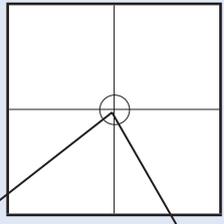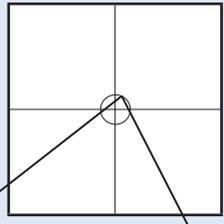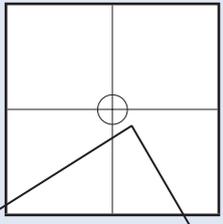| What if…	Marking procedure		
The pupil's response is numerically or algebraically equivalent to the answer in the mark scheme.	Markers should award the mark unless the mark scheme states otherwise.		
The pupil's response does not match closely any of the examples given.	Markers should use their judgement in deciding whether the response corresponds with the statement of the 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, should be accepted. Provided there is no ambiguity, condone the continental practice of using a comma for a decimal point.		
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 without altering the original intention or difficulty level of the question. For each misread that occurs, deduct one mark only.		
No answer is given in the expected place, but the correct answer is given elsewhere.	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.		
The final answer is wrong, but the correct answer is shown in the working.	Where appropriate, detailed guidance will be given in the mark scheme and must be adhered to. If no guidance is given, markers will need to examine each case to decide whether:		
	• the incorrect answer is due to a transcription error		If so, award the mark.
	• in questions not testing accuracy, the correct answer has been given but then rounded or truncated		If so, award the mark.
	• the pupil has continued to give redundant extra working which does not contradict work already done		If so, award the mark.
	• the pupil has continued, in the same part of the question, to give redundant extra working which does contradict work already done.		If so, do not award the mark. Where a question part carries more than one mark, only the final mark should be withheld.
The pupil's answer is correct but the wrong working is shown.	A correct response should always be marked as correct unless the mark scheme states otherwise.		

What if…	Marking procedure
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 correct response has been crossed or rubbed out and not replaced.	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.
More than one answer is given.	If all answers given are correct (or a range of answers is given, all of which are correct), the mark should be awarded unless prohibited by the mark scheme. If both correct and incorrect responses are given, no mark should be awarded.
The 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.
The answer is correct but, in a later part of the question, the pupil has contradicted this response.	A mark given for one part should not be disallowed for working or answers given in a different part, unless the mark scheme specifically states otherwise.
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 has drawn lines which do not meet at the correct point.	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. within the circle accepted on the circle accepted outside the circle not accepted

Responses involving money

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

Responses involving negative numbers

	✓ Accept	✗ Do not accept
For example: –2		To avoid penalising the error below more than once within each question, do not award the mark for the *first* occurence 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 time

	✓ Accept	✗ Do not accept
A time interval *for example:* 2 hours 30 minutes	✓ 2 hours 30 minutes Any unambiguous, correct indication, eg $2\frac{1}{2}$ 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
For example: (5, 7)	✓ Unconventional notation, eg (05, 07) (five, seven) $\overset{x\ \ y}{(5,\ 7)}$ $(x = 5,\ y = 7)$	✗ Incorrect or ambiguous notation, eg (7, 5) $\overset{y\ \ x}{(7,\ 5)}$ $(5x,\ 7y)$ $(5^x,\ 7^y)$ $(x - 5,\ y - 7)$

Responses involving probability

	✓ Accept	! Take care ✗ Do not accept
A numerical probability should be expressed as a decimal, fraction or percentage only. for example: $0.7 \quad \dfrac{7}{10} \quad 70\%$	✓ Equivalent decimals, fractions and percentages, eg 0.700 $\dfrac{70}{100}$ $\dfrac{35}{50}$ 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 $\dfrac{70}{100} = \dfrac{18}{25}$	! 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

Responses involving the use of algebra

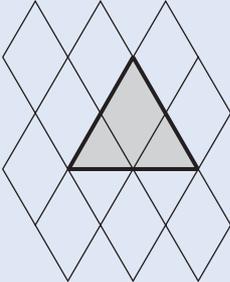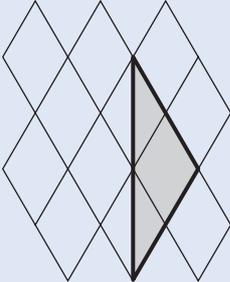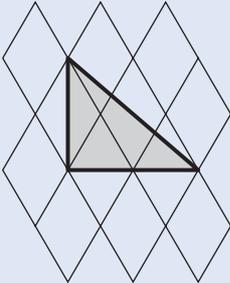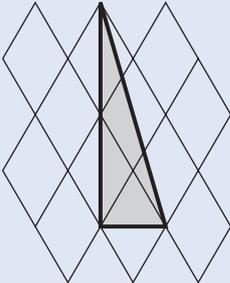|	✓ Accept	! Take care ✗ Do not accept
For example: $2 + n$ $n + 2$ $2n$ $\frac{n}{2}$ n^2	✓ Unambiguous use of a different case or variable, eg N used for n x used for n	! Unconventional notation, eg $n \times 2$, or $2 \times n$, or $n2$ or $n + n$ for $2n$ $n \times n$ for n^2 $n \div 2$ for $\frac{n}{2}$ 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 $n + 2$

