mark	Correct response	Additional guidance	Missing power
3–5	4–6	5–7	6–8				
		20	11				
				2m	<p>Shows correct working and gives the value of x as 3 eg</p> <ul style="list-style-type: none"> $3^5 + 10^2 = 343$ $7 \times 7 \times 7 = 343$ $3^5 = 243, 10^2 = 100$ $343 \div 7 = 49, 49 \div 7 = 7$ $\begin{array}{c} 343 \\ \swarrow \quad \searrow \\ 7 \qquad 49 \\ \swarrow \quad \searrow \\ 7 \qquad 7 \end{array}$ $7^3 = 343$ 	<p>! Value embedded Accept provided there is no ambiguity and correct working is shown eg, for 2m accept</p> <ul style="list-style-type: none"> 7^3 shown in correct working eg, for 2m do not accept 7^3 on the answer line, even with correct working 	
				or 1m	<p>Gives the value of x as 3, even if working is incomplete or omitted</p> <p>or</p> <p>Shows the value 343</p> <p>or</p> <p>Shows the values 243 and 100</p>		

Tier & Question						School size	
3–5	4–6	5–7	6–8	21	12		
				Mark	Correct response	Additional guidance	
				2m	Shows that the average number of pupils in a secondary school is about four times as many as the average number in a primary school eg <ul style="list-style-type: none"> Primary school: $4\ 069\ 385 \div 17\ 642 = 230(\dots)$ (or 231) Secondary school: $3\ 315\ 805 \div 3385 = 979(\dots)$ (or 980) $979 \div 230 = 4.2(\dots)$ $17\ 642 \div 3\ 385 = 5.2(\dots)$ $4\ 069\ 385 \div 3\ 315\ 805 = 1.2(\dots)$ $5.2(\dots) \div 1.2(\dots) = 4.2(\dots)$ or 4.3 recurring 	✓ For 2m, minimally acceptable justification eg <ul style="list-style-type: none"> $979(\dots) \div 230(\dots)$ $980 \div 231$ $4\ 100\ 000 \div 18\ 000 \div (3\ 300\ 000 \div 3000)$ $980, 4 \times 230 = 920$ $231, 980 \div 4 = 245$ 	
				or 1m	Shows the values $230(\dots)$ (or 231) and $979(\dots)$ (or 980) or Shows the intention to divide the total number of pupils by the number of schools for both categories using any reasonably rounded values eg <ul style="list-style-type: none"> $4\ 069\ 385 \div 17\ 642, 3\ 315\ 805 \div 3385$ $4\ 100\ 000 \div 18\ 000, 3\ 300\ 000 \div 3000$ $4\ 000\ 000 \div 18\ 000, 3\ 000\ 000 \div 3000$ 		
				U1			

Tier & Question						Container	
3–5	4–6	5–7	6–8	22	13		
				Mark	Correct response	Additional guidance	
				2m or 1m	15 Shows or implies a complete correct method with not more than one error eg <ul style="list-style-type: none"> $12000 \div 800$ $12000 \div (40 \times 20)$ Shows the digits 15 		

Tier & Question				Mark	Correct response	nth term expressions	Additional guidance															
3–5	4–6	5–7	6–8																			
		23	14																			
				3m	Completes all three rows of the table correctly, ie																	
					<table border="1"> <thead> <tr> <th>Expression</th> <th>... nth term expression?</th> <th>... 4th term</th> </tr> </thead> <tbody> <tr> <td>$5n$</td> <td>No</td> <td>✗</td> </tr> <tr> <td>$n + 11$</td> <td>No</td> <td>✗</td> </tr> <tr> <td>$11n - 6$</td> <td>Yes</td> <td>38</td> </tr> <tr> <td>$n^2(6 - n)$</td> <td>Yes</td> <td>32</td> </tr> </tbody> </table>	Expression	... n th term expression?	... 4th term	$5n$	No	✗	$n + 11$	No	✗	$11n - 6$	Yes	38	$n^2(6 - n)$	Yes	32		
Expression	... n th term expression?	... 4th term																				
$5n$	No	✗																				
$n + 11$	No	✗																				
$11n - 6$	Yes	38																				
$n^2(6 - n)$	Yes	32																				
				or																		
				2m	Completes two rows of the table correctly																	
				or																		
				1m	Completes either the row for the expression $11n - 6$ or the row for the expression $n^2(6 - n)$ correctly																	
				or																		
					Completes the middle column of the table correctly, even if the right-hand column is incorrect or omitted																	
							<ul style="list-style-type: none"> ✓ <i>Unambiguous indication of 'Yes' or 'No'</i> ✓ <i>Space for 4th term left blank for the expression $n + 11$</i> 															

