Contents

1 Number

1.1 Place value, ordering and rounding

Tier & Question		Using Number Lines	
1			
		Correct response	**Additional guidance**
	1m	**50** and **75**; correctly placed	
	1m	**20, 40, 60, 80**; correctly placed	
	2m *or* **1m**	**40, 80, 120, 160**; correctly placed Any three correct, with follow through of steps of 40 from not more than one incorrect value eg ■ 40, 80, 120, *170 (error)* ■ 40, *90 (error)*, 130, 170 ■ *50 (error)*, 90, 130, 170	**!** ***Follow through as double their values from part (b)*** Accept provided their values form an increasing sequence eg, from part (b) as 20, 40, 50, 70 accept for 1m ◆ 40, 80, 100, 140 **✖** ***Follow through values greater than 200***
	1m	**4**	

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

Tier & Question				Sizing	
		3		Correct response	Additional guidance
		a	**2m**	Gives the four values in the correct order eg ■ 3^2 2^4 5^2 3^3 smallest largest ■ 9 16 25 27 smallest largest	
			or **1m**	Shows any three of the values 25, 9, 27, 16, with no evidence of an incorrect method for a correct value or Gives the four values in order of size, largest to smallest	
		b	**2m**	78 125	✗ *Follow through using their value for 5^2 from part (a)*
			or **1m**	Shows the value 78 125, even if there is subsequent incorrect working or Shows or implies a complete correct method, with at least some correct processing, with not more than one computational error eg ■ 3125 × 100 = 312 500, 312 500 ÷ 4 ■ 3125 × 5 = 15 625, 15 625 × 5 ■ 3125 × 25 = *15525 (error)*, 62500, 78025 ■ 3125 × 10 ÷ 2 = *15 125 (error)*, 15 125 × 10 ÷ 2 = 75 625	✗ *Conceptual error* eg • 3125 × 25 = 15625, 6250, 21875 • 5^5 = 3125, 5^2 = 25, 3125 + 25 = 3150 • 5^2 = 10, 3125 × 10 = 31 250

Tier & Question		Rounding		
	4			
			Correct response	**Additional guidance**
	a	**2m**	8.7×10^4	! ***Throughout the question, zero(s) given after the last decimal place within standard form notation*** Condone eg, for 2m in part (a) accept • 8.7000×10^4
		or		
		1m	Shows the value 86 790, not expressed in any kind of index form or Shows the digits 87	
	b	**2m**	1×10^{-3}	
		or		
		1m	Shows the value 0.000 867 9 or equivalent, not expressed in any kind of index form or Shows the value 0.001 or equivalent eg ■ 0.1×10^{-2} or Shows the value 0.000 9 or equivalent eg ■ 9.0×10^{-4} ■ 0.9×10^{-3}	

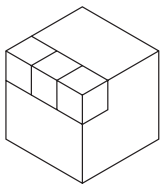
1.2 Integers, powers and roots

Tier & Question		Puzzling out		
	1			
			Correct response	Additional guidance
		2m	Indicates the numbers 1, 3, 5, 7, 9 in any order	
		or		
		1m	Indicates any five numbers that are less than 10 eg ■ 0, 2, 4, 6, 8 ■ 7, 7, 1, 2, 6 ■ –4, –4, –4, –4, –1.5 or Indicates any five odd numbers eg ■ 7, 7, 15, 13, 9	
		(U1)		

Tier & Question				Prime grid		
		2			Correct response	Additional guidance
				1m U1	Gives a correct explanation The most common correct explanations: State that 35 is a multiple of 5 and/or 7 eg ▪ 35 is a multiple of 5 ▪ 7 is a factor of 35 State that prime numbers have only two factors but that 35 has more than two factors eg ▪ A prime has 2 factors, 35 has 4 State that the last digit of any prime number greater than 5 is 1, 3, 7 or 9 eg ▪ All prime numbers must end in 1, 3, 7 or 9 with the exception of 2 and 5	✓ *Minimally acceptable explanation* eg • 5 goes into it • It's in the 7 times table • 7 × 5 • 1, 5, 7, 35 • It has more than two factors • 35 divides by more than one and itself × *Incomplete explanation* eg • 35 is in some of the times tables • 35 has factors • Because it ends in 5 ! *Correct explanation accompanied by a statement that uses mathematical language incorrectly* Throughout the question, condone eg, for part (a) accept • 35 has more than 2 factors, eg 35 goes into 5 • 5 goes into 35, so it has 2 factors
				1m U1	Gives a correct explanation The most common correct explanations: State or imply the numbers in column Y will all be multiples of 6 (or 2, or 3) eg ▪ They are all in the 6 times table, so they must be multiples of 6 ▪ They are all multiples of 3 State or imply the numbers in column Y will all have a factor of 6 (or 2, or 3) eg ▪ They all have a factor of 3 ▪ 2 is the only prime that is even and all these numbers are even and greater than 2	✓ *Minimally acceptable explanation* eg • It's the 6 times table • You can divide them by 3 • They are all even • The only even prime is 2 • None of the numbers ends in 1, 3, 7 or 9 ✓ *That column Y starts at 6 is not explicitly stated* Condone eg, accept • They are all even and even numbers are never prime × *Incomplete explanation* eg • They are all in times tables • They all divide by something other than one and itself • 6 ÷ 3 = 2 • It goes up 6 each time ! *Misunderstanding of prime* A common misconception is to confuse prime with odd. Hence do not accept statements that refer only to odd eg, do not accept • The numbers are not odd

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

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

Tier & Question				Cubes		
		5			Correct response	Additional guidance
				2m	27	
				or		
				1m	Shows the values 216 (or 6^3 or $6 \times 6 \times 6$) and 8 (or 2^3 or $2 \times 2 \times 2$), even if there are errors or Shows or implies that 3 of the smaller cubes will fit along each edge of the larger cube eg ▪ 3^3 or $3 \times 3 \times 3$ ▪ 3 by 3 by 3 ▪ 	

Tier & Question					Number cards	
			6		Correct response	Additional guidance
				2m	Gives all three correct values, ie 15 20 25 in any order	
				or		
				1m	Gives any two correct values, with not more than one error or omission or	
					States or implies that n is a multiple of 5 and that there are $\frac{n}{5}$ square numbers eg ▪ There must be 1 out of 5, 2 out of 10, 3 out of 15 etc for the fraction to be right ▪ (1) 2 3 (4) 5, but should be only one 6 7 8 (9) 10, but should be only two 11 12 13 14 15, correct	! ***For 1m, minimally acceptable implication*** For 1m, accept responses in which there are at least three examples using multiples of 5, (with no examples not using multiples of 5) and some square numbers identified, even if there are errors or omissions eg ◆ 1, 2, 3, 4, 5, so n could be 5 6, 7, 8, 9, 10, so n could be 10 11, 12, 13, 14, 15
				(U1)		

1.3 Fractions, decimals and percentages

Tier & Question				Cards		
1					**Correct response**	**Additional guidance**
a				**1m**	£ 3.20	
b				**1m**	£ 102(.00)	
c				**1m**	**14**	

Tier & Question				Thinking fractions		
2					**Correct response**	**Additional guidance**
				1m	40	
				1m	150	
				1m	30	

Tier & Question				Ages (cont)		
		3			Correct response	Additional guidance
b	b	b		**2m**	Gives all three correct expressions in their simplest forms eg ▪ $n + 4$, n, $2n + 1$	✓ ***1n or n1 for n in a fully simplified expression*** × ***n 0 as a fully simplified expression for n*** ! ***Use of multiplication sign*** If a multiplication sign is used, an expression cannot be accepted as fully simplified eg, for Carol, do not accept as fully simplified ◆ $2 \times n + 1$
				or		
				1m	Gives any two correct expressions in their simplest forms or Gives all three correct expressions, even if not simplified	
c	c	c		**1m**	61	× ***Incomplete processing*** eg, for the first mark ◆ $2 \times 30 + 1$ eg, for the second mark ◆ 2×31 × ***Incorrect notation*** eg, for the first mark ◆ $61n$
				1m	62	

Tier & Question				Fractions		
4					Correct response	Additional guidance
				1m	$\frac{1}{3}$ or equivalent fraction	! ***Decimals used*** For $\frac{1}{3}$, accept 0.33 or better For $\frac{7}{12}$, accept 0.58, 0.583(...) For $\frac{1}{6}$, accept 0.17, 0.16, 0.166(...)
				1m	$\frac{7}{12}$ or equivalent fraction	
				1m	$\frac{1}{6}$ or equivalent fraction	