Change

Tier & Question						
3–5	4–6	5–7	6–8			
7				**Mark**	**Correct response**	**Additional guidance**
a				**1m**	3	

b — **2m** — Completes all three rows of the table correctly in any order

eg

•

Number of 50p coins	Number of 20p coins	Number of 10p coins
2	3	0
2	2	2
2	1	4
2	0	6

or

1m — Completes two rows of the table correctly

✓ *Cell that should contain zero left blank*

Doctors

Tier & Question						
3–5	4–6	5–7	6–8			
8	**1**			**Mark**	**Correct response**	**Additional guidance**
a	a			**1m**	Gives a value between 49 and 53 inclusive	✓ *Value qualified* eg, for part (a) • About 50
b	b			**1m**	Gives a value between 23 and 27 inclusive	

c — **c** — **1m** — Gives a possible reason

eg
• They might think their doctor's treatment is some-times very good, but not at other times
• They might not think that any of the possible answers is what they think
• They don't have a doctor
• They might not want to comment
• They could be worried about giving an opinion
• They may have only ever had one doctor
• They don't always see the same doctor

✓ *Minimally acceptable reason*

eg
• Could be sometimes one category and some-times another
• They may not like the choices
• If they're not sure
• They don't see their doctor very often
• They have just got a new doctor
• Not relevant
• They don't want to answer
• They can't tell what is meant by good

✗ *Incomplete reason*

eg
• They don't know

Using tens

Tier & Question						
3–5	4–6	5–7	6–8			
9	2			Mark	Correct response	Additional guidance

1m	÷ 10	**! Correct operation indicated, but 10 omitted**
1m	÷ 10 ⟶ – 10	eg, for the first mark
1m	+ 10 ⟶ ÷ 10	• ÷
		Penalise only the first occurrence

Card shape

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

2m	Indicates only the three correct shapes, ie	✓ **Unambiguous indication**
	✓ _____ ✓	eg
	_____ _____ _____	• ✓ for yes and ✗ for no
	_____ _____ ✓	
	_____ _____ _____	
or		
1m	Indicates any two of the correct shapes with the third incorrect or omitted	**! For 1 mark, response indicates only the three shapes showing the grey side of the shape, eg**
	or	
	Indicates the three correct shapes with not more than one other incorrect	✓
		_____ _____ _____
		✓ ✓
		_____ _____ _____
		Condone

Number lines

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

1m	Gives both the values 2 and 8 in the correct positions	
1m	Gives the value –4 in the correct position	
1m	Gives the value (+)6 in the correct position	**! Follow-through from their –4**
		Accept the sum of their –4 and 10 provided their –4 is a negative number

Tier & Question						Rhombus grid
3–5	4–6	5–7	6–8			
12	5			Mark	Correct response	Additional guidance
a	a			1m	12	
b	b			1m	Draws a correct triangle eg	**!** *Lines not ruled or accurate, or triangle not shaded* Accept provided the pupil's intention is clear **!** *Vertices of triangle not on the intersections of the grid* Accept vertices within 2mm of the intersections of the grid **!** *Other shapes drawn* As these may be trials, ignore

Missing digits

Tier & Question					
3–5	4–6	5–7	6–8		
13	6			Mark	Correct response

Mark | **Correct response** | **Additional guidance**

1m Completes the second calculation correctly, ie

$$\boxed{1}\ \boxed{7} \times 3 = \boxed{5}\ \boxed{1}$$

1m Completes the third calculation correctly, ie

$$\boxed{1}\ \boxed{4} \times 3 = \boxed{4}\ \boxed{2}$$

or

$$\boxed{1}\ \boxed{5} \times 3 = \boxed{4}\ \boxed{5}$$

or

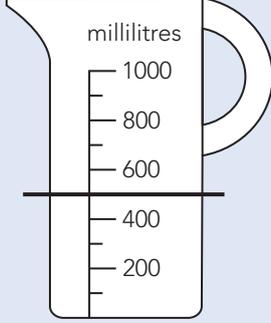$$\boxed{1}\ \boxed{6} \times 3 = \boxed{4}\ \boxed{8}$$

(U1)

Additional guidance

! *Both digits placed in the same box*
  eg
  • $\boxed{17}\ \boxed{} \times 3 = \boxed{5}\ \boxed{1}$

  Condone

Clocks

Tier & Question					
3–5	4–6	5–7	6–8		
14	7			Mark	Correct response

Mark | **Correct response** | **Additional guidance**

a	a	**1m** 10am
b	b	**1m** 6pm

Additional guidance

! *Indication of am or pm incorrect or omitted*
Condone omission of am or pm but do not accept incorrect times
eg, for part (a) accept
  • 10 (o'clock)
eg, for part (a) do not accept
  • 10pm
  • 22:00
eg, for part (b) accept
  • 6 (o'clock)
  • 18:00
eg, for part (b) do not accept
  • 6am
  • 06:00

Tier & Question							
3–5	4–6	5–7	6–8				**Sum of 80**
15	**8**			**Mark**	**Correct response**		**Additional guidance**

	1m	Indicates Set A
		and
		gives a correct explanation
		eg
		• A = 74 and 80 – 74 = 6
		   B = 90 and 90 – 80 = 10
		• A is –3, –2, –1, (0) and B is +1, +2, +3, +4,
		   so A is only 6 less than 80, but B is 10 more
		
		(U1)
			✓ *Minimally acceptable explanation*
			eg
			• 6 and 10 seen
			• 74 and 90 seen
			• (–)3, (–)2, (–)1, (0) and 1, 2, 3, 4 seen
			