Tier & Question				Mark	Correct response	Additional guidance	Exam
3–5	4–6	5–7	6–8				
		24	15				
				2m	90		
				or 1m	<p>Shows or implies a complete correct method</p> <p>eg</p> <ul style="list-style-type: none"> Total mark on 6 units must be $80 \times 6 = 480$ Total so far = $78 \times 5 = 390$ $480 - 390$ $80 \times 6 - 78 \times 5$ $80 - 78 = 2, 2 \times 5 = 10, 80 + 10$ <p>or</p> <p>Shows the value 480 or 390</p> <p>or</p> <p>Shows or implies a complete correct method with not more than one computational error</p> <p>eg</p> <ul style="list-style-type: none"> Total mark on 6 units must be $80 \times 6 = 420$ (error) $420 - 78 \times 5 = 30$ $80 \times 6 - 78 \times 5$ $80 - 78 = 2, 2 \times 5 = 10, 80 + 10$ 	<p>✓ For 2m, reference to 100 marks</p> <p>eg</p> <ul style="list-style-type: none"> 90 out of 100 $\frac{90}{100}$ 	

Tier & Question				Equations		
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
		25	16			
	a	a		1m	Indicates both correct equations, ie 	
	b	b		1m	Gives two pairs of coordinates for which $y = x + 1$ and gives a correct equation eg <ul style="list-style-type: none"> • (3, 4) and (0, 1) $y = x + 1$ • (1, 2) and (2, 3) $x = y - 1$ • (-2, -1) and $(\frac{1}{2}, 1\frac{1}{2})$ $y - x = 1$! Unconventional notation eg, for $y = x + 1$ • $y1 = 1 \times x + 1$ Condone

Tier & Question				House sales		
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
		26	17			
	a	a		1m	75 000	
	b	b		1m	$33\frac{1}{3}$! Value rounded Accept 33 or better
		c		1m	64 000	

Tier & Question						Standard form	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
			18	1m	Indicates 2×10^8 and 2.5×10^8 , in either order	✓ Unambiguous indication eg, for part (a) <ul style="list-style-type: none"> • 200 000 000 and 250 000 000 	

Tier & Question						Greater		
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance		
			19	a	1m	d , by 7		
				b	1m	f , by 1		

Tier & Question						Three years old	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
			20	2m or 1m	558 000 Shows the value 557 551.(...) or Shows a complete correct method with not more than one computational or rounding error, even if their value is not rounded to the nearest thousand eg <ul style="list-style-type: none"> • $546\,400 \div 98 \times 100$ • $550\,000$ (premature rounding) $\div 0.98 = 561\,224$ 	✓ 558 thousand ✗ For 1m, conceptual error eg <ul style="list-style-type: none"> • $0.02 \times 546\,400 + 546\,400 = 557\,328$ 	

Tier & Question						Height
3–5	4–6	5–7	6–8	Mark	Correct response	
			21			
				2m	7.2 or 7.18(...)	<p>✗ Method used is accurate or scale drawing</p> <p>! For 2m, answer of 7 Do not accept unless a correct method or a more accurate value is seen</p> <p>! Units given Ignore</p>
				or 1m	Shows or implies a correct trigonometric ratio eg <ul style="list-style-type: none"> • $17 \times \sin 25$ • $\frac{h}{17} = \sin 25$ • $17 \times \cos 65$ 	

Tier & Question						Fewest men
3–5	4–6	5–7	6–8	Mark	Correct response	
			22			
				2m or 1m	115 Shows the digits 114(...) or 115 or Shows a complete correct method with not more than one computational or rounding error eg <ul style="list-style-type: none"> • $100 \div 87 \times 100$ • $100 \div 87 = 1.1$ (<i>premature rounding</i>), $1.1 \times 100 = 110$ 	