Tier & Question				Giant pandas		
			5		Correct response	Additional guidance
				2m	1100	! *For 2m upper bound used* Since pupils could assume 1600 is given to the nearest 100 in the context of the question, accept use of upper bound provided a correct method is seen eg, for 2m accept • 1650 ÷ 140 × 100, answer: 1200
				or		
				1m	Shows the digits 11(…) or Shows or implies a complete correct method eg ▪ 1600 ÷ 140 × 100 ▪ $\frac{1600}{1.4}$ ▪ $\frac{160\,000}{140}$	✓ *For 1m, lower and/or upper bound used within a correct method* eg, for 1m accept • 1650 ÷ 140 × 100 • 1550 ÷ 1.4

1.4 Ratio and proportions

Tier & Question					Squares	
	1				**Correct response**	**Additional guidance**
a	a			**1m**	**9**	! *Units given* Ignore
b	b			**1m**	**4**	
c	c			**1m** **1m**	**4** **14**	! *Answers for part (c) reversed* Mark as 0, 1

Tier & Question					Ratio of ages	
	2				**Correct response**	**Additional guidance**
	a	a		**1m**	7 : 5	! *Ratio correct but not written as simply as possible* Provided there is no incorrect simplification, penalise only the first occurrence ! *Incorrect order* If the only error is to write each ratio in the incorrect order, ie 5 : 7 and 6 : 7, do not award the mark for part (a) but award the mark for part (b)
	b	b		**1m**	7 : 6	
	c	c		**1m** U1	Indicates No and gives a correct explanation eg ■ That would make their ages equal which is not possible as the sister is 6 years younger ■ They will never be the same age as he is always 6 years older ■ To make them the same age, Paul would have to stop getting older for a number of years	✓ *Minimally acceptable explanation* eg • They'd be the same • They are not the same age • His sister is 6 years younger • Paul is older • They were born in different years • That would mean Paul had stopped getting older for a number of years • That means they would've had to be the same age in the first place × *Incorrect statement* eg • She will always be 8 years younger × *No or incomplete interpretation* eg • 7 : 7 is the same as 1 : 1 • It wouldn't be equal

Tier & Question				Hands		
	2				Correct response	Additional guidance
	a	a	a	1m	$\frac{7}{15}$ or equivalent probability	! *Value rounded or truncated* Accept 0.46(…) or 0.47 or the percentage equivalents Do not accept 0.5 unless a correct method or a more accurate value is seen
	b	b	b	1m	$\frac{1}{10}$ or equivalent probability	! *Follow through* Accept follow through from an incorrect total number of pupils seen in part (a), provided their total is not 4, 16 or 27 eg, from $\frac{14}{29}$ for part (a) accept • $\frac{3}{29}$
	c	c	c	1m	$\frac{2}{3}$ or equivalent probability	! *Value rounded* Accept 0.66(…) or 0.67 or the percentage equivalents

Tier & Question				Grey and black designs		
	4				Correct response	Additional guidance
	a	a	a	1m	25	× *Equivalent fractions or decimals*
	b	b	b	2m	3 : 2	× *For 2m, correct ratio given in the form n : 1 or 1 : n* eg • 1.5 : 1 • 1 : $\frac{2}{3}$
				or 1m	Gives the ratio 3 : 2 but includes words, letters or symbols eg ■ 3 grey : 2 black ■ $g = 3 : b = 2$ or Shows a correct ratio even if not in its simplest form, or there is incorrect further working eg ■ 60 : 40 ■ 6 : 4 ■ 1.5 : 1 ■ 1 : $\frac{2}{3}$ or Gives the ratio 2 : 3	! *For 1m, incorrect use of percentage sign* Condone only within the ratio 3 : 2, ie for 1m accept 3% : 2%

Tier & Question				Shadows		
		6			Correct response	Additional guidance
				2m	4.2 or equivalent	
				or		
				1m	Shows the value $\frac{2}{3}$ or $\frac{3}{2}$ or equivalents or Shows or implies a complete correct method with not more than one computational or rounding error eg ▪ 1.8 ÷ 2.7 × 6.3 ▪ 1.8 ÷ 2.7 = *0.6 (rounding error)* 0.6 × 6.3 = 3.78 ▪ 6.3 ÷ 2.7 = *2.3 (rounding error)* 1.8 × 2.3 = 4.14	**!** ***For 1m, value rounded*** For $\frac{2}{3}$, accept 0.66(…) or 0.67

1.5 Arithmetiques operations, order of operations

Tier & Question					Getting There	
1					**Correct response**	**Additional guidance**
a	a			**1m**	**64** and **864** **675**	
b	b			**1m**	**2520** **15**	

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

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

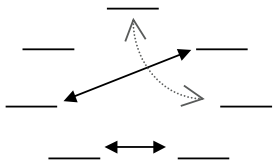
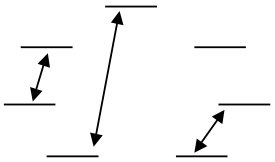
Tier & Question				Calculations		
4					Correct response	Additional guidance
a				1m	72	
b				1m	22	
c				1m	97	
				1m	26	
				1m	1256	
				1m	4348	

2 Algebra

2.1 Expressions, equations and simple functions

Tier & Question				Cooking		
1					**Correct response**	**Additional guidance**
a	a			**1m**	**51**	✓ *Correct answer in hours and minutes* eg, for part (b) • 4 hours 5 minutes ! *Incorrect conversion to hours and minutes* If the correct number of minutes is shown, ignore any further working.
b	b			**1m**	**245**	
c	c			**2m** *or* **1m**	**56** Shows either 39 or 95	

Tier & Question				Mints		
2					**Correct response**	**Additional guidance**
a	a			**2m** *or* **1m**	**5*y* + 6** and **6 + 5*y***, in either order Only one of the correct expressions given; the other incorrect or omitted.	
b	b			**1m**	Indicates **Yes**, and gives a correct explanation eg ■ If you take away the 6, then it is divisible by 5 ■ Could be 10 in a packet. ■ 5 × 10 + 6	✓ *Definitive statement* eg • There must be 10 mints in a packet.

Tier & Question				Algebra Pairs		
3					Correct response	Additional guidance
		a		**2m**	Both pairs correct, and no incorrect, ie 	
				or **1m**	At least one correct pair identified, with not more than one incorrect pair.	
		b		**3m**	All three pairs correct, and no incorrect, ie 	
				or **2m**	At least two correct pairs, and not more than one incorrect pair.	
				or **1m**	At least one correct pair, and not more than two incorrect pairs.	

Tier & Question				Wind chill		
4					Correct response	Additional guidance
				1m	–19	! *Incorrect notation for negative numbers* eg • 19– Penalise only the first occurrence
				1m	16	× *–16 given for 16*
				1m	–22	

Tier & Question						Solving
3-5	4-6	5-7	6-8			
21	16	9	1		Correct response	Additional guidance
				1m	2	! *Throughout the question, incorrect notation* eg, as an answer for the first mark ◆ $k = \times 2$ Withhold one mark only for the first occurrence
				1m	$2\frac{1}{2}$ or equivalent	
				2m	$4\frac{1}{2}$ or equivalent	
				or **1m**	Shows or implies a correct first step of algebraic manipulation that either reduces the number of terms or collects variables on one side of the equation and numbers on the other eg ■ $2t + 4 = 13$ ■ $3t = t + 9$ ■ $3t - t = 13 - 4$ ■ $2t = 9$	! *Method used is trial and improvement* Note that no partial credit can be given
				1m	-1	

Tier & Question

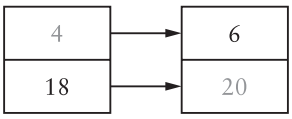
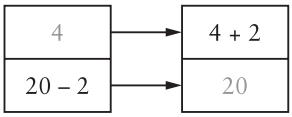
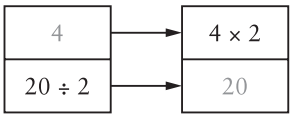
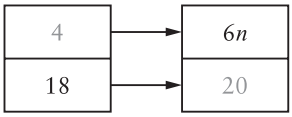
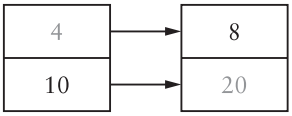
Solving

5		Correct response	Additional guidance
	1m	2	! *Throughout the question, incorrect notation* eg, as an answer for the first mark ◆ $k = \times 2$ Withhold one mark only for the first occurrence
	1m	$2\frac{1}{2}$ or equivalent	

Simplifying

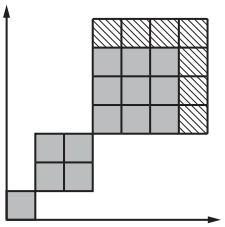
		Correct response	Additional guidance
1m	$8k + 7$	× *Use of multiplication sign in simplified expressions* eg, for the first mark ◆ $8 \times k + 7$
1m	$2k + 5$	× *Partially simplified expressions*