			✗ *Incomplete or incorrect explanation*
			eg
			• A adds up to 74
			• B is 10 more than 80
			• A adds up to 74, B adds up to 110
			• 17, 18 and 19 are all under 20 so A is smaller

Tier & Question							
3–5	4–6	5–7	6–8				**Number chains**
16	**9**			**Mark**	**Correct response**		**Additional guidance**

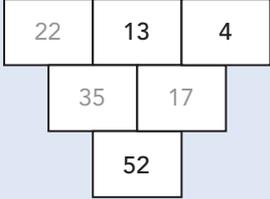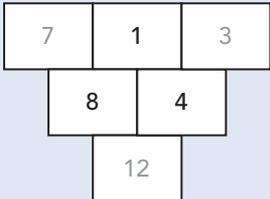| a	a			1m	Gives the values 14 and 41 in the correct positions	
b	b			1m	Shows a correct rule eg • × 3 • Multiply by 3 • Triple • × 3 then + 0	✓ *Minimally acceptable rule* eg • Add the number 3 times • Add on double itself • Double then add the number • It's the next power of 3 • 3× ! *Rule embedded or shown in working* Accept provided a correct rule is shown explicitly, even if an incorrect value for the next number in the chain is shown on the answer line eg, accept • 81 × 3 seen • (4 – 1) × 81 eg, do not accept • 81 + 81 + 81 • 81 × 2 + 81 ✗ *Incomplete or incorrect rule* eg • 3 • +54 • 3*n*

Making 1

Tier & Question						
3–5	4–6	5–7	6–8			
17	**10**	**1**		**Mark**	**Correct response**	**Additional guidance**

a	a	a	**2m**	Joins all four pairs of numbers correctly, ie	✘ *Number matched to more than one other* For 2m or 1m, do not accept as a correct match

			or		
			1m	Joins at least two pairs of numbers correctly	
b	b	b	**2m**	Joins all four pairs of numbers correctly, ie	

			or		
			1m	Joins at least two pairs of numbers correctly	

T-shirts

Tier & Question						
3–5	4–6	5–7	6–8			
18	**11**	**2**		**Mark**	**Correct response**	**Additional guidance**

a	a	a	**1m**	$\frac{1}{5}$ or equivalent probability	
b	b	b	**1m**	$\frac{2}{3}$ or equivalent probability	! *Value rounded* Accept 0.66(…) or 0.67 or the percentage equivalents
c	c	c	**1m**	$\frac{1}{3}$ or equivalent probability	! *Value rounded* Accept 0.33(…) or the percentage equivalent

Water

Tier & Question			
3–5	4–6	5–7	6–8
19	**12**	**3**	

Mark	Correct response	Additional guidance
1m (U1)	Indicates the value 500 on the jug, ie millilitres — 1000 — 800 — 600 — 400 — 200	✓ *Unambiguous indication* ! *Inaccurate indication* Accept provided the pupil's intention is clear

Boxes

Tier & Question			
3–5	4–6	5–7	6–8
20	**13**	**4**	

Mark	Correct response	Additional guidance

2m
 or
 1m
 	
 (U1)
	90
	
	 Shows or implies a complete correct method with not more than one computational error
	 eg
	 • $72 \div 4 = 16$ *(error)*
	    $72 + 16 = 88$
	 • $72 \div 4 = 18$
	    $18 \times 5 = 80$ *(error)*	

Percentages

Tier & Question			
3–5	4–6	5–7	6–8
21	**14**	**5**	

		Mark	Correct response	Additional guidance
a	a	a	**1m** 18	! *Throughout the question, incorrect use of % sign* eg • 18% 54% Penalise only the first occurrence
b	b	b	**1m** 54	! *For part (b) follow-through* Accept follow-through as their (a) × 3, or as 36 + their (a) provided the result is less than 360

Number grids

Tier & Question			
3–5	4–6	5–7	6–8
22	15	6	

Mark	Correct response	Additional guidance

1m Completes the first grid correctly, ie

22	13	4
	35	17
		52

1m Completes the second grid correctly, ie

7	1	3
	8	4
		12

(U1)

Angles in a triangle

Tier & Question			
3–5	4–6	5–7	6–8
23	16	7	

Mark	Correct response	Additional guidance

3m Gives all three correct angles, ie

$x = 90$
$y = 20$
$z = 20$

or

2m Gives any two correct angles

or

Gives $x = 90$ and $y = z$, provided this value is < 90 and > 0

or

1m Gives any one correct angle

or

Gives $y = z$, provided this value is < 90 and > 0

Tier & Question							**Finding b**

3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
24	**17**	**8**				

Mark	Correct response	Additional guidance

2m *or* **1m**	2
	
	 Shows or implies that a = 5 and shows the intention to substitute this value into the second equation
	 eg
	 • $5 + 7 = 10 + b$
	 • $b = 12 - 10$
	
	 or
	
	 Shows a complete correct method with not more than one computational error
	 eg
	 • $b = 11 - 6 + 7 - 10$
	 • $a = 11 - 6 = 6$ *(error)*
	      $6 + 7 = 10 + b$
	        $b = 3$
		✗ *Conceptual error*
		 eg
		 • $a = 11 + 6 = 17$

