Unit 2 Foundation Tier: Number, Algebra, and Geometry 1

5MB2F					
Question		**Working**	**Answer**	**Mark**	**Additional Guidance**
1. **FE**	(a)		Lunar Jim	1	B1 cao
	(b)	20 15 – 19 40 = 20 + 15	35	1	B1 cao
	(c)	20 30 + 45 = 21 00 + 15	21 15	1	B1 cao
					Total for Question: 3 marks
2.	(a)		$5y$	1	B1 for $5y$ or $5 \times y$
	(b)	$x + 2x + 5 - 7$	$3x - 2$	2	B2 cao [B1 for either $3x$ or -2]
					Total for Question: 3 marks
3.	(a)	−11 + 8 OR use a number line and count back Eg: –11 –10 –9 –8 –7 –6 –4 –3 –2 –1 0 1 Count 8 places	−3°C	1	B1 cao
	(b)		2°C	2	M1 for $\frac{-3+7}{2}$ or evidence of a number line from –3 to 7 A1 cao
					Total for Question: 3 marks

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Question		**Working**	**Answer**	**Mark**	**Additional Guidance**
4. **FE**	(a)	200 bags = 40 × 5, cost = £0.85 × 5 = £4.25 or 80 × 2 + 40 × 1, cost = £1.65 × 2 + £0.85 = £3.30 + £0.85 = £4.15 or 160 × 1 + 40 × 1, cost = £3.40 + £0.85 = £4.25 **OR** Using the 80 bag packet is least expensive since: £1.65 < £0.85 × 2 (£1.70) and £1.65× 2 = £3.30 < £3.40 Therefore 2 80 bag packets + 1 40 bag packet will be needed to get the least expensive total cost.	80 × 2 + 40 × 1 is the least expensive	4	B1 for at least 2 alternative ways of getting 200 bags M1 for a correct process to work out the cost of 1 way A1 for the 3 correct total costs C1 for justification that 80 × 2 + 40 × 1 is the least expensive, therefore giving Tommy the greatest change **OR** M1 for comparing the cost of 2 40 bag packets with 1 80 bag packet or 2 80 bag packets with 1 1600 bag packet A1 for correct arithmetic giving accurate costs C1 for justification that using 80 bag packets gives thy least expensive way B1 for 80 bags × 2 + 40 bag × 1
	(b)	57 + 48 × 2 – 125 = 153 – 125 = 28 pkts on shelf 72 – 28 = 44 pkts on shelf at end of day **OR** 57 + 48 + 48 = 105 + 48 = 153 153 – 125 = 28 pkts on shelf 72 – 28 = 44 pkts on shelf at end of day **OR** When there are 72 – 48 = 24 pkts on shelf, a carton can opened. After selling 57 – 24 = 33, 1st carton of 48 is opened to fill the shelf to 72. After selling a further 48, 2nd carton of 48 added. 33 + 48 = 81 pkts sold. 125 – 81 = 44 pkts on shelf at end of day	Not room for the full carton	3	M1 for 57 + 48 × 2 – 125 oe M1 for 72 – "57 + 48 × 2 – 125 " = 44 C1 for justification for opening another carton or not **OR** M1 for a correct process that includes the removing of 125 pkts M1 for calculation leading to the number of spaces remaining at the end of the day C1 for justification for opening another carton or not
					Total for Question: 7 marks

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Question		**Working**	**Answer**	**Mark**	**Additional Guidance**
5.	(a)		Trapezium	1	B1 cao
	(b)		*AC*	1	B1 cao
	(c)		4.5cm or 45mm	1	B1 for B1 cao
	(d)		56.3^{o}	1	B1 for an angle in the range 55 to 58 inc.
					Total for Question: 4 marks
6.			12, 20 and 40	2	B2 cao (– 1 for each extra number given) [B1 for 1 or 2 correct numbers (– 1 for each extra number given)
					Total for Question: 2 marks
7.	(a)		Vertical and horizontal lines of symmetry only	1	B1 cao (– 1 for extra lines drawn)
	(b)		B	1	B1 cao
	(c)		Eg. Equilateral triangle	2	B2 for any shape satisfying both criteria [B1 for a shape with rotation al symmetry of order 3 with no line symmetry]
					Total for Question: 4 marks
8.		Table of values $x = -1 \quad 0 \quad 1 \quad 2 \quad 3$ $y = -4 \quad 1 \quad 6 \quad 11 \quad 16$ **OR** Using $y = mx + c$, gradient = 5, y- intercept = 1	Single line from (– 1, – 4) to (3, 16)	3	B3 for a correct single line from (–1, – 4) to (3, 16) [B2 for at least 3 correct points plotted and joined with line segments **OR** 3 correct points plotted two of which must be the extremes with no joining OR a single line of gradient 5 passing through (0, 1) B1 for 2 correctly plotted points **OR** a single lie of gradient 5 OR a single line passing through (0, 1)
					Total for Question: 3 marks