Tier & Question				Magic square		
		6			Correct response	Additional guidance
a	a	a		**2m**	Gives all six correct values, ie 13 12 5 2 10 18 15 8 7 ***or*** **1m** Gives at least three correct values	✗ *Incomplete processing*
b	b	b		**2m**	Gives all three correct values, ie $a = 16$, $b = 4$, $c = 9$ ***or*** **1m** Gives the correct value for b or the correct value for c	

Tier & Question				Functions	
	7			Correct response	Additional guidance
	a	a	a	**1m** Gives both correct values, ie 	✓ *Incomplete processing* eg, for part (a) ◆  eg, for part (b) ◆  ✗ *Incorrect notation* eg, for part (a) ◆ 
	b	b	b	**1m** Gives both correct values, ie 	
	c	c	c	**2m** Gives two different correct functions Examples of correct functions are shown below eg ■ $\frac{n}{5}$ ■ $\sqrt{n}$ ■ $n - 20$ ■ $\frac{n-10}{3}$ ***or*** **1m** Gives one correct function U1	! *Unconventional notation for* $\sqrt{n}$ eg ◆ $n\sqrt{}$ Condone ! $n \rightarrow 5$ Accept as a correct function, provided nothing that could be an incorrect operation is shown eg, do not accept ◆ $n \rightarrow +5$ ✗ *For 2m, same functions written with different symbols or same functions but unsimplified* eg ◆ $\frac{n}{5}$ and $n \div 5$ ◆ $\frac{n}{5}$ and $n \times 0.2$ ◆ $n - 20$ and $n - 10 + 30$

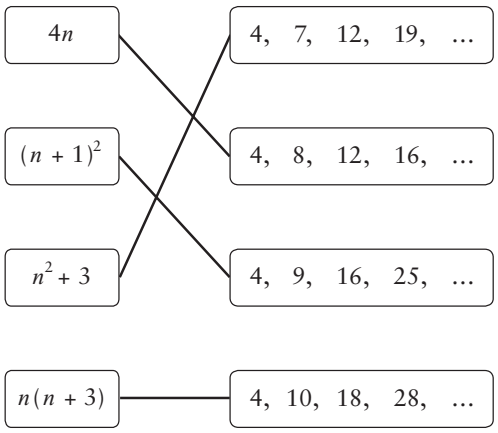
2.2 Sequences and inequalities

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

Tier & Question				Patterns on a grid		
2					Correct response	Additional guidance
a	a			**1m**	Gives the correct coordinates, ie (2, 1)	
b	b			**1m**	Gives both pairs of coordinates in either order eg ■ (3, 3) (4, 4)	
c	c			**1m**	Gives both pairs of coordinates in either order eg ■ (16, 16) (17, 17)	
d	d			**2m**	Makes a correct decision and gives a correct explanation that shows or implies 14 and justifies that 16 more are needed eg ■ Yes, $1^2 + 2^2 + 3^2 + 4^2 = 30$ ■ There are enough because 1 + 4 + 9 = 14, 4 × 4 = 16 and 14 + 16 = 30 ■ The next square is 16 tiles (4 by 4 square drawn) and you've used up 14 of them, so there's just enough ■ You have 16 tiles left and 4 × 4 = 16; all the tiles are used	! *16 not justified* Accept only if the response makes it clear that exactly 30 tiles are used eg, for 2m accept ◆ Used 14, got another 16 so you will use up all the 30 tiles ◆ 30 – 14 = 16, so yes you have exactly the correct amount eg, for 2m or 1m, do not accept ◆ 14 used, 16 left so yes you can ◆ 30 – 14 = 16, so yes you have enough
				or **1m**	States or implies that the next square uses 16 tiles eg ■ You need 16 to make the next square ■ Draws a 4 by 4 square with 16 cells ■ 4 × 4 seen or States or implies that exactly 30 tiles will be used, but does not justify that 16 more are needed eg ■ You need all 30 ■ There would be no tiles left over ■ It all adds up to 30 or Identifies the pattern of differences eg ■ +3, +5, +7	! *4 by 4 square drawn correctly, but the number of squares incorrectly processed* For 1m, condone × *Their explanation could imply that 7 more squares are needed, ie a total of 21* eg ◆  so yes, there are enough
				U1		

Tier & Question				Sequences		
			3		Correct response	Additional guidance
		a	a	**1m**	28	
		b	b	**2m**	Gives all three correct terms in any order eg ▪ $-1, 0, \frac{1}{9}$	! *First two terms shown as fractions* eg, for the first term ◆ $\frac{-1}{1}$ eg, for the second term ◆ $\frac{0}{4}$ For 2m, accept provided there is no further incorrect processing ! *For 2m or 1m, $\frac{1}{9}$ rounded* Accept 0.11 or better Do not accept 0.1 unless a correct method or a more accurate value is seen
				or **1m**	Gives any two correct terms or Shows or implies correct substitution and interpretation of the 'squared' for all three terms, even if there is further incorrect processing eg ▪ $\frac{1-2}{1\times 1}, \frac{2-2}{2\times 2}, \frac{3-2}{3\times 3}$ ▪ $-\frac{1}{1}$ = *1 (error)* $\frac{0}{4}$ = *4 (error)* $\frac{1}{9}$ = *0.9 (error)*	

Tier & Question				Hexagon patterns		
		4			Correct response	Additional guidance
				2m	61	× *For 2m or 1m, incorrect notation* eg, for 2m • 61*n*
				or **1m**	Shows the value 21 or 40, with no evidence of an incorrect method or a method using counting on for the value or Shows a correct method for both types of tile with not more than one computational error eg ■ 20 + 1, 20 × 2 ■ 20 × 3 + 1 or Shows a correct expression for the total number of hexagons, in which the terms in *n* have been collected together eg ■ 3*n* + 1 ■ *n* × 3 + 1	× *For 1m, method shown uses counting on*

Tier & Question				Sequences		
		5			Correct response	Additional guidance
		a	a	**2m**	Matches all four *n*th term rules correctly, ie  	! ***Rule matched to more than one sequence*** For 2m or 1m, do not accept as a correct match
				or		
				1m	Matches at least two *n*th term rules correctly	
		b	b	**2m**	4, 11, 30 and 67, in the correct order	
				or		
				1m	Gives at least two of the four correct terms, even if their positions are incorrect or Shows the values 1, 8, 27 and 64 or Shows a complete correct method for all four terms provided the 'cubed' has been interpreted, even if there is further incorrect working eg ▪ 1 × 1 × 1 + 3 2 × 2 × 2 + 3 3 × 3 × 3 + 3 4 × 4 × 4 + 3	

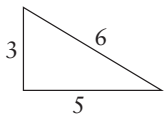
Tier & Question				Triangular numbers		
	6				Correct response	Additional guidance
	a	a	a	**1m**	55	
	b	b	b	**1m**	5050	

Tier & Question				Circle graph		
			7		Correct response	Additional guidance
			a	**2m**	Completes both pairs of coordinates correctly, ie (3, 4) and (3, –4), in either order	
				or		
				1m	Completes either pair of coordinates correctly or Shows the value 16 or Shows or implies a correct method for finding the value of y eg ▪ $y^2 = 25 - 3^2$	
			b	**1m**	5	× *–5 or ± 5*
			c	**2m**	Gives P as (3.5, 3.5)	! *For 2m, gives P as (–3.5, –3.5)* Condone × *For 2m, equivalent fractions or decimals*
				or		
				1m	Shows the value 3.5(…) or 12.5 or equivalent or Shows or implies a correct method for finding the value of x or y eg ▪ $2y^2 = 25$ ▪ $x^2 = 25 \div 2$	

2.3 Formulae and substitution

Tier & Question				Medicine	
	1			Correct response	Additional guidance
	a	a	**2m**	Indicates a correct value, with appropriate units, with a correct method shown eg ■ 80 ÷ 16, 5ml ■ $\frac{20 \times 4}{12 + 4}$, 0.005 litres	✗ *For 2m, incorrect or incomplete method* eg ◆ 20 ÷ 4 = 5ml
			or **1m**	The only error is to omit units or to give incorrect units or Units of ml are given and the method shows or implies correct substitution and understanding of algebraic notation for both multiplication and division eg ■ 20 × 4 ÷ 16, answer 50ml ■ 20 × 4 = *100 (error)*, 12 + 4 = 16 100 ÷ 16 = 6.25ml ■ $\frac{20 \times 4}{12 + 4} = \frac{8}{16}$ (*error* in numerator) = 0.5ml ■ Answer of 10.6(...)ml or 10.7ml or 11ml (only error is to omit necessary brackets when processing) or An answer of 5ml, or equivalent, is given with no working	! ***Units other than ml are given*** Accept provided the pupil shows such a change is intended and the change has been carried out correctly eg, accept ◆ 20 × 4 ÷ 16 = 50, answer 0.05 litres