Tier & Question							**Matching**

3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
	18	**9**	**1**			

Mark	Correct response	Additional guidance
1m	Matches both instructions on the left to the equivalent instruction on the right, ie Add 0 — — — Subtract 0 Add 2 Subtract 2 Add $\frac{1}{2}$ Subtract $\frac{1}{2}$ Add –2 Subtract –2	✗ *Instruction on the left matched to more than one instruction on the right*

Oak leaves

Tier & Question				
3–5	4–6	5–7	6–8	
	19	10	2	

Mark	Correct response	Additional guidance

1m — Gives a correct reason from one of the five categories below that states or implies the problem, or suggests an improvement

The most common correct reasons:

Category 1: Refer to the number of leaves in the sample being too small
eg, problem
- The sample is too small
- Those 10 leaves might all be diseased
eg, improvement
- They should pick more than 10

Category 2: Refer to the number of trees in the sample being too small
eg, problem
- One oak tree might be different from others
- May be something wrong with that tree
eg, improvement
- They should use more than one tree

Category 3: Refer to the conditions in which the tree is growing being too uniform
eg, problem
- Different conditions may affect the leaves on other trees
- The soil might be very bad in that area
eg, improvement
- They should choose trees in different areas

Category 4: Refer to the area of the tree from which the leaves are picked being too small
eg, problem
- The leaves on higher branches might be different
- Those branches may not get enough light
eg, improvement
- They need leaves from all over the tree

Category 5: Refer to the period for picking the sample being too short
eg, problem
- The leaves may be different at different times of year
- It may be winter
eg, improvement
- They should collect throughout the year

Additional guidance

✓ *Minimally acceptable reason*
eg, problem
- Too small
- Only 10
- Not enough
- Just one
- Same growing conditions for the tree
- Other branches might be different
- Only the lowest branches
eg, improvement
- 100 is better
- More than one
- Need different areas
- Use other branches
- Collect at other times

! *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
- They need more trees from more areas
Mark as 1, 1

✗ *Incomplete reason that repeats the information given with no further explanation*
eg
- They are taking 10 leaves
- They are using one oak tree
- They are taking them from one part of the tree

1m
U1 — Gives a correct reason from a different category from one already credited

Tier & Question						

3–5	4–6	5–7	6–8			**Missing lengths**
	20	**11**	**3**	**Mark**	**Correct response**	**Additional guidance**

2m	Gives both correct lengths, ie
	$x = 10$ and $y = 3.9$ or equivalent
or	
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
	• $x = 10$, $10 - 6.1 = 4.9$ *(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						
3–5	4–6	5–7	6–8			**Counters**
	21	**12**	**4**	Mark	Correct response	Additional guidance

	a	a	a	2m *or* 1m	Gives the value 3, with no evidence of an incorrect method 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 eg • $6y + 1 = 4y + 7$ $6y - 4y = 7 - 1$ • $-2y + 7 = 1$ • $6y - 6 = 4y$ • $2y = 6$	! **Method used is trial and improvement** Note that no partial credit can be given
	b	b	b	2m *or* 1m (U1)	5 Gives an answer of 4.(…) or Shows or implies a correct inequality using the expressions for the bags eg • $4k > k + 12$ • $3k > 12$ • $k > 4$	! **Method used is trial and improvement** Note that no partial credit can be given

Tier & Question						
3–5	4–6	5–7	6–8			**Prize money**
	22	**13**	**5**	Mark	Correct response	Additional guidance

| | | | | 2m

or

1m | £ 490 000

Shows the value 980 000

or

Shows a complete correct method with not more than one error
eg
• 1 000 000 – 20 000 = *98 000 (error)*,
  98 000 ÷ 2 = 49 000 | ✓ **£ 490k**

✗ **For 1m, one million taken to be 100 000**
eg
• 100 000 – 20 000 = 80 000,
  80 000 ÷ 2 = 40 000

✗ **For 1m, computational error that simplifies the division**
eg
• 1 000 000 – 20 000 = 800 000,
  800 000 ÷ 2 = 400 000 |

Correlation

Tier & Question					
3–5	4–6	5–7	6–8		
	23	**14**	**6**	Mark	Correct response

Correlation

				Mark	Correct response	Additional guidance

a | a | a | 1m

Indicates B and gives a correct explanation

The most common correct explanations:

Refer to the 'slope' or 'gradient' of the points
eg
- The points make a pattern that is sloping upwards from left to right
- The line of best fit would have a positive gradient

Additional guidance:

✓ *Minimally acceptable explanation*
eg
- It slopes upwards
- It goes up
- It's like this ╱

✗ *Incomplete explanation*
eg
- It slopes the positive way

Describe the relationship between the two variables
eg
- As the value on the x-axis increases, so does the value on the y-axis

✓ *Minimally acceptable explanation*
eg
- As one amount gets bigger, so does the other
- It could be the higher the temperature, the more ice creams are sold

✗ *Incomplete explanation*
eg
- They both increase
- It goes from the left-hand corner
- It is slanted towards the right

b | b | b | 1m

Indicates A and gives a correct explanation

The most common correct explanations:

Refer to the points being closer to a line of best fit
eg
- 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

Additional guidance:

✓ *Minimally acceptable explanation*
eg
- They are closer to one line
- In B they are less bunched together in a line

✗ *Incomplete explanation*
eg
- The points are closer together
- In B they are more spread out

Refer to the 'line' or sloping pattern being clearer to see
eg
- 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

