

Paper: 1MA1/3H				
Question	Working	Answer	Mark	Notes
6		147	P1	starts process, eg uses $x$ and $x + 7$
<b>Q1</b>			P1	starts to work with at least 6 correct sides, may be on the diagram or in an expression
			P1	(dep on previous P1) gives a correct expression for the perimeter, eg $x + x + 7 + x + 7 + x + 7 + x + x + 7 + x + 7 + x + 7$ or adds at least 6 correct sides and equates to 70
			A1	for width = 3.5 oe <b>and</b> length = 10.5 oe
			B1	ft (dep P2) for correct area for their $x$

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Question	Answer	Mark	Mark scheme	Additional guidance
8	216	P1	for process to work with ratio eg $72 \div (3 + 4 + 5) (= 6)$ <b>or</b> $72 \div 12 (= 6)$	
<b>Q2</b>		P1	for process to find length of base or height of triangle eg $3 \times "6" (= 18)$ <b>or</b> $4 \times "6" (= 24)$	
			<b>OR</b> process to find area scale factor eg $"6" \times "6" (= 36)$	
		P1	complete process to find the area of the triangle eg $\frac{1}{2} \times "18" \times "24"$ <b>or</b> $\frac{1}{2} \times 3 \times 4 \times "6"{}^2$	
		A1	cao	

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3	Triangle of area 18	M1	for a complete method to find area of trapezium eg $\frac{1}{2}(2 + 7) \times 4 (= 18)$ <b>OR</b> for a triangle drawn of area 36 <b>OR</b> for a triangle that would give an area ft their area of trapezium	The value for the area of the trapezium must be clear for the ft to be checked.
<b>Q3</b>		A1	for a triangle drawn of area 18 eg base = 6, height = 6 or base = 9, height = 4	Accept use of dimensions that are not whole numbers as long as the intention is clear

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7	8.5	P1	for process to use the area of $PQRS$ to find the length of $PQ$ , eg $10y = 45$ <b>or</b> $45 \div 10 (= 4.5)$	Sets up equation for area
Q4		P1	for process to use the perimeter of $ABCD$ , eg $2x + 2 \times "4.5" = 26$ <b>or</b> $26 - 2 \times "4.5" (= 17)$ <b>or</b> $26 \div 2 (= 13)$	Uses perimeter of $ABCD$
		P1	for process to use length of $BC$ to find length of $AB$ , eg solves $2x + 2 \times "4.5" = 26$ <b>or</b> $(26 - 2 \times "4.5") \div 2$ <b>or</b> $"13" - "4.5"$	
		A1	for 8.5 <b>or</b> $8\frac{1}{2}$	Accept $\frac{17}{2}$

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4	(a)	Yes (supported)	<p>P1 for start of process, eg <math>5 \times 9 (= 45)</math> <b>or</b> <math>10 \times 14 (= 140)</math> <b>or</b> <math>5 \times 2 (= 10 \text{ (kg)})</math> <b>or</b> <math>3 \div 2 (= 1.5 \text{ (boxes)})</math></p> <p>P1 for process using ratio of areas, eg “140” <math>\div</math> “45” (= 3.1...) <b>or</b> for using ratio of amount of seed eg “10” <math>\div</math> 3 (= 3.3...) <b>or</b> for finding coverage for 1 kg of grass seed, eg “45” <math>\div</math> 3 (= 15 (m<sup>2</sup>))</p> <p>P1 for process to find amount of seed needed, eg “140” <math>\div</math> “45” <math>\times</math> 3 (= 9.3...kg) <b>or</b> “140” <math>\div</math> “45” <math>\times</math> “1.5” (= 4.6...(boxes)) oe <b>or</b> “15” <math>\times</math> 2 (= 30 (m<sup>2</sup> per box)) <b>and</b> “140” <math>\div</math> “30” (= 4.6...(boxes)) <b>or</b> for process to find area that can be seeded, eg “10” <math>\div</math> 3 <math>\times</math> “45” (= 150 (m<sup>2</sup>)) <b>or</b> “140” <math>\div</math> “10” (= 14 (m<sup>2</sup>)) oe</p> <p>C1 for “Yes” supported by correct figures eg 4.6...(and 5), <b>or</b> 9.3...and 10 <b>or</b> 150 and 140 (or 140 to 148.5) <b>or</b> 15 and 14</p>	<p>Accept values rounded or truncated to 1dp in both (a) and (b). Ignore units</p> <p>Accept 9.4 Accept 4.7</p>
	(b)	Yes, (does not have enough) (supported)	C1	<p>for reasoning supported with correct figures, eg does not have enough seed and compares 9 (kg) with 9.3...(kg) or 4.5 (boxes) with 4.6... (boxes) or 135 (m<sup>2</sup>) with 140 (m<sup>2</sup>) ft from (a)</p>

Q5

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Question	Answer	Mark	Mark scheme		Additional guidance
5	No  (supported)	P1	calculates area of trapezium eg $\frac{1}{2} \times 7 \times (10+16)$ (= 91)		[area of trapezium] needs to be clearly stated if the process of finding the area is not clear
		P1	for division by coverage eg $\div 2$ or [area of trapezium] $\div 2$ (= 45.5) or process to find coverage per tin eg $5 \times 2$ (= 10)	for process to find number of tins bought eg $160 \div 16.99 = 9$ tins	
		P1	for division to find the number of tins eg $\div 5$ or "45.5" $\div 5$ (= 9.1) or [area of trapezium] $\div$ "10" (= 9.1)	for using whole no. of tins to find total litres eg $9 \times 5$ (= 45)	
		P1	(dep on at least P2) for a process to multiply a whole number of tins (rounded up) by 16.99	(dep on at least P2) for a process to find the total coverage eg "45" $\times 2$ (= 90)	
<b>Q6</b>		C1	for 'No' supported by correct figures eg 169.9 or 90 <b>and</b> 91		There must be a conclusion ("No" or equivalent wording) including the figure 169.9 and working showing processes followed.