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

Tier & Question				Heron of Alexandria		
			3		Correct response	Additional guidance
				2m	$\sqrt{56}$, $2\sqrt{14}$, 7.48(…) or 7.5, with no evidence of an incorrect method	✓ *Equivalent fractions or decimals* ! *For 2m, answer of 7* Do not accept unless a correct method or a more accurate value is seen ✗ *Incorrect method* eg ◆ $3 \times 5 \div 2 = 7.5$ ◆ 
				or **1m**	Shows or implies at least two of the following three correct steps 1. Shows or implies that the value of s is 7 2. Substitutes correctly the values of a, b and c and their s into the expression $s(s-a)(s-b)(s-c)$ 3. Takes the square root of the correct result of their substitution eg ■ 56 seen [step 3 omitted] ■ $7(7-3)(7-5)(7-6)$ [step 3 omitted] ■ $\sqrt{7 \times 4 \times 2 \times 2}$ *(error)* = 10.5(…) or 10.6 [step 2 incorrect] ■ $\sqrt{14(14-3)(14-5)(14-6)} = 105.(…)$ [step 1 incorrect] ■ 7.4 [correct value truncated] or Shows the value 51, 51.3(…) or 51.4 [the only error is to use s as 11] or Shows the value 21, 21.1(…) or 21.2 [the only error is to take the square root of 7 before multiplying by 4 and 2]	

Tier & Question					Bowl	
			4		Correct response	Additional guidance
			a	**1m**	Shows or implies correct substitution into the formula with correct evaluation of at least the part in brackets eg ■ Value between 1134 and 1147 inclusive ■ 1150 ■ 365π ■ $\frac{1}{3} \times \pi \times 5 \times 219$ ■ $5.2(\ldots) \times 219$	! *For the first mark, value(s) rounded* For $\frac{1}{3}$, accept 0.33 or better For π, accept 3.14 or 3.142 or better eg, for the first mark accept ◆ $0.33 \times 3.14 \times 5 \times 219$ ◆ $5.1(\ldots) \times 219$
				1m	Shows the correct value for the volume of the bowl to 3 significant figures, ie 1150	! *For the second mark, follow through from an incorrect volume or incorrect working* Accept provided their volume is greater than 1000, and needs rounding to be given correct to 3 significant figures eg, from their volume as 1031.(…) or working of $4.71(\ldots) \times 219$ accept ◆ 1030 eg, from their volume as 1030 with no working, do not accept ◆ 1030
			b	**1m**	Gives a correct formula eg ■ $\frac{1}{3}\pi a^2 h$ ■ $\frac{\pi h a^2}{3}$	! *Unconventional notation* Condone eg, accept ◆ $\pi \times h \times a \times a \div 3$ × *Formula not completely simplified* eg ◆ $\frac{\pi h a^3}{3a}$ × *Incorrect name for variable within the context of the question* eg ◆ $\frac{1}{3}\pi r^2 h$

2.4 Graphs

Tier & Question				Straight lines	
	1			Correct response	Additional guidance
	a	a	a	**1m** Completes the table with any three sets of correct coordinates, indicating for each that $x + y = 4$ eg ▪ <table><tr><td>(x, y)</td><td>(0, 4)</td><td>(1, 3)</td><td>(2, 2)</td></tr><tr><td>$x + y$</td><td>4</td><td>4</td><td>4</td></tr></table>	✓ ***Incomplete processing*** eg, for (1, 3) • 1 + 3 ! ***Values for (x, y) correct but some or all of values for x + y omitted*** Accept provided a correct equation is given in part (b)
	b	b	b	**1m** Gives a correct equation eg ▪ $x + y = 4$ ▪ $y = 4 - x$ ▪ $x = -y + 4$	
	c	c	c	**1m** Draws the correct straight line through (0, 6) and (6, 0)	! ***Line not ruled or accurate*** Accept provided the pupil's intention is clear ! ***Partial line drawn*** Do not accept lines that are less than 5cm in length ! ***Points plotted*** Ignore × ***Points not joined***

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

Tier & Question				Which graph?		
			3		Correct response	Additional guidance
			a	**1m**	Indicates graph D	
			b	**1m**	Indicates graph C	
			c	**1m**	Indicates graph B	

3 Geometry

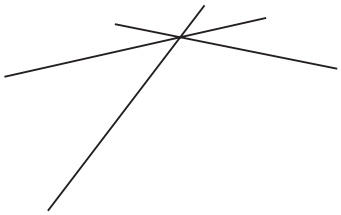
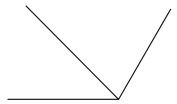
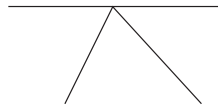
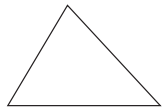
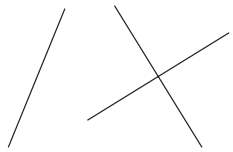
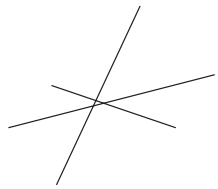
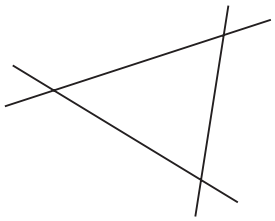
3.1 Geometric reasoning, measurements and construction

Tier & Question					Perimeter and area	
1					Correct response	Additional guidance
a	a			1m	Indicates No and gives a correct explanation The most common correct explanations:	! *Units given* Ignore
					Quantify the areas eg ■ The area of the hexagon is 6 but the triangle is only 4 ■ The hexagon has two more triangles	✓ *Minimally acceptable explanation* eg ◆ 6 and 4 ◆ 2 more × *Incomplete or incorrect explanation* eg ◆ The hexagon is 6 ◆ The hexagon has 5 triangles, the triangle has 4 ◆ The hexagon has one more shape in it than the triangle
					Interpret 'area' eg ■ Different amount of space inside ■ Different numbers of triangles	✓ *Minimally acceptable explanation* eg ◆ Count the triangles ◆ They have different numbers of shapes ◆ One has less triangles ! *Inaccurate description of shapes in an otherwise correct explanation* Condone eg, accept ◆ They have a different number of squares inside × *Incomplete explanation that does not interpret area* eg ◆ Different sizes ◆ Different numbers of dots ◆ Different
					Identify which shape has the bigger area eg ■ The area of the hexagon is greater ■ The triangle has a smaller area	✓ *Minimally acceptable explanation* eg ◆ The hexagon is bigger ◆ The triangle is smaller ◆ The triangle has only 4
				(U1)		

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

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

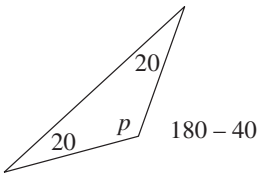
Tier & Question				Explaining why	
3				Correct response	Additional guidance
				1m Indicates AD and CD are both 12, and justifies that triangle ACD is equilateral eg ■ The sides are the same length ■ All sides are 12 ■ AC = AD = CD U1	✓ *Minimally acceptable justification* eg ◆ Sides are the same ◆ They are equal ✗ *Incorrect justification* eg ◆ The sides are even ! *Reference to angles* Ignore, ie do not accept a justification based on angles alone and do not penalise incorrect information about angles given alongside a correct response
				1m Indicates angle y is 60 and gives a correct justification either as a calculation or as a known fact eg ■ $180 \div 3$ ■ $60 \times 3 = 180$ ■ That's how many degrees there are in one angle in an equilateral triangle U1	✓ *Minimally acceptable justification* eg ◆ 60×3 ◆ $60 + 60 + 60$ ◆ All the angles are the same ✗ *Incomplete justification* eg ◆ Angles in a triangle add up to 180 ! *Incorrect notation* Ignore for both this mark and the next eg, for angle y as 60, accept ◆ 60°C
				1m Indicates angle x is 30 and gives a correct justification eg ■ Triangle ADB is a reflection of triangle ABC so x is half y ■ All angles in an equilateral triangle are 60° The reflection shows half so it must be 30° ■ Angles in ABC add up to 180, and $180 - 90 - 60 = 30$ U1	✓ *Minimally acceptable justification* eg ◆ x is half y ◆ $2x = y$ ◆ $60 \div 2$ ◆ It is half ◆ $180 - 90 - 60$! *Follow through* Accept for angle x as their $y \div 2$ provided it is accompanied by a correct justification that either does not use a value for y or uses their value for y, and provided their y is not 0, 90 or greater than or equal to 180