✓ *Minimally acceptable explanation*
eg
- 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

✗ *Incomplete explanation*
eg
- The pattern is clearer
- They are in a line

Tier & Question						Shape rules
3–5	4–6	5–7	6–8			
	24	15	7	Mark	Correct response	Additional guidance

Mark	Correct response	Additional guidance
2m	Completes all three rules correctly, ie $$H = \underline{N} + 1$$ $$A = \underline{H} \times 2$$ $$\underline{A} = 2N + 2$$	**! Throughout the question, unconventional notation** eg, for the first rule • 1 N + 1 Condone
		! Throughout the question, words used instead of letters eg, for the second rule • $A = \underline{Height} \times 2$ Penalise only the first occurrence
		! For the second rule, N + 1 used Accept provided there is no ambiguity eg, accept • $(N + 1) \times 2$ eg, do not accept • $N + 1 \times 2$
		✓ **For the third rule, 2H used**
or **1m**	Completes two rules correctly	

Tier & Question						Fortieths
3–5	4–6	5–7	6–8			
	25	16	8	Mark	Correct response	Additional guidance

Mark	Correct response	Additional guidance
1m	0.775	✗ **Equivalent fractions**
1m	0.575	✓ **Follow-through as their value for the first mark – 0.2**

Tier & Question					Expressions

3–5	4–6	5–7	6–8		
	26	**17**	**9**	Mark	Correct response	Additional guidance

3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance

	a	a	a	1m	Indicates 2n must be even and gives a correct explanation
					eg
					• Any whole number multiplied by two gives a number in the two times table, so is even
					• Odd × 2 = even,
					  even × 2 = even
					• 2 × odd is odd + odd = even
					  2 × even is even + even = even
					• All multiples of 2 are even
					• Halving an odd number does not give a whole number
					
					(U1)
						✓ *Minimally acceptable explanation*
						eg
						• × 2 gives even
						• Doubling any number gives even
						• All the numbers in the 2 times table are even
						
						✗ *Incomplete explanation*
						eg
						• 2 × 1 = 2 which is even, and 2 × 2 = 4 which is also even
						• Even × even is even
						  Even × odd is even
						• Because when you add two odd numbers together you always make an even
						• Because 2 is even

	b	b	b	1m	Indicates 3n could be odd or even and gives a correct explanation
					eg
					• 3 × 1 = 3 which is odd, but 3 × 2 = 6 which is even
					• Odd × 3 = odd,
					  even × 3 = even
					• Multiples of 3 can be odd or even
					• An even or odd number can have a factor of 3
					
					(U1)
						✓ *Minimally acceptable explanation*
						eg
						• 3 × 1 = 3, 3 × 2 = 6
						• If n is 5 you get odd, if n is 6, you get even
						• 3 × some numbers = odd, but 3 × some numbers = even
						• Because 3 goes into both odd and even numbers
						• In the 3 times table there are odd and even numbers
						
						✗ *Incomplete explanation*
						eg
						• 3n is sometimes odd and sometimes even
						• Even × odd gives even
						  odd × odd gives odd
						• 3, 6, 9, 12, 15…..

Ratio

Tier & Question						
3–5	4–6	5–7	6–8			
	27	**18**	**10**	Mark	Correct response	Additional guidance

	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 • 5 black beads, 1 white bead • 8 black beads, 3 white beads • 11 black beads, 5 white beads (U1)

Additional guidance:

Markers may find the following list of correct examples helpful:

Black	White
5	1
8	3
11	5
14	7
17	9
20	11

Powers

Tier & Question						
3–5	4–6	5–7	6–8			
	28	**19**	**11**	Mark	Correct response	Additional guidance

Mark	Correct response	Additional guidance

1m	Gives a correct justification that the difference between 3^2 and 3^3 is 18
	eg
	• $3^2 = 9$, $3^3 = 27$, and $27 - 9 = 18$
	• $3^3 - 3^2 = 3^2(3 - 1)$
	          $= 9 \times 2$
	          $= 18$
		✓ *Minimally acceptable justification*
		eg
		• $27 - 9$
		• $9 + 18 = 27$
		
		✗ *Incomplete or incorrect justification*
		eg
		• $3^2 = 9$, $3^3 = 27$
		• $3^3 - 3^2 = 18$
		• $9 - 27 = 18$

2009 KS3 Mathematics test mark scheme: Paper 2 — Tiers 3–5, 4–6

Tier & Question					
3–5	4–6	5–7	6–8		**Digital**
9				Mark	Correct response

Digital

Mark	**Correct response**

Additional guidance

1m 10:45

! *Indication of am or pm*
Condone either am or pm shown or implied
eg, accept
- 10:45 am
- 22:45

1m Gives a correct description of the time in words
eg
- Five past ten

! *Words and numbers used in description*
Condone, provided the time has been interpreted correctly
eg, accept
- 5 past 10

✘ *'Digital time' described in words*
eg
- Ten O five

✘ *Description of time incorrect or using numbers*
eg
- Ten five
- 10 5

Tier & Question					
3–5	4–6	5–7	6–8		**Reflecting**
10	**1**			Mark	Correct response

Reflecting

Mark	**Correct response**

Additional guidance

1m Reflects the shape correctly in the mirror line, ie

! *Throughout the question, lines not ruled or accurate*
Accept provided the pupil's intention is clear