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Question		**Working**	**Answer**	**Mark**	**Additional Guidance**
9.	(a)		£1 = 1.15 euros	2	M1 for reading off one of say £10, £20, £50, etc and dividing their result by 10, 20, 50, etc A1 for an answer in the range 1.05 to 1.25 inc.
FE	(b)	From graph, £15 = €17.25 £150000 = €172500 A – yes B - yes C - no **OR** From graph, €15.5 = £13.5, so €155000 = £135000 From graph, €17 = £14.8, so €170000 = £148000 From graph, €20 = £17.4, so €200000 = £174000 **OR** £150000 × "answer to (a)" = €172500 A – yes B - yes C - no Without the use of a calculator, division by "(a)" is not likely	A – yes B - yes or no C - no	3	M1 for a suitable reading from the graph A1 for converting to euros (€172500 ± €2500) C1 for correct comparison to price of the villas **OR** M1 for a suitable reading from the graph for the price of one of the villas A1 for converting to pounds (±£2000) C1 for correct comparison to price of the villas for their 'correct' conversions **OR** M1 for £150000 × "answer to (a)" A1 for €172500 ± €2500 C1 for correct comparison to price of the villas
					Total for Question: 5 marks

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Question		Working	Answer	Mark	Additional Guidance
10. **QWC (ii, iii)** **FE**		5% of £600 = 6 × 5 = 30 243 × 30 = 7290 (243 + 64 + 77 + 36) × 18 = 420 × 18 Method 1: 420 × 10 = 4200 420 × 8 = 3360 + 7560 Method 2: × | 400 | 20 10 | 4000 | 200 8 | 3200 | 160 4000 + 200 + 3200 + 160 = 7560 Method 3: 4 2 0 0 4 | 0 2 | 0 0 | 1 3 2 | 1 6 | 0 0 | 8	£18 per member	5	M1 for $\frac{5}{100} \times 600$ or equivalent A1 for 7290 M1 for a complete method, condoning one multiplication error A1 for 7560 C1 for comparing the two results and clearly indicating, with reason, the suggestion which is better. For example, £18 per member raises the most money and the refurbishment is shared by all members [Accept the 5% levy since it raises enough money and the clubhouse is likely to be used more by full members than any other] **QWC: Decision and justification should be clear, with working for 1st and 2nd M1 clearly presented and attributed**
					Total for Question: 5 marks

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Question		**Working**	**Answer**	**Mark**	**Additional Guidance**
11.		$\frac{2^4 \times 2^3}{2^5}$ $\frac{2^4 \times 2^3}{2^5} = \frac{2^{4+3}}{2^5} = 2^{7-5}$ **OR** $\frac{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}{2 \times 2 \times 2 \times 2 \times 2} = 2 \times 2$ **OR** $2^4 = 16$, $2^3 = 8$ SO p = 16 × 8 = 128 $2^5 = 32 = q$ $\frac{p}{q} = 128 \div 32$	2^2 or 4	2	M1 for adding the indices in p and then subtracting the indices in the quotient A1 for 2^2 or 4 **OR** M1 for $\frac{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}{2 \times 2 \times 2 \times 2 \times 2} = 2 \times 2$ with an attempt to cancel A1 for 2^2 or 4 **OR** M1 for 128 and 32 seen A1 for 2^2 or 4
					Total for Question: 2 marks