Tier & Question				Points of intersection		
4					**Correct response**	**Additional guidance**
a	a	a		**1m**	Draws three straight lines intersecting at one point eg ▪ 	! ***Ruler not used*** Condone, provided the pupil's intention is clear ✓ ***Lines meet rather than intersect*** eg, for part (a) ◆  ◆  eg, for part (b) in tiers 3–5 and 4–6 ◆  ! ***Diagrams for parts (a) and (b) in tiers 3–5 and 4–6 transposed but otherwise correct*** Mark as 0; 1 ! ***Other diagrams shown*** Ignore, as these may be working for the last part of the question × ***Diagram is ambiguous*** The drawing must clearly show the correct number of points of intersection eg, for part (b) in tiers 3–5 and 4–6 do not accept ◆  ◆ 
b	b			**1m**	Draws three straight lines intersecting at three different points eg ▪ 	

Tier & Question				Points of intersection (cont)		
4					Correct response	Additional guidance
c	c	b		1m U1	Parallel	! *Words used to describe parallel* Accept if applicable to all sets of parallel lines eg • Never meeting • At the same angle • In the same direction • Not touching each other Do not accept if applicable to only some eg • Vertical • Horizontal × *Incomplete response describing parallel* eg • Like railway tracks • Apart

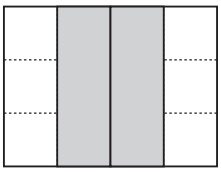
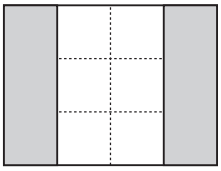
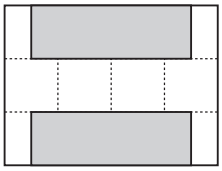
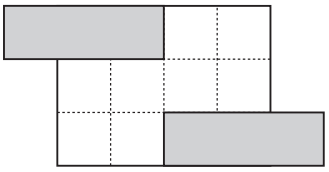
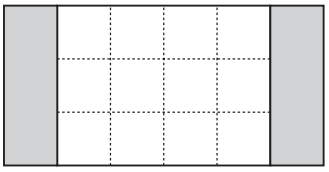
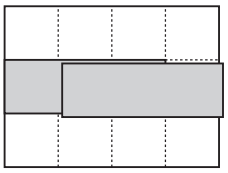
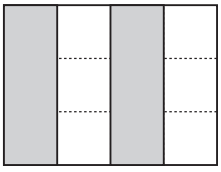
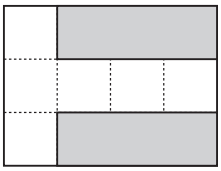
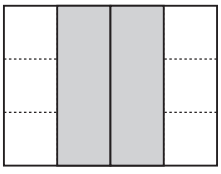
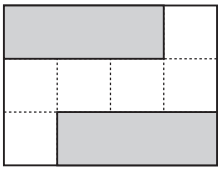
Angles

					Correct response	Additional guidance
a	a	a		**1m** U1	Indicates No and gives a correct explanation that shows the angle sum is incorrect eg ■ 30 + 60 + 100 = 190 but it should sum to 180 ■ They should add to 180 but these add to 190 ■ 30 + 60 + 100 is 10 degrees too big	✓ ***Minimally acceptable explanation*** Accept responses that state the angles should not add to 190, or that the angles should add to 180 eg ◆ They add to 190 which is wrong ◆ Angles in a triangle add up to 180 ◆ The angles don't make 180 ◆ They should add to 180 × ***Incomplete or incorrect explanation*** eg ◆ The angles add to 190 ◆ When you add up the angles you get the wrong angle sum ◆ Angles add to *200* (*error*) not 180 ! ***Incorrect units*** Ignore eg, accept within a correct explanation ◆ 180°C
b	b	b		**2m** ***or*** **1m**	130 Shows or implies a correct method with not more than one computational error eg ■ 360 − (70 + 70 + 90) ■ 360 − 230 ■ 2 × 70 + 90 = *200* (*error*), 360 − 200 = 160 ■ 70 + 70 = 140, 140 + 90 = *330* (*error*), answer 30 ■ 180 − *50*	

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

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

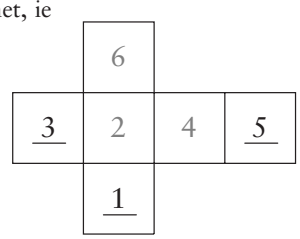
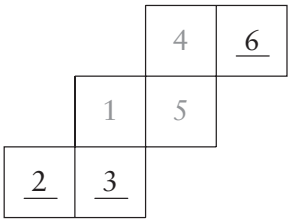
3.2 Transformation, congruency symmerties and properties of 2D shapes

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

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

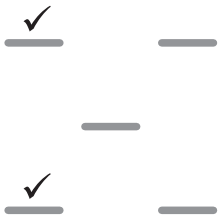
Tier & Question				Star shapes		
			4		Correct response	Additional guidance
			a	**1m**	8	! *Units given* Condone responses of 8cm only
			b	**1m**	Gives a different pair of dimensions in the ratio 5 : 2 or 2 : 5 eg ■ 2 and 5 (either order) ■ 10 and 25 (either order) ■ 1 and 2.5 (either order) ■ 12 and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

Tier & Question				*Marking overlay available*	**Enlargement**	
	5				**Correct response**	**Additional guidance**
				2m	Draws the correct enlargement with vertices within the tolerances as shown on the overlay	! *Lines not ruled or accurate* Accept provided the pupil's intention is clear ! *Construction lines shown* Ignore
				or **1m**	Within an otherwise correct enlargement, the only error is that the vertices are not correctly joined or Their enlargement is the correct size and orientation as shown by the overlay, with vertices joined correctly, but is in the incorrect position	× *Enlargement is the correct size but in an incorrect orientation*

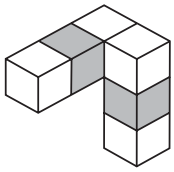
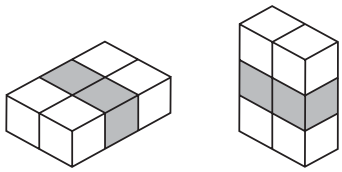
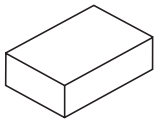
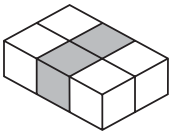
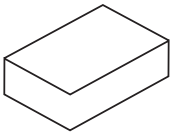
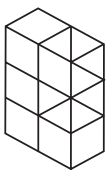
Tier & Question				Dice	
	6			Correct response	Additional guidance
			1m	Gives all three numbers correctly for the first net, ie 	
			1m	Gives all three numbers correctly for the second net, ie 	

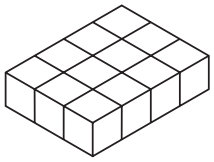
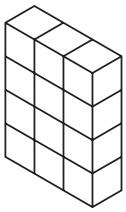
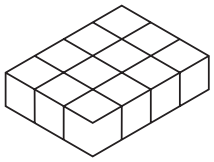
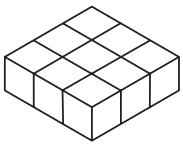
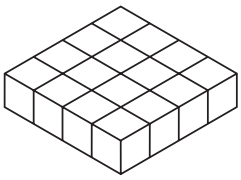
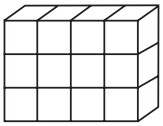
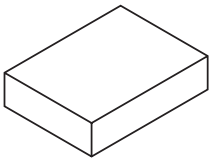
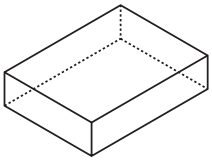
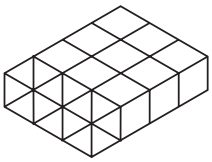
3.3 Nets, symmeries and drawings of 3D shapes

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

Tier & Question					Six cubes	
	3				Correct response	Additional guidance
				1m	Indicates both correct shapes, ie 	✓ *Unambiguous indication*