! *Throughout the question, extra lines drawn*
Accept provided the pupil's intention is clear

1m Reflects the shape correctly in the mirror line, ie

Test

Tier & Question						
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
12	**2**					
a	a			**1m**	C	
b	b			**1m**	21	
				U1		

Rounding

Tier & Question						
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
13	**3**					
a	a			**1m**	2700	
				1m	3000	
b	b			**1m**	Gives a value greater than or equal to 795 but less than 805	✓ *800*

Castle

Tier & Question						
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
11	**4**					
				2m *or* **1m**	£ 5(.00) Shows the value 22(.00) or Shows or implies a complete correct method with not more than one computational error eg • *12.00 (error) + 9 = 21.00* Answer given as 4.00	

Baby

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
14	**5**					
a	a			**1m**	4	✘ *Any reference to extra days*
b	b			**1m**	9	✘ *Any reference to extra weeks or days*

Count on

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
15	**6**					
a	a			**1m**	27	
b	b			**2m** or **1m**	1 Shows or implies that the size of two steps is 4 eg • • −3 + 4 or Shows or implies that the size of one step is 2 eg • The gaps are 2 • −3 + 2 • Second number is −1 • Fourth number is 3 • −3 to 5 is 8, 8 ÷ 4	✘ *Shows steps of unequal size*
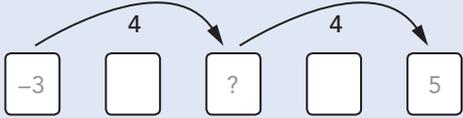
U1

Shoe sizes

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
16	**7**					
a	a			**1m**	12	
b	b			**1m**	3	
c	c			**1m**	Indicates **Both the same** and gives a correct explanation The most common correct explanations: Use given values eg • Range of boys is 4, range of girls is 4 • 8 – 4 is the same as 9 – 5 • 5 to 9 = 4 to 8 Reason generally about spread eg • Boys cover 5 sizes, girls cover 5 sizes	✓ *Minimally acceptable explanation* eg • 4, 4 • 8 – 4, 9 – 5 • Both 4 ! *Ambiguous notation* eg • 4 – 8, 5 – 9 Condone ✓ *Minimally acceptable explanation* eg • Both have the same number of sizes ! *Explanation implies references to the number of blank sizes* eg • Boys have one blank, girls have one blank • Because the girls didn't have size 9 and the boys didn't have size 4 Condone ✗ *Ambiguous or incorrect explanation* eg • 5 in each • They both have a range of five sizes • Girls: 4, 5, 6, 7, 8 Boys: 5, 6, 7, 8, 9

(U1)

2009 KS3 Mathematics test mark scheme: Paper 2 — Tiers 3–5, 4–6

Finding *x* and *y*

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
17	8			1m	652	
				1m	442	

Seventy

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
18	9			1m U1	Indicates No and gives a correct explanation that shows or implies at least one odd factor eg • Factors of 70 are 1, 2, 5, 7, 10, 14, 35 and 70, so some are odd and some are even • There are four odd factors and four even factors of 70 • It could be 1 (odd) • 5 × 14 = 70 • 70 ÷ 2 = 35 • 70 is even, but 1 is odd and goes into everything	✓ *Minimally acceptable explanation* eg • 1, 2, 5, 7, 10, 14, 35 and 70 • 7 ! *Incomplete list of factors given* Condone, provided none is incorrect and at least one odd factor is shown eg, accept • The factors of 70 are 1, 2, 5 and 7 ✗ *Incomplete or incorrect explanation* eg • 70 has some odd and some even factors • 70 is a factor of 1 • All factors of 70 are odd

2009 KS3 Mathematics test mark scheme: Paper 2 **Tiers 3–5, 4–6, 5–7**

Tier & Question					Units
3–5	4–6	5–7	6–8		
20	**10**	**1**		**Mark** **Correct response**	**Additional guidance**

2m — Completes all five rows of the table correctly, ie

	L	A	V	M
cm	✓			
l			✓	
miles	✓			
g				✓
m²		✓		
oz				✓

or

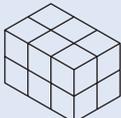**1m** — Completes at least three rows of the table correctly

Tier & Question					Rainforest
3–5	4–6	5–7	6–8		
19	**11**	**2**		**Mark** **Correct response**	**Additional guidance**

a	a	a	**1m**	27
b	b	b	**1m**	175 to 185 inclusive
c	c	c	**1m**	Indicates January, ie

Tier & Question					

3–5	4–6	5–7	6–8		**Doughnuts**
21	**12**	**3**		**Mark**　**Correct response**	**Additional guidance**

2m　Indicates shop A
and
gives a correct justification, based on correctly calculating a pair of comparable values
eg
- At shop A: 2 × 5 = 10,
  at shop B: 3.5(0) × 3 = 10.5(0)
- 3.5 × 3 − 2 × 5 = 0.5
- 2 ÷ 3 = 0.6(…),
  3.50 ÷ 5 = 0.7
- For £1 you get $1\frac{1}{2}$ doughnuts or $1\frac{3}{7}$ doughnuts
- You pay £1.50 extra for 2 more doughnuts, but at shop A they're less than 75p each so shop A must be a better deal

or
1m　Shows a correct pair of comparable values but makes either an incorrect or no decision

or

Shows a complete correct method for finding a pair of comparable values with not more than one computational or rounding error, and follows through to make their correct decision
eg
- 5 × 2, 3 × 3.50, shop A indicated
- 2 ÷ 3 = *0.75 (error)*,
  3.50 ÷ 5 = 0.7, shop B indicated

or

Makes a correct decision but the justification uses only the difference between a pair of comparable values
eg
- A doughnut is 3.3(…)p cheaper at shop A

