Mark scheme

Non-Calculator Crossover Paper 2

40 marks · 45 minutes · Non-Calculator

M = method mark A = accuracy mark (depends on M marks) B = independent mark C = communication
ft = follow through cao = correct answer only oe = or equivalent isw = ignore subsequent working

Q	Answer	Mark	Guidance
1(a) N7	5^9	**B1**	cao
1(b)	3^3	**B1**	cao Do not accept 27 on its own.
1(c)	4	**B1**	cao
			Total for Question 1: 3 marks
2 N2 N8	120	**M1** **M1** **A1**	for $\frac{3}{8} \times 240$ (= 90) or $\frac{5}{8} \times 240$ (= 150) for $\frac{1}{5}$ × their 150 (= 30) or $\frac{4}{5}$ × their 150 for 120 $\frac{1}{5}$ of 240 (= 48) used, giving 240 – 90 – 48 = 102, scores M1 M0 A0.
			Total for Question 2: 3 marks
3 R10	Large box (with 48p and 46p per 100 g oe)	**M1** **M1** **C1**	for a correct method to find a comparable value for one box, e.g. 240 ÷ 5 (= 48p per 100 g), or 500 ÷ 240 (= 2.08... g per penny), or 1.5 × 2.40 (= £3.60 for 750 g) for comparable values for both boxes, e.g. 48p and 46p per 100 g, or £3.60 and £3.45 for 750 g, or £4.80 and £4.60 per kg for Large box, supported by correct figures
			Total for Question 3: 3 marks

Q	Answer	Mark	Guidance
4 N4	7:03 pm	**M1** **M1** **A1**	for listing multiples of at least two of 12, 20 and 45 (at least 3 of each), or prime factors of two of the numbers, e.g. $12 = 2^2 \times 3$, $20 = 2^2 \times 5$, $45 = 3^2 \times 5$ for identifying 180 (seconds) or 3 minutes as the LCM for 7:03 pm oe, e.g. 19:03 or 3 minutes past 7 60 (the LCM of 12 and 20 only) leading to 7:01 pm scores M1 M0 A0.
			Total for Question 4: 3 marks
5 A2	57	**M1** **A1**	for correct substitution, e.g. $(-3)^2 - 4 \times (-3) \times 4$, or $9 + 48$ seen for 57 cao $-9 + 48 = 39$ or $9 - 48 = -39$ scores M0 A0 unless correct substitution seen.
			Total for Question 5: 2 marks
6 R11 R1	64	**M1** **M1** **A1**	for a time of 2 hours 15 minutes, 135 minutes, 2.25 hours or $2\frac{1}{4}$ hours for $144 \div 2.25$, or $144 \div 135$ (= 1.066... km per minute) $\times 60$, or $144 \div 9 \times 4$ for 64 $144 \div 2.15$ (= 66.9...) scores M1 M0 A0 if 2 hours 15 minutes is seen, otherwise M0 M0 A0.
			Total for Question 6: 3 marks
7 S4	1.44	**M1** **M1** **A1**	for at least 3 correct products, e.g. 0×6, 1×9, 2×5, 3×3, 4×2 (0, 9, 10, 9, 8) for $(0 + 9 + 10 + 9 + 8) \div 25$, i.e. $36 \div 25$ for 1.44 oe, e.g. $\frac{36}{25}$ or $1\frac{11}{25}$ $36 \div 5$ (= 7.2) scores M1 M0 A0.
			Total for Question 7: 3 marks
8(a) G3	15	**M1** **A1**	for $360 \div 24$ for 15
8(b)	No, with a correct reason	**C1**	for No, with a reason, e.g. the exterior angle would be 50° and $360 \div 50 = 7.2$, which is not a whole number Accept a comparison such as: a regular heptagon has interior angles of 128.6° and a regular octagon has interior angles of 135°, so 130° is not possible.
			Total for Question 8: 3 marks
9(a) A4	p^{12}	**B1**	cao

Q	Answer	Mark	Guidance
9(b)	$3x^4y^2$	**M1** **A1**	for two of the three parts correct in a product, e.g. $3x^4y^3$ or kx^4y^2 for $3x^4y^2$
			Total for Question 9: 3 marks
10 G16	360	**M1** **M1** **A1**	for area of triangle = $\frac{1}{2} \times 8 \times 6$ (= 24) for their 24 × 15 for 360 8 × 6 × 15 (= 720) scores M0 M1 A0. Using 10 cm in the area of the triangle scores M0.
			Total for Question 10: 3 marks
11(a) P6	French only 23, both 5, Spanish only 14, outside 8	**M1** **A1**	for 5 in the intersection, or for 8 outside the circles and two numbers in the circles with a total of 42 for a fully correct Venn diagram
11(b)	$\frac{37}{50}$ (oe, e.g. 0.74)	**M1** **A1**	for 23 + 14 (= 37), ft their Venn diagram for $\frac{37}{50}$ oe ft their Venn diagram for M1 A1 if (a) has 8 outside and the circle totals are 28 and 19.
			Total for Question 11: 4 marks
12(a) A22	$x > 6$	**M1** **A1**	for a correct first step, e.g. $2x - 7 > 5$ or $2x > 12$ for $x > 6$ oe $x = 6$ or 6 on its own scores M1 A0.
12(b)	−2, −1, 0, 1, 2, 3	**M1** **A1**	for $-6 < 2n \leq 6$ or $-3 < n \leq 3$, or for a list with at most one error or omission for −2, −1, 0, 1, 2, 3 and no others
			Total for Question 12: 4 marks
13 A9	$y = -3x + 6$	**M1** **M1** **A1**	for a method to find the gradient, e.g. $\frac{-3-9}{3-(-1)}$ for gradient = −3, or for substituting a point into $y =$ (their m)$x + c$ for $y = -3x + 6$ oe An answer of $-3x + 6$ with no '$y =$' scores M1 M1 A0.
			Total for Question 13: 3 marks