Tier & Question				Nets		
			3		Correct response	Additional guidance
	a	a	a	**1m**	Shows that the surface areas are different The most common correct explanations: Calculate A as 38, B as 32 eg ■ A is 4 × 8 + 6 = 38, B is 3 × 8 + 8 = 32 State that the difference is 6 eg ■ A has 6 more squares than B Manipulate the nets to a form where comparison may be drawn without further computation eg ■ A is 6 × 8 − 10 but B would be 6 × 8 − 16	✓ *Minimally acceptable explanation* eg ◆ 38, 32 ◆ 4 × 8 + 6 isn't the same as 3 × 8 + 8 ◆ 6 more × *Incomplete explanation* eg ◆ I counted the squares ◆ There are more squares in A than in B ! *Units given* Ignore eg, accept ◆ 38^2cm, 32^2
	b	b	b	**2m** *or* **1m**	Shows that the volume of A is equal to that of B eg ■ <table><tr><th></th><th>length</th><th>width</th><th>height</th><th>volume</th></tr><tr><td>A:</td><td>4</td><td>3</td><td>1</td><td>12</td></tr><tr><td>B:</td><td>3</td><td>2</td><td>2</td><td>12</td></tr></table> ■ A is 3 × 4 × 1 = 12, B is 2 × 3 × 2 = 12 ■ 3 × 4 × 1 = 2 × 3 × 2 ■ A is one layer of 12 cubes and B is two layers of 6 cubes Shows the value 12, with no evidence of an incorrect method for this value	✓ *Minimally acceptable explanation* eg ◆ Both 12 ◆ 12, 12 × *Incomplete explanation* eg ◆ Both the same ! *Units given* Ignore ! *Responses to parts (a) and (b) transposed but otherwise correct* Mark part (a) as 0 but mark part (b) as 1, 0

Tier & Question				Shape rotation	
4				Correct response	Additional guidance
a	a		**1m**	Indicates the correct four faces eg ▪ 	✓ *Unambiguous indication* eg ◆ Grey faces labelled G
b	b		**2m**	Draws a correct view of the cuboid in either of the orientations below, using the isometric grid 	✓ *Incorrect or no shading* ✓ *For 2m, internal lines omitted* eg ◆  ! *Lines not ruled or accurate* Accept provided the pupil's intention is clear
			or **1m**	The only error is to draw the cuboid in the wrong orientation eg ▪  or The only error is to omit some external lines or to show some hidden lines eg ▪  ▪ 	! *Cuboid enlarged* For 2m or 1m, accept provided a consistent scale factor has been used for all lengths × *Shape is not a cuboid*

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

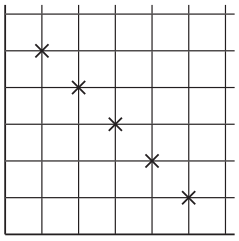
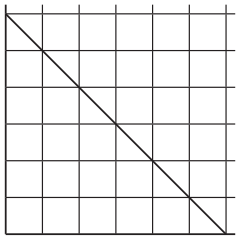
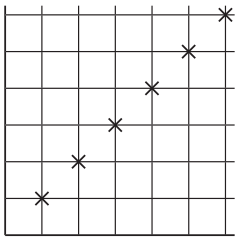
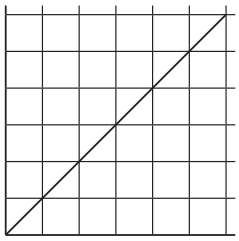
3.4 Bearings, scale drawings and loci

Tier & Question					Map	
1					Correct response	Additional guidance
a				1m	5	
b				1m	West	✓ *Abbreviations* eg • W • NE
				1m	North-east	✓ *Bearings* eg, for W • 270 eg, for NE • 045 • 45 ✓ *Unconventional but unambiguous notation* eg, for North-east • East North
c				1m	4	

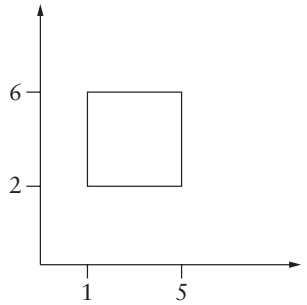
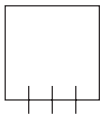
Tier & Question					*Marking overlay available* Ferry	
		2			Correct response	Additional guidance
a	a			2m	The line representing the ferry crossing, within the tolerances shown by the overlay.	✓ *Line(s) not ruled but within tolerance* ! *Pupil draws their own base line* Accept for 2m provided the base line is the correct length within the tolerance shown. If the base line length is incorrect but the angles are correct, mark as 1, 0
				or 1m	One angle drawn within the tolerance shown by the overlay, and at least of length as shown by the overlay, even if their angle does not start at the end of the given line.	
b	b			1m	Their length ± 2mm (Note that the calculated value is 5.59)	! *Rounded to the nearest integer* Accept if their measurement is within 2mm of an integer length, otherwise do not accept.
c	c			2m	Correct response using their (b) or their length eg ▪ Their (b) × 20 and metres given. ▪ Their (b) × 2000 and cm given.	
				or 1m	Their part (b), or their length, multiplied by either 20 or 2000, even if the units are incorrect or omitted.	
					or	
					Shows a correct method with consistent units eg ▪ × 20 seen, and metres given. ▪ × 2000 seen, and centimetres given.	✗ *Correct units with no length*

Tier & Question				*Marking overlay available*	**Fence plan**	
		4			**Correct response**	**Additional guidance**
				2m	Completes the perpendicular bisector, fulfilling the four conditions below: 1. Ruled 2. Within the tolerance as shown on the overlay 3. Touching or crossing both roads 4. Evidence of correct construction arcs that are centred on A and B, are of equal radii, and show at least one intersection	! ***Use of construction arcs on the overlay*** Note that these are to give a visual guide as to whether the correct centres have been used, and do not indicate tolerance × ***Spurious construction arcs*** Do not accept arcs drawn without compasses or arcs that do not show a distinct intersection, eg arcs that just touch ! ***Perpendicular bisector is not a solid line*** Condone provided the pupil's intention is clear
				or		
				1m	Completes the perpendicular bisector with all of conditions 1 to 3 fulfilled or Fulfils condition 4, even if the perpendicular bisector is incorrect or omitted	

3.5 Coordinates

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

Tier & Question				Throwing dice (cont)		
1					Correct response	Additional guidance
c	c			**1m**	Completes the sentence to give a correct rule eg ■ One less than the number on the red dice ■ Red – 1 ■ Needing 1 added to get the number on the red dice	✓ *Minimally acceptable rule* eg ◆ 1 below the other dice ◆ The number below the red dice ✓ *Rule expressed algebraically* eg ◆ $b = r - 1$ ◆ $r - 1$! *Rule that does not use the given starting phrase* Accept only if unambiguous eg, accept ◆ Red = blue + 1 eg, do not accept ◆ 1 more on the red × *Ambiguous rule* eg ◆ – 1 ◆ 1 below ◆ A number below the red dice ◆ The number lower than the red dice ◆ Followed by the number on the red dice × *Incomplete rule* eg ◆ Less than the number on the red dice × *Rule not generalised* Do not accept rules only shown through particular numerical examples eg ◆ 2 – 1 = 1, 3 – 2 = 1, 4 – 3 = 1 etc

Tier & Question					Coordinates	
2					Correct response	Additional guidance
				2m	Gives A as (3, 4)	
				or		
				1m	Gives A as (4, 3) or Shows or implies that the side length of the square is 4 eg ▪ $5 - 1 = 4$ ▪ (5, 2) seen ▪ (1, 6) seen ▪  ▪ 1, 2, (3), 4, 5 2, 3, (4), 5, 6 ▪ 
				(U1)		

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

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

4 Measure

4.1 Length, mass, capacity and reading scales

Tier & Question				Ruler		
1					**Correct response**	**Additional guidance**
a				**1m**	**1.5**	✓ *Equivalent fractions or decimals, or use of words*
				1m	5	✗ *Distance in mm without units specified*
b				**2m**	Indicates **4.5** and **11.5**	✓ *Accuracy within ± 2mm*
				or **1m**	One correct or Scale misread but arrows placed symmetrically about point E	

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

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

4.2 Time, compound measures, speed and motion

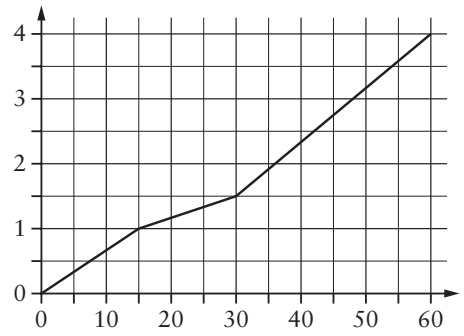
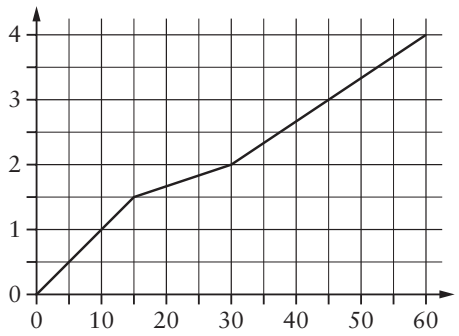
Tier & Question					Time	
1					Correct response	Additional guidance
a				1m	7:55	
b				1m	33	
c				1m	14:20	

