Mark scheme

Non-Calculator Crossover Paper 3

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 N2	£3080	**M1** **M1** **A1**	for a method to find the number of coaches, e.g. 412 ÷ 52 (= 7.9...), or 52 × 8 = 416 (or 52 × 7 = 364) seen for a complete method with a whole number of coaches, e.g. 8 × 385 for 3080 7 × 385 = 2695 scores M1 M1 A0.
			Total for Question 1: 3 marks
2(a) R4 R8	$\frac{4}{9}$	**B1**	for $\frac{4}{9}$ oe $\frac{4}{5}$ scores B0.
2(b)	$\frac{33}{68}$	**M1** **A1**	for 63 ÷ 9 × 4 (= 28) or 63 ÷ 9 × 5 (= 35) for $\frac{33}{68}$ oe
			Total for Question 2: 3 marks
3 N8	£2400	**M1** **M1** **A1**	for $\frac{1}{4} + \frac{2}{5} = \frac{13}{20}$, or $\frac{7}{20}$ seen for 840 ÷ 7 (= 120), or 840 ÷ $\frac{7}{20}$ for 2400
			Total for Question 3: 3 marks
4 R9	£240	**M1** **M1** **A1**	for 100 – 15 = 85 (%) or 0.85 seen for 204 ÷ 85 (= 2.4) × 100 oe, or 204 ÷ 0.85 for 240 204 × 1.15 (= 234.60) scores M0 M0 A0.
			Total for Question 4: 3 marks

Q	Answer	Mark	Guidance
5(a) A25	$4n + 2$	**M1** **A1**	for $4n + k$ where $k \neq 2$, or for 6, 10, 14 with a difference of 4 identified for $4n + 2$ oe
5(b)	No, with a correct reason	**C1**	for No, with a reason, e.g. the number of chairs is always even ($4n + 2$ is even) and 75 is odd, or $4n + 2 = 75$ gives $n = 18.25$, or 18 tables give 74 chairs and 19 tables give 78 chairs ft their linear expression from (a).
			Total for Question 5: 3 marks
6(a) G13	4 cm by 2 cm rectangle with a line dividing it into a 3 by 2 and a 1 by 2 rectangle	**B1** **B1**	for a 4 by 2 rectangle drawn (any orientation) for a fully correct plan, including the internal line 1 cm from one of the 2 cm sides (dividing it into 3 by 2 and 1 by 2) Ignore any other internal lines dividing the plan into squares.
6(b)	L-shape: 4 cm wide, 1 cm high for 3 cm on the left and 3 cm high for 1 cm on the right	**B1**	for a correct front elevation (ignore internal lines) Accept a reflection of the correct shape.
			Total for Question 6: 3 marks
7(a) S6	(15, 36)	**B1**	cao
7(b)	As the number of hours of TV watched increases, the test mark decreases	**B1**	for a correct relationship in context, or for negative correlation
7(c)	23 (accept 20 to 25)	**M1** **A1**	for a single straight line of best fit drawn that ignores the outlier and passes between (2, 35) & (2, 41) and (22, 7) & (22, 13), or a vertical line drawn at 13 hours for an answer in the range 20 to 25
			Total for Question 7: 4 marks
8(a) P6	children 45: popcorn 30, no popcorn 15; adults 75: popcorn 24, no popcorn 51	**B1** **B1** **B1**	for 45 and 75 in the correct boxes for 30 and 15 in the correct boxes for 24 and 51 in the correct boxes (ft their 75)

Q	Answer	Mark	Guidance
8(b)	$\frac{24}{54} = \frac{4}{9}$	M1 A1	for 30 + 24 (= 54), ft their frequency tree for $\frac{24}{54}$ oe, e.g. $\frac{4}{9}$ $\frac{24}{120}$ scores M0 A0.
			Total for Question 8: 5 marks
9(a) N9	0.0073	B1	cao
9(b)	5×10^6	M1 A1	for 0.5×10^7 or 5 000 000 seen for 5×10^6 cao 0.5×10^3 or 5×10^2 (from $10^5 \div 10^2$) scores M0 A0.
			Total for Question 9: 3 marks
10 A19	$x = 2$, $y = 3$	M1 M1 A1	for a correct method to eliminate one variable, e.g. $4x + 6y = 26$ and $15x - 6y = 12$ added ($19x = 38$), condone one arithmetic error for substituting their found value into one of the equations, or for a correct method to eliminate the other variable for $x = 2$ and $y = 3$ Trial and improvement with no correct method seen scores 0 marks unless both values are correct.
			Total for Question 10: 3 marks
11 A18	$x = 6$, $x = -4$	M1 A1 A1	for $(x \pm 6)(x \pm 4)$ for $(x - 6)(x + 4)$ for 6 and -4 Correct answers with no factorisation seen score 0 marks (the question says by factorising).
			Total for Question 11: 3 marks
12(a) A11 A12	(1, −4)	B1	cao
12(b)	−1 and 3	B1	for both −1 and 3
12(c)	−1.45 and 3.45 (see ranges)	M1 A1	for the line $y = 2$ drawn, or for one correct value in range for answers in the ranges −1.55 to −1.35 and 3.35 to 3.55 Exact values are $1 \pm \sqrt{6}$ (−1.449... and 3.449...).
			Total for Question 12: 4 marks