Tier & Question						Daisies
3–5	4–6	5–7	6–8	Mark	Correct response	
			23			
			a	1m	32	
			b	1m	7	
			c	1m	25	

Tier & Question						Using Pythagoras	
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance	
			24				
				2m	20.8(...)	<p>! Value of 20 or 21 Do not accept unless a correct method or a more accurate value is seen</p> <p>! For 1m, value rounded or truncated Accept 9.1(...) or 9.2 Do not accept 9 unless a correct method or a more accurate value is seen</p>	
				or 1m	Shows or implies a correct method, using Pythagoras' theorem, for calculating the length of the missing side of the right-angled triangle with a hypotenuse of 22cm eg <ul style="list-style-type: none"> • $x^2 = 22^2 - 20^2$ • $x = \sqrt{84}$ • $\sqrt{(22^2 - 20^2)}$ • $\sqrt{84}$ • $2\sqrt{21}$ • 9.165 		
				U1			

Tier & Question				Mark	Correct response	Additional guidance	Booklet
3–5	4–6	5–7	6–8				
			25				
				3m or 2m	<p>60</p> <p>Shows a correct value for the mass of the booklet eg</p> <ul style="list-style-type: none"> • 59.8752 <p>or</p> <p>Shows or implies a correct method with not more than one error or omission, and follows through to give their value correct to 2 significant figures, provided some rounding is required eg</p> <ul style="list-style-type: none"> • $297 \times 420 \times 6 = 748\,440$, $748\,440 \times 80 = 59\,875\,200$, so 60 000 000 [failure to convert to m²] • $297 \times 420 \div 1000$ (error) = 124.74, $124.74 \times 6 \times 80 = 59\,875.2$, so 60 000 [incorrect conversion to m²] • $0.297 \times 0.42 \times 80 = 10$ [failure to find mass of 6 pages] 	<p>! For 2m, value rounded or truncated Accept 59, 59.8(...) or 59.9</p>	
				or 1m	<p>Shows or implies a correct method with not more than one error or omission, even if their value is not given correct to 2 significant figures eg</p> <ul style="list-style-type: none"> • $0.297 \times 0.42 \times 6 \times 80$ • $297 \times 420 \times 6 = 748\,440$, $748\,440 \times 80$ (error) = 59 875 200 • $0.297 \times 0.42 \times 80 = 9.9(\dots)$ 		

Tier & Question				26	Mark	Correct response	Additional guidance	Hemisphere																		
3-5	4-6	5-7	6-8																							
						<p>2m Completes the table correctly with two fully simplified expressions, ie</p> <table border="1"> <thead> <tr> <th>Radius</th> <th>Volume</th> <th>Surface area</th> </tr> </thead> <tbody> <tr> <td>r</td> <td>$\frac{2}{3}\pi r^3$</td> <td>$3\pi r^2$</td> </tr> </tbody> </table> <p>or</p> <p>1m Gives one correct and fully simplified expression</p> <p>or</p> <p>Gives both correct, unsimplified expressions eg</p> <ul style="list-style-type: none"> <table border="1"> <thead> <tr> <th>Radius</th> <th>Volume</th> <th>Surface area</th> </tr> </thead> <tbody> <tr> <td>r</td> <td>$\frac{4}{3}\pi r^3 \div 2$</td> <td>$2\pi r^2 + \pi r^2$</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Radius</th> <th>Volume</th> <th>Surface area</th> </tr> </thead> <tbody> <tr> <td>r</td> <td>$\frac{4}{6}\pi r^3$</td> <td>$3\pi r \times r$</td> </tr> </tbody> </table> 	Radius	Volume	Surface area	r	$\frac{2}{3}\pi r^3$	$3\pi r^2$	Radius	Volume	Surface area	r	$\frac{4}{3}\pi r^3 \div 2$	$2\pi r^2 + \pi r^2$	Radius	Volume	Surface area	r	$\frac{4}{6}\pi r^3$	$3\pi r \times r$		
Radius	Volume	Surface area																								
r	$\frac{2}{3}\pi r^3$	$3\pi r^2$																								
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