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14	5	P1	for process to find the area of the triangle, eg. $0.5 \times (x + 4)(x - 2)$ oe OR for process to find the area of rectangle and $27.5 \times 2$ , eg. $(x + 4)(x - 2)$ and 55	Trial and improvement methods must be fully correct identifying the value of $x$ as 7 (3 marks) or the shortest side as 5 (4 marks)
Q7		P1	(dep P1) for process to expand the brackets and derive a quadratic equation, eg. $x^2 + 4x - 2x - 8 = 55$ or $0.5(x^2 + 4x - 2x - 8) = 27.5$ oe	
		P1	(dep P2) for complete process to solve the quadratic equation $x^2 + 2x - 63 = 0$ eg $(x - 7)(x + 9) (= 0)$ or $\frac{-2 \pm \sqrt{2^2 - 4 \times 1 \times -63}}{2 \times 1}$ or $(x + 1)^2 - 1 - 63 (= 0)$	
		A1	cao  SC: B1 for $x^2 + 4x - 2x - 8 = 27.5$	

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Q8	186.15	P1	for correctly finding the area of at least three sections, eg 3 of $11 \times 7 (= 77)$ , <b>or</b> $9 \times 7 (= 63)$ , <b>or</b> $\frac{1}{2} \times 11 \times 9 (= 49.5)$ , <b>or</b> $\frac{1}{4} \times \pi \times 7^2 (= 38.4845..)$	Note a trapezium for the rectangle and triangle should be classed as two areas. Accept figures rounded or truncated to 1 dp or better throughout.  This mark is dependent upon correct processes seen for all four sections.  integer number of bags must come from area $\div$ 14 rounded up
		P1	for a method to find the number of bags required for one area or a combination of areas eg “77” $\div$ 14 (= 5.5) <b>or</b> “227.9845..” $\div$ 14 (= 16.2846...)	
		P1	for method to work out the total area for all four sections eg “77” + “63” + “49.5” + “38.4845...” (= 227.9845...) or adding the exact number of bags per section for all four sections eg “5.5” + “4.5” + “3.53..” + “2.74..” (= 16.28...)	
		P1	for method to find the cost, eg integer number of bags $\times$ 10.95	
		A1	cao	



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4 (a)	19	P1	for process to find area available at festival B, eg $700 \times 2000 (=1\ 400\ 000)$	
		P1	for process to find the area available per person at one festival, eg $80\ 000 \div 425 (= 188.23\dots)$ <b>or</b> [area] $\div 6750 (= 207.40\dots)$	Accept either number rounded eg 207 or 188
		P1	for process to find the area available per person at both festivals, eg $80\ 000 \div 425 (= 188.23\dots)$ <b>and</b> [area] $\div 6750 (= 207.40\dots)$	Accept either number rounded eg 207 or 188
		A1	for an answer in the range 18.7 to 19.5	
Q9 (b)	explanation	C1	for a valid statement relating to scale factor for area, <b>Acceptable examples</b> There are 10000 (cm <sup>2</sup> ) in 1 (m <sup>2</sup> ) Because 1 m <sup>2</sup> is the same as $100 \times 100 = 10000\text{ cm}^2$ There are 2 side lengths that change from 1 m to 100 cm $300 \div 3$ is 100 should use $100^2$ $300 \div 100 \div 100 = 0.03$ $3 \times 100 \times 100 = 30000$ Because it's area not length. Because it's in m <sup>2</sup> not just metres He hasn't taken the squared sign into account <b>Not acceptable examples</b> There are 1000 cm in 1 m Callum is correct because ..... $300 \div 3$ is 100 $3^2 = 9$ $300 \times 300 = 90000$ You have to square the number	

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Q10	Complete chain of reasoning	M1	for (area of trapezium $TQRS = 0.5 \times 4x \times (2x + 3x)$ or for (area of rectangle $TUVS = 4x \times (3x + 5) (= 12x^2 + 20x)$	Evidence for the award of marks may be seen on the diagram  Alternative methods may be seen.  Accept $x$ for $(3x - 2x)$
		M1	for (area of trapezium $QUVR = 4x(3x + 5) - 0.5 \times 4x \times (2x + 3x)$	
		C1	for correct algebraic processing and simplification to the given form	
		M1	<b>Alternative 1</b> for ( $QU = 3x + 5 - 2x (= x + 5)$	
		M1	for (area of trapezium $QUVR = 0.5 \times 4x \times ((x + 5) + 5)$ or $0.5 \times 4x \times (x + 10)$	
		C1	for correct algebraic processing and simplification to the given form	
		M1	<b>Alternative 2</b> for (area of triangle $= 0.5 \times (3x - 2x) \times 4x$ or for (area of rectangle $= 4x \times 5$	
		M1	for (area of trapezium $QUVR = "0.5 \times (3x - 2x) \times 4x" + "4x \times 5"$	
		C1	for correct algebraic processing and simplification to the given form	