✘　*For 2m, no decision*

✓　*For 2m, correct decision and any pair of comparable values shown*
Note that common pairs (in pounds) are:
10 and 10.5(0)　　　　　(per 15 doughnuts)
0.6(…) and 0.7(0)　　　　(per 1 doughnut)
2 and 2.1(0)　　　　　　(per 3 doughnuts)
3.3(…) and 3.5(0)　　　　(per 5 doughnuts)
1.5 and 1.4(…)　　(doughnuts per pound)

!　*For 2m or 1m, comparison is per 3 doughnuts or per 5 doughnuts but the given price is not restated*
Condone
eg, for 2m accept
- At shop B, 3 doughnuts would be £2.10

!　*Additional incorrect working*
Ignore

Stopping distances

Tier & Question					
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance

			Mark	Correct response	Additional guidance
a	a	a	1m	Draws a bar for the stopping distance for 40mph of length 9cm, ie	! *Bar incorrectly positioned* Condone if bar is drawn correctly one line above or below the position shown
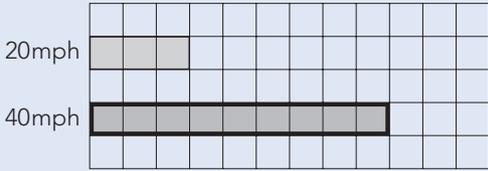
20mph
40mph

			Mark	Correct response	Additional guidance
b	b	b	1m	18	! *Follow-through* Allow follow-through as 2 × the length of their bar in (a), provided the result is greater than 12

Rotate 180

Marking overlay available

Tier & Question					
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
23	14	5			

Mark	Correct response	Additional guidance
2m or 1m	Draws the correct shape with all four vertices within the tolerances as shown on the overlay	! *Lines not ruled or accurate* Accept provided the pupil's intention is clear
	Shows at least three vertices within the tolerances as shown on the overlay	
	or	
	Shows a correct shape in the correct orientation, with all four vertices within the tolerances as shown on the overlay, but in an incorrect position on the grid	

Value

Tier & Question					
3–5	4–6	5–7	6–8	Mark	Correct response	Additional guidance
24	15	6			

Mark	Correct response	Additional guidance
1m	196	✗ *Incomplete processing*
1m	4	
1m	1225	

12 cubes

Tier & Question					
3–5	4–6	5–7	6–8		
25	16	7			

Mark	Correct response	Additional guidance

2m

Draws a 1 by 1 by 12, a 1 by 3 by 4 or a 2 by 2 by 3 cuboid, using the isometric grid

eg

-

-

-

Additional guidance
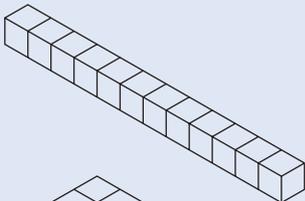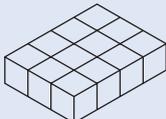
✘ *1 by 2 by 6 cuboid repeated*

✓ *For 2m or 1m, internal lines omitted*
eg, for 2m accept

-
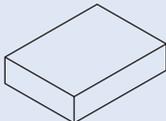
! *For 2m or 1m, hidden lines shown*
For 2m, accept provided they are clearly indicated as hidden lines
eg, for 2m accept

-
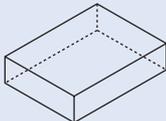
! *Lines not ruled*
Accept provided the pupil's intention is clear

! *Drawing not accurate*
Accept vertices within 2mm of the dots of the grid

✘ *Isometric grid not used correctly*
eg

-
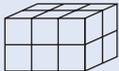
! *Other shapes drawn*
As these could be trials, ignore

or
1m

The only error is to omit some external lines or to show some hidden lines

eg

-

-
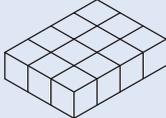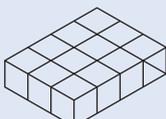
or

Correctly draws a possible 3-D shape made from 12 cubes that is not a cuboid, using the isometric grid

eg

-

Cost of delivery

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
26	17	8				
a	a	a		**1m**	Gives both correct values correctly positioned, ie 7 then 20	✓ *Range given instead of 20* eg • 0 – 20
				1m	Gives a correct value with the correct unit for that value eg • 25p • 25 pence • £0.25	
b	b	b		**1m**	18.25	

