Mark scheme

Non-Calculator Crossover Paper 7

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 N5	SC, SP, SF, MC, MP, MF, GC, GP, GF	**B1** **B1**	for at least 5 correct combinations for all 9 correct combinations with no repeats and no extras Ignore the order within each pair, e.g. CS for SC.
			Total for Question 1: 2 marks
2 A2	38	**M1** **A1**	for a correct substitution, e.g. $3 \times (-4)^2 - 2 \times 5$, or 48 or -10 seen for 38 -58 (from $3 \times -16 - 10$) or 134 (from $(3 \times -4)^2 - 10$) scores M0 A0 unless a correct substitution is seen.
			Total for Question 2: 2 marks
3 R5	60	**M1** **A1**	for $84 \div 7$ (= 12), or $\frac{5}{7} \times 84$ for 60 An answer of 24 (male teachers) scores M1 A0.
			Total for Question 3: 2 marks
4 N4	5	**M1** **A1** **A1**	for listing at least 3 multiples of both 12 and 20, or $12 = 2^2 \times 3$ and $20 = 2^2 \times 5$ for identifying 60 as the LCM for 5 An answer of 3 (packs of rolls) scores M1 A1 A0.
			Total for Question 4: 3 marks
5 R9	£640	**M1** **M1** **A1**	for 35% of 1600 (= 560) or $\frac{1}{4}$ of 1600 (= 400) for $1600 - 560 - 400$, or $100 - 35 - 25$ (= 40%) for 640
			Total for Question 5: 3 marks

Q	Answer	Mark	Guidance
6(a) R14 R11	45 minutes	**B1**	for 45 minutes (accept $\frac{3}{4}$ hour)
6(b)	24	**M1** **A1**	for $18 \div 45$ (minutes), or $18 \div 0.75$, or $18 \times \frac{4}{3}$, or 6 km in 15 minutes for 24 0.4 (km per minute) with no conversion scores M1 A0.
			Total for Question 6: 3 marks
7(a) N9	0.003 08	**B1**	cao
7(b)	4.8×10^6	**M1** **A1**	for 4 500 000 + 300 000 or 4 800 000 seen, or $45 \times 10^5 + 3 \times 10^5$ for 4.8×10^6 7.5×10^6 or 7.5×10^{11} scores M0 A0.
			Total for Question 7: 3 marks
8(a) A4	$5(3x - 4)$	**B1**	cao
8(b)	$(x - 3)(x - 4)$	**M1** **A1**	for $(x \pm 3)(x \pm 4)$ for $(x - 3)(x - 4)$
			Total for Question 8: 3 marks
9 S4	20	**M1** **M1** **A1**	for 4×15 (= 60) for 5×16 (= 80) for 20 An answer of 17 (from adding 1 to the mean) scores 0 marks.
			Total for Question 9: 3 marks
10 G16	£704	**M1** **M1** **A1** **A1**	for splitting into rectangles and finding one correct area, e.g. 12×5 (= 60), 7×4 (= 28), 7×9 (= 63) or 5×5 (= 25), or 12×9 (= 108) for a complete method for the total area, e.g. 60 + 28, 63 + 25 or 108 − 20 for 88 (m^2) for 704 ft their total area × 8 for the final mark only if both M marks have been awarded.
			Total for Question 10: 4 marks

Q	Answer	Mark	Guidance
11 G3	18	**M1** **A1**	for exterior angle = 180 – 160 (= 20), or $(n - 2) \times 180 = 160n$, or 360 ÷ their exterior angle for 18
			Total for Question 11: 2 marks
12 A22	$x \leq 7$	**M1** **A1**	for expanding the bracket and collecting terms correctly, e.g. $2x \leq 14$, or for 7 as a critical value for $x \leq 7$ $x = 7$ or $x < 7$ scores M1 A0.
			Total for Question 12: 2 marks
13(a) P6	Adults 120; children: big wheel 60, not 20; adults: big wheel 36, not 84	**B1** **B1** **B1**	for 120 adults for 60 and 20 for the children for 36 and 84 for the adults (ft their number of adults)
13(b)	$\frac{5}{8}$	**B1**	for $\frac{60}{96}$ oe, e.g. $\frac{5}{8}$ (ft their frequency tree) $\frac{60}{200}$ scores B0.
			Total for Question 13: 4 marks
14(a) A14	0, –4, 5	**B1** **B1**	for at least 2 correct values for all 3 correct: $x = -3$, $y = 0$; $x = -1$, $y = -4$; $x = 2$, $y = 5$
14(b)	Correct smooth U-shaped curve through (–4, 5), (–3, 0), (–2, –3), (–1, –4), (0, –3), (1, 0), (2, 5)	**M1** **A1**	for at least 5 points from their table plotted correctly for a fully correct smooth curve through all 7 points Line segments joining the points score M1 A0.
			Total for Question 14: 4 marks