Tier & Question					Calendar	
2					Correct response	Additional guidance
a				1m	Tuesday	✓ *Unambiguous abbreviation* eg • Tues • Tu ✗ *Ambiguous abbreviation that could refer to Thursday* eg • T
b				1m	30 (th)	✓ *Unambiguous indication* eg • Marking of diagram.
c				1m	122	

Tier & Question					Birthdays	
3					Correct response	Additional guidance
a	a			1m	21	
b	b			1m	1989 or 89	! *Follow through as 2010 – (a)* Accept provided their (a) > 12 and is not a multiple of 10
c	c			1m	1995 or 95	✓ *Follow through as part (b) + 6* ✓ *Correct birth date or month given* eg • 15.3.95 • March 95

Tier & Question					Clock	
4					**Correct response**	**Additional guidance**
a				**1m**	Indicates only the two correct clocks eg ▪ ✓ .... ✓	**!** ***Indication other than ticks*** eg • ✖ used Accept provided unambiguous
b				**1m**	5:15 or 05:15	✓ ***Superfluous indication of morning*** eg • 5:15 am ✖ ***Time incorrect*** eg • 5:15 pm • 17:15
c				**1m**	17:15	**!** ***Follow through*** Accept follow through as 12 hours later than their (b), even if their (b) was 17:15, provided this is written as a possible time eg, from part (b) as 03:26, accept • 15:26 ✓ ***Superfluous indication of evening*** eg • 17:15 pm ✖ ***Time incorrect or not using 24 hour clock*** eg • 17:15 am • 5:15 pm

Tier & Question				*Marking overlay available*	**Speed**	
	4				**Correct response**	**Additional guidance**
	a	a	a	**1m**	Draws a straight line on the graph joining the points (0, 0) and (60, 30) within the tolerance as shown on the overlay (ie within 2mm), and labels the line 30 km/hour	✓ ***Unambiguous labelling*** eg, for 30 km/hour • 30 ! ***Labels omitted or incorrect*** For two correct lines of full length with labels omitted, mark as 0, 1 Do not accept incorrect labels ! ***Lines not of full length*** For two correct lines at least 5cm long but not of full length, mark as 0, 1 Do not accept lines less than 5cm long
	b	b	b	**1m**	Draws a straight line on the graph joining the points (0, 0) and (30, 60) within the tolerance as shown on the overlay (ie within 2mm), and labels the line 120 km/hour	

Tier & Question				Journeys	
	5			Correct response	Additional guidance
		a	a	**1m** Gives all four names in the correct order, ie Chris Dee Ann Ben	✓ *Unambiguous indication* eg • C D A B
		b	b	**2m** Joins the points (0, 0), (15, 1), (30, 1.5) and (60, 4) with straight lines, ie  *or* **1m** Indicates at least two of the points (15, 1), (30, 1.5) and (60, 4) on the graph, even if they are not joined or are joined incorrectly or Shows or implies all three sets of coordinates (15, 1), (30, 1.5) and (60, 4) in working, even if the graph is incorrect or omitted	! *Lines not ruled or accurate* Accept provided the pupil's intention is clear ! *For 1m, follow-through from their (15, 1) with an incorrect y-value* For an incorrect y-value between 0.5 and 3 inclusive, accept their (30, 1.5) as (30, their incorrect y-value + 0.5) eg, for 1m accept • 
		c	c	**1m** *5*	! *Follow-through from their graph in part (b)* Provided their line for the final section of the graph has a positive gradient and passes through (60, 4), accept follow-through as 2 × (4 – their y-coordinate for (30, 1.5))

4.3 Circles, perimeter, area and volume

Tier & Question				Areas		
1					**Correct response**	**Additional guidance**
a	a	a		**1m**	All correct, ie ✓ – ✓ ✓	
b	b	b		**2m** ***or*** **1m**	**40** Shows the value 10 or Follows through from an incorrect side length to find the perimeter, provided the side length is not 25 eg ▪ Side is 8, so perimeter is 32	

Tier & Question					Sizing	
			2		Correct response	Additional guidance
				2m	Gives the correct order of A, C, B accompanied by one of the following explanations, whether stated or implied:	! *Correct order given in unconventional way* Accept provided it is unambiguous eg, accept • Area, perimeter, side length
					Side lengths of A and C are 6 (or $\sqrt{36}$) and 9 (or $36 \div 4$) respectively	✓ *For 2m or 1m, side length of A implied by 6×6 seen*
					Area of C is 81 (or 9×9)	! *For 2m or 1m, incorrect working or incorrect units alongside a correct response* Ignore
					Perimeter of A is 24 (or 6×4)	! *Their explanation does not explicitly state which property and/or square is being considered* Accept provided the explanation links the relevant values to 36 and accompanies the correct ordering eg, for side lengths of A and C for 2m accept • Area 36 so 6 perimeter 36 so 9, A, C, B • $36 = 6 \times 6$ $36 = 9 + 9 + 9 + 9$ A, C, B for 1m accept • $36 = 6 \times 6$ A, C, B However, as many of the relevant values can be obtained from incorrect reasoning, do not accept only values 6 and 9 seen
				or		
				1m	Gives one of the correct explanations as above, but does not order or orders incorrectly or Gives the correct ordering but justifies only with reference to the side length of A as 6 (or $\sqrt{36}$) or Gives the correct ordering but justifies only with reference to the side length of C as 9 (or $36 \div 4$) or Shows both that the area of B is 1296 (or 36×36) and the perimeter of B is 144 (or 36×4)	
				(U1)		

Tier & Question					Cotton reel	
	4				Correct response	Additional guidance
	a	a	a	**1m**	3π or 9.4 or 9.42(...) or 9.43 with no evidence of an incorrect method	! *Answer of 9* Accept provided a correct method or a more accurate value is seen
	b	b	b	**2m**	970	! *Follow through from part (a)* For 2m, accept 9100 ÷ their (a), rounded correctly to the nearest ten, provided 9100 ÷ their (a) is not a multiple of 10 eg, from their (a) as 7.8, accept for 2m • 1170 eg, from their (a) as 7, do not accept for 2m • 1300
				or **1m**	Shows or implies that the total length should be divided by the circumference, even if the units are incorrect or there are rounding or truncation errors eg ■ 9100 ÷ 9.42 ■ 91 ÷ 3π ■ Digits 96(...) or 97(...) seen	✓ ***For 1m, follow through from part (a), even if their (a) is rounded or truncated before being used*** eg, from their (a) as 7.8, accept • 9100 ÷ 8

Tier & Question						Circle graph	
3-5	4-6	5-7	6-8				
			20			Correct response	Additional guidance
			a	**2m**		Completes both pairs of coordinates correctly, ie (3, 4) and (3, –4), in either order	
				or			
				1m		Completes either pair of coordinates correctly or Shows the value 16 or Shows or implies a correct method for finding the value of y eg ▪ $y^2 = 25 - 3^2$	
			b	**1m**		5	× ***–5 or ± 5***
			c	**2m**		Gives P as (3.5, 3.5)	! ***For 2m, gives P as (–3.5, –3.5)*** Condone × ***For 2m, equivalent fractions or decimals***
				or			
				1m		Shows the value 3.5(…) or 12.5 or equivalent or Shows or implies a correct method for finding the value of x or y eg ▪ $2y^2 = 25$ ▪ $x^2 = 25 \div 2$	

5 Handling Data

5.1 Planning, collecting and displaying data

Tier & Question				Swimming		
1					**Correct response**	**Additional guidance**
a	a	a		**1m**	**48** and **72**	✓ *No values within the table but correct points plotted on the graph*
b	b	b		**2m** *or* **1m**	3 or 4 points plotted correctly ± 1mm, and joined with the correct ruled straight line. 3 or 4 points plotted correctly ± 1mm, but not joined. or 3 or 4 points plotted correctly ± 1mm, but joined incorrectly or line not ruled.	! *Line ruled but does not pass exactly through the correct points* Accept provided the pupil's intention is clear. ! *Bar chart drawn* Ignore bars. ✓ *For 1m, follow through from part (a)*
c	c	c		**1m**	**50** and **64**	✓ *No values within the table but correct points plotted on the graph*
d	d	d		**2m** *or* **1m**	3 or 4 points plotted correctly ± 1mm, and joined with the correct ruled straight line. 3 or 4 points plotted correctly ± 1mm, but not joined. or 3 or 4 points plotted correctly ± 1mm, but joined incorrectly or line not ruled.	! *Line not ruled* Accept if this error has already been penalised in part (b). ! *Line does not pass exactly through the correct points* Accept provided the pupil's intention is clear. ! *Bar chart drawn* Ignore bars. ✓ *For 1m, follow through from part (c)*
e	e	e		**1m**	**22**	✓ *Follow through their graph, including non-integer values, even if rounded to the nearest integer* ! *Their graph shows more than one intersection* All such values must be listed. ! *Cost shown* Ignore.