Shape area

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
27	18	9				

| a | a | a | | 1m | Gives a shape with area $a + 2b$, ie 16 small triangles eg | ! *Lines not ruled or accurate* Accept provided the pupil's intention is clear |
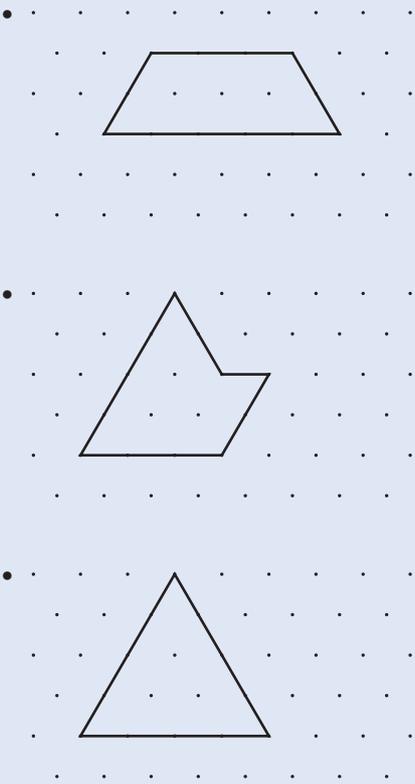
✓ *Internal lines shown* eg, for part (a)
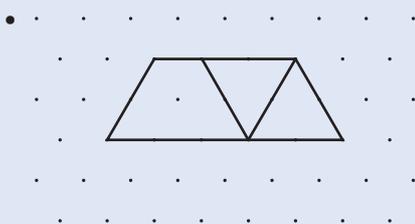
✗ *Shape formed with triangles and trapezium not joined side to side* eg, for part (a)
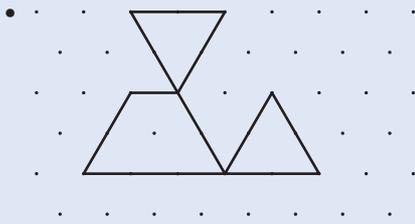
! *Other shapes drawn* As these could be trials, ignore

| b | b | b | | 1m | Gives a shape with area $a - b$, ie 4 small triangles eg | |

U1

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			**Midpoints**
	19	**10**	**1**			

Mark	Correct response	Additional guidance
1m	Gives P as (30, 35)	
1m	Gives Q as (42, 0)	**!** *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
1m U1	Gives R as (42, 35)	**!** *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

Rainfall

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
	20	11	2			

2m Indicates place A
and
gives a correct justification
eg
- $10 \times 8 + 20 \times 4 = 160$cm
  $5 \times 10 + 50 \times 2 = 150$cm
- $(80 + 80) \div 12 = 13.(…)$cm per month
  $(50 + 100) \div 12 = 12.5$cm per month
- $(80 + 80) \div 2 = 80$cm per 6 months
  $(50 + 100) \div 2 = 75$cm per 6 months

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)

Additional guidance

✓ *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

Thinking distances

Tier & Question				Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8			
	21	12	3			
	a	a	a	2m *or* 1m		
	b	b	b	1m	50	

2m 315

or

1m 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 **1m** 50

Two shapes

Tier & Question						
3–5	4–6	5–7	6–8			
	22	13	4	Mark	Correct response	Additional guidance

2m	60	
or		
1m	Shows the value 6	
	or	
	Shows a complete correct method with not more than one computational error	
(U1)	eg	
	• 72 ÷ 12 = *8 (error)*, 10 × 8 = 80	

Recycling

Tier & Question						
3–5	4–6	5–7	6–8			
	23	14	5	Mark	Correct response	Additional guidance

2m	760 000	
or		
1m	Shows the value 1 240 000	
	or	
	Shows a complete correct method with not more than one error	
	eg	
	• 2 000 000 × 0.38	
	• 38 ÷ 100 × 2 × 1 000 000	
	• 2 million = *20 000 000 (error)*	
	20 000 000 × 0.38 = 7 600 000	

Shapes on a grid

Tier & Question			Mark	Correct response	Additional guidance
3–5	4–6	5–7	6–8		
	24	15	6		

			Mark	Correct response	Additional guidance
a	a	a	1m	Gives a correct explanation The most common correct explanations: Refer to the sum of the angles in a triangle eg • The angles are equal and add up to 180, so 180 ÷ 3 = 60 • Angles in a triangle add up to 180, the three angles are equal so 60 + 60 + 60 = 180	✓ *Minimally acceptable explanation* eg • 180 ÷ 3 • 60 × 3 = 180 • The angles are the same and add up to 180 ✗ *Incomplete explanation* eg • 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

Refer to the sum of angles at a point
eg
• You can see that six of the triangles fit together at a point, so 360 ÷ 6 = 60

•
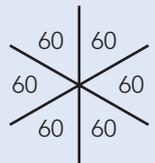
Total: 360

✓ *Minimally acceptable explanation*
eg
• 360 ÷ 6
• 60 × 6 = 360

✗ *Incomplete explanation*
eg
• Six of the angles add up to 360
• Angles at a point add up to 360
• 60 × 6

			Mark	Correct response	Additional guidance
b	b	b	2m or 1m U1	Gives all three correct angles, ie $a = 60$, $b = 120$ and $c = 240$ Gives two correct angles	! *For 1m, follow-through* Provided their b is obtuse, accept c as $2 × $ their b or $360 – $ their b

Five bags

Tier & Question			
3–5	4–6	5–7	6–8
	25	16	7

Mark	Correct response	Additional guidance
2m	Matches all four bags to the correct probabilities, ie	! *For 2m or 1m, bag matched to more than one probability* Do not accept as a correct match
or 1m	Matches two of the four bags to the correct probabilities	

Bicycles

Tier & Question			
3–5	4–6	5–7	6–8
	26	17	8

Mark	Correct response	Additional guidance
2m or 1m	184 Shows or implies a complete correct method with not more than one computational error eg • $\frac{46}{2} \times 8$ • 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 (U1) • Digits 184 seen	