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Question	**Working**	**Answer**	**Mark**	**Additional Guidance**
12. **QWC (i, ii, iii)** **FE**	330 ÷ 10 = 33 A tiles per long row 40 ÷ 10 = 4 long rows 33 × 4 = 132 tiles 90 ÷ 10 = 9 tiles per short row 30 ÷ 10 = 3 short rows 9 × 3 = 27 tiles 132 + 27 = 159 tiles No of boxes needed = 8 (20 × 8 = 160 tiles) £9.99 × 8 = £79.92 330 ÷ 15 = 22 B tiles per long row 40 ÷ 15 = 3 long rows (1 row of tiles will be cut) 22 × 3 = 66 A tiles 90 ÷ 15 = 6 tiles per short row 30 ÷ 15 = 2 short rows 6 × 2 = 12 tiles 66 + 12 = 78 tiles No of boxes needed = 7 (12 × 7 = 84 tiles) £11.49 × 7 = £80.43 OR Wall area = 330 × 40 + 90 × 30 = 13200 + 2700 = 15900 cm^2 Tile A area = 10 × 10 = 100 cm^2 No of tiles = 15900 ÷ 100 = 159 No of boxes needed = 8 (20 × 8 = 160 tiles) £9.99 × 8 = £79.92 Tile B area = 15 × 15 = 225 cm^2 No of tiles = 15900 ÷ 225 = 70(225 × 70 = 15700) + 1 No of boxes needed = 6 (12 × 6 = 72 tiles) but some tiles will need to be cut, so 7 boxes needed £11.49 × 7 = £80.43	Tile A is the most economical	6	M1 for 330 ÷ 10 or 90 ÷ 10 or 330 ÷ 15 or 90 ÷ 15 A1 for (33 and 9) or (22 and 6) M1 for 33 × 4 + 9 × 3 or 22 × 3 + 6 × 2 A1 ft for 10 A boxes needed ('33 × 4' ÷ '9 × 3') ÷ 20 rounded up to nearest whole number) or for 7A boxes needed ('22 × 3' ÷ '6 × 2') ÷ 12 rounded up to nearest whole number) B1 for answers or £79.92 and £80.43 to justify the choice C1 for comment on the need to cut some Type B tiles **QWC: Decision must be stated, with all calculations attributable** **OR** M1 for either 330 × 40 or 90 × 30 or 10 × 10 or 15 × 15 A1 for 15900 and (100 or 225) M1 for 15900 ÷ 100 or 15900 ÷ 225 A1 ft for 10 A boxes needed ('15900' ÷ '100') ÷ 20 rounded up to nearest whole number) or 7 B boxes needed ('15900' ÷ '225') ÷ 12 rounded up to nearest whole number) B1 for answers or £79.92 and £80.43 to justify the choice C1 for comment on the need to cut some Type B tiles **QWC: Decision must be stated, with all calculations attributable**
				Total for Question: 6 marks

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Question		**Working**	**Answer**	**Mark**	**Additional Guidance**
13.	(a)		$4p(2pq + 3)$	2	B2 for $4p(2pq + 3)$ [B1 for $2p(2pq + 6)$ or $4(p^2q + 3p)$ or $p(4pq + 12)$ or $2(2p^2q + 6p)$]
	(b)	$5 - 2(m - 3) = 5 - 2m + 6$	$11 - 2m$	2	M1 for $5 - 2m + 6$ A1 cao
					Total for Question: 4 marks
14.	(a)		$3n + 2$	2	B2 for $3n + 2$ or equivalent [B1 for $3n + k$ where $k \neq 2$]
	(b)	$3 \times 4^2 + 2 = 3 \times 16 + 2$ $= 48 + 2$	50	2	M1 for $3 \times 4^2 + 2$ with a clear intention to square the 4 independent of the scalar 3 A1 cao
					Total for Question: 4 marks
15. **QWC (i, ii, iii)**		Angle RQT= 100° (alternate angles are equal) Angle TQU = $100 - x$ Angle QUT = $100 - x$ (base angles of isos triangle) Angle QTU = $180 - (100 - x + 100 - x)$ (angles in a triangle)	Proof	5	B1 for angle RQT = 100° B1 for angle TQU = $100 - x$ or angle QUT = $100 - x$ B1 for completing the proof C2 for all 3 reasons given **QWC: Proof should be clearly laid out with technical language correct, eg alternate angles are equal** [C1 for just 1 or 2 reasons given] **QWC: Proof should be clearly laid out with technical language correct, eg alternate angles are equal**
					Total for Question: 5 marks