Tier & Question				Pictogram		
2					Correct response	Additional guidance
a				**1m**	Draws two circles	✓ *Circles not shaded* ! *Circles inaccurate in size and/or shape* Accept provided the pupil's intention is clear
b				**1m**	2	

Tier & Question						Data collection
3					Correct response	Additional guidance
a	a	a		1m U1	Indicates 1 or 2 and gives a correct explanation eg, for 1 ▪ It will take a lot of time to write the name every time ▪ You won't have time to put the whole name ▪ It will not tell you straightaway how many of each type there are ▪ It will just give a long list of words ▪ It would take ages to count up all the trees at the end ▪ You could easily miscount the totals ▪ It's hard to draw a graph from it ▪ It will take up a lot of paper eg, for 2 ▪ It will not tell you straightaway how many of each type there are ▪ It will just give a long list of letters ▪ It would take ages to count up all the trees at the end ▪ You could easily miscount the totals ▪ It's hard to draw a graph from it ▪ It will take up a lot of paper ▪ Some names of trees might start with the same letter ▪ You might not have a code for the type of tree you see	✓ *Minimally acceptable explanation for 1 or 2* eg ◆ Too long ◆ Not efficient ◆ It does not tell you how many there are ! *Explanation for 1 or 2 that refers to an improvement to the design* Accept provided the improvement relates to one of the correct explanations eg, for 1, accept ◆ It's quicker to write only the first letter eg, for 1 or 2, accept ◆ Using a tally chart tells you how many there are eg, for 1 or 2, do not accept ◆ Using a tally chart is better × *Explanation for 1 or 2 that refers to pupils not knowing what type the trees are* eg ◆ They might not know the trees' names × *Explanation for 2 that refers to use of codes* eg ◆ They might find the codes confusing ◆ They could forget the key ◆ It does not list the actual names
b	b	b		1m U1	Indicates 3 and gives a correct explanation eg ▪ It is quick to do a tally chart ▪ Tally marks are easy to write ▪ It's easy to see the number of each type ▪ It shows clearly which types are most common ▪ It's easy to see the mode ▪ You can count up the totals quickly ▪ It is less likely you will miscount ▪ It's more likely to be accurate ▪ It's easy to draw a graph from a tally chart ▪ It does not take up much space	✓ *Minimally acceptable explanation* eg ◆ It's quick ◆ It's efficient ◆ You just put a line ◆ It collects the data together ◆ It's easy to understand ◆ It's simple to use ◆ It's organised ◆ It tells you how many there are × *Incomplete explanation* eg ◆ It's easy ◆ It's simple ◆ It's effective ◆ It's clear ◆ It can be understood ◆ It's not confusing ! *Reference to disadvantages of the design* eg ◆ There might be lots of 'Other' and they will not know what type they were ◆ They have to decide in advance which sorts to include Ignore alongside a correct explanation

Tier & Question				Milk	
		4		Correct response	Additional guidance
			1m	Indicates chart 2, 3 or 4 and gives a correct reason The most common correct reasons for chart 2:	
				Refer to the increasing width of the milk bottles as the height increases eg ■ The taller the milk bottle, the wider it is so the bigger ones look much bigger than the smaller ones than they should ■ In a correct bar chart only the height should increase, but here the area increases ■ If you double the amount of milk, the area of the bottle is actually 4 times as big	✓ *Minimally acceptable reason* eg ◆ The one for D looks smaller than it should ◆ The biggest one looks too big ◆ Only the height should change ◆ They are different widths ✗ *Incomplete reason* eg ◆ The bottles are all different sizes
				Refer to the rounded tops of the bottles or the specific problem they cause eg ■ The tops are curved so you can't read off an accurate number of litres ■ You don't know whether to read from the top or middle of the oval tops	✓ *Minimally acceptable reason* eg ◆ The tops are not flat ◆ It's hard to see what the bottles go up to ◆ It's hard to read the number of litres ✗ *Incomplete reason that does not refer to the vertical scale either explicitly or implicitly* eg ◆ It's hard to read the data exactly
				Refer to problems with the way the bottles overlap/touch eg ■ Some of the bottles cover up parts of other bottles, so you can't really see the relative sizes ■ They're overlapping and might be hiding something important ■ The breeds are separate so there should be gaps between the bottles	✓ *Minimally acceptable reason* eg ◆ Bits are hidden so you can't compare ◆ They overlap so you can't see it properly ◆ Different types shouldn't have touching bottles ✗ *Incomplete reason* eg ◆ The bottles overlap ◆ They shouldn't be touching ◆ It's confusing

5.2 Probabililty

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

Tier & Question				Hands		
	2				**Correct response**	**Additional guidance**
	a	a	a	**1m**	$\frac{7}{15}$ or equivalent probability	! *Value rounded or truncated* Accept 0.46(…) or 0.47 or the percentage equivalents Do not accept 0.5 unless a correct method or a more accurate value is seen
	b	b	b	**1m**	$\frac{1}{10}$ or equivalent probability	! *Follow through* Accept follow through from an incorrect total number of pupils seen in part (a), provided their total is not 4, 16 or 27 eg, from $\frac{14}{29}$ for part (a) accept • $\frac{3}{29}$
	c	c	c	**1m**	$\frac{2}{3}$ or equivalent probability	! *Value rounded* Accept 0.66(…) or 0.67 or the percentage equivalents

Tier & Question				Spinning		
	3				**Correct response**	**Additional guidance**
				2m	0.15 or equivalent probability	× *For 2m, incorrect notation* eg • $0.1\frac{1}{2}$ • 0.1.5
				or **1m**	Shows or implies the intention to add the given probabilities, subtract the sum from 1 and then divide by 2, even if there are errors eg ■ 0.1 + 0.6 = 0.7 $\frac{1-0.7}{2}$ ■ 0.3 ÷ 2 ■ $\frac{1.5}{10}$	

Tier & Question				Counter probabilities	
	4			Correct response	Additional guidance
	a	a	a	**2m** Completes the table with the three correct values in the correct positions, ie Colour of counters / Number of counters / Probability Red / 6 / $\frac{2}{5}$ Blue / 3 / $\frac{1}{5}$ Green / 6 / $\frac{2}{5}$ *or* **1m** Gives at least one correct value in the correct position U1	✓ *Equivalent probabilities* × *Incorrect notation* eg • $\frac{1}{2.5}$
	b	b	b	**1m** Indicates that the probability has decreased, ie ☐ ✓ ☐ ☐ U1	

5.3 Statistical calculations

Tier & Question				Shoe sizes		
1					Correct response	Additional guidance
a	a	a		1m	6	
b	b	b		1m U1	2	

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

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

5.4 Interpreting data and graphs

Tier & Question					No. 1 Singles	
1					**Correct response**	**Additional guidance**
a				**1m**	7	
b				**1m**	**Madonna**	
c				**1m**	**6**	
d				**1m**	**Abba** and **Spice Girls**, either order	**!** *Reference to fourth place* Ignore

Tier & Question					Disco Costs	
2					**Correct response**	**Additional guidance**
a	a			**1m**	**£ 4.**(00)	
b	b			**1m**	Correct explanation. The most common correct explanations: Interpret the spreadsheet to explain why there is one charge eg ▪ The hire of the hall is a fixed charge. ▪ You only hire the hall once. ▪ You only hire one hall. Explain the hire is independent of the number of people attending eg ▪ You pay for the hall however many people come. ▪ It is not affected by the other columns.	✓ *Minimally acceptable explanation* eg ◆ It always costs the same to hire the hall. ✓ *Implication that only one hall is available* eg ◆ You use the same hall no matter how many people there are. ◆ The hall is always the same size. ◆ It's the same hall. ✗ *Incomplete explanation that does not interpret the spreadsheet* eg ◆ It's the hire of the hall. ◆ It's always the same.
c	c			**1m**	**19**	! *Money quantified* Ignore
d	d			**1m**	**27**	
e	e			**1m**	**£ 28.50**	

Tier & Question					Tyres	
		3			**Correct response**	**Additional guidance**
		a	a	**1m**	5	
		b	b	**1m**	Gives a value between 3500 and 5500 inclusive	! *Incorrect units inserted* eg ◆ 5000 miles Ignore