Mark scheme

Calculator Crossover Paper 7

40 marks · 45 minutes · 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) N6 N7	39.27109239...	**M1** **A1**	for $2.6^4 = 45.6976$ or $\sqrt{41.3} = 6.426...$ for 39.27109239 (accept 39.27109 or better)
1(b)	3.5	**B1**	cao
			Total for Question 1: 3 marks
2 N15	$22.5 \leq m < 23.5$	**B1** **B1**	for 22.5 or 23.5 in a correct inequality, or for 22.5 and 23.5 in an incorrect inequality for $22.5 \leq m < 23.5$
			Total for Question 2: 2 marks
3 S4	1.8	**M1** **M1** **A1**	for at least 3 correct products of visits × frequency, e.g. 23, 62, 48, 32 for their total (165) ÷ 90 for 1.8 (from 1.833...) 165 ÷ 5 = 33 scores M1 M0 A0.
			Total for Question 3: 3 marks
4(a) S1	e.g. people at a football match are likely to watch more sport than other adults	**C1**	for a correct reason, e.g. people at a football match are sports fans so probably watch more sport; adults who do not like sport are not asked; only one place or one time; the first people to leave may be from the same group Do not accept 'the sample is too small' on its own.
4(b)	e.g. choose adults at random from a list of everyone in the town	**C1**	for a correct improvement, e.g. take a random sample of adults from the whole town (e.g. from the electoral register), ask people in different places, ask on different days or at different times, use a larger sample
			Total for Question 4: 2 marks

Q	Answer	Mark	Guidance
5 R9	46.9%	**M1** **M1** **M1** **A1**	for 28 × 6.50 (= 182) or 12 × 3.20 (= 38.40) for total income 182 + 38.40 (= 220.40) for $\frac{220.40 - 150}{150}$ (× 100) or $\frac{220.40}{150}$ (= 1.469...) for 46.9 (accept 46.93) 146.9 scores M1 M1 M1 A0. Using 40 × 3.20 for the rest scores M1 M0 M0 A0 at most.
			Total for Question 5: 4 marks
6 R16	£6106	**M1** **M1** **A1**	for 9400 × 0.82 (= 7708) for their 7708 × 0.89^2 (= 6105.50...) or a complete year-by-year method for 6106 (accept 6105.51) 9400 × 0.82^3 (= 5182.8...) scores M1 M0 A0; 9400 × (1 – 0.18 – 0.11 – 0.11) = 5640 scores M0 M0 A0.
			Total for Question 6: 3 marks
7 R11	2 hours 24 minutes	**M1** **M1** **A1**	for 44.4 ÷ 18.5 for 2.4 hours and 0.4 × 60 (= 24) for 2 hours 24 minutes 2 hours 40 minutes (from 2.4) scores M1 M0 A0.
			Total for Question 7: 3 marks
8(a) A4	$2x - 11$	**M1** **A1**	for $6x - 15$ or $-4x + 4$ seen for $2x - 11$ $2x - 19$ (from $-4x - 4$) scores M1 A0.
8(b)	$(x - 2)(x - 7)$	**M1** **A1**	for $(x \pm 2)(x \pm 7)$ for $(x - 2)(x - 7)$
			Total for Question 8: 4 marks
9(a) P8	0.3 for the first Misses branch; 0.7, 0.3, 0.7, 0.3 on the second kick branches	**B1** **B1**	for 0.3 on the first kick 'Misses' branch for 0.7 and 0.3 correctly placed on both pairs of second kick branches
9(b)	0.91	**M1** **A1**	for 1 – 0.3 × 0.3, or 0.7 × 0.7 + 0.7 × 0.3 + 0.3 × 0.7, ft their tree for 0.91 oe 0.49 (both score) scores M0 A0.
			Total for Question 9: 4 marks

Q	Answer	Mark	Guidance
10 G20	31.1	**M1** **M1** **A1**	for $35.2^2 - 18.9^2$ (= 881.83) for $\sqrt{881.83}$ (= 29.69...) for 31.1 (accept 31.09 to 31.1) 29.7 (not adding 1.4) scores M1 M1 A0.
			Total for Question 10: 3 marks
11(a) G19 R12	12.6	**M1** **A1**	for scale factor $\frac{8.4}{4.8}$ (= 1.75) or 7.2 ÷ 4.8 (= 1.5) for 12.6
11(b)	6.8	**B1**	for 6.8 (from 11.9 ÷ 1.75), ft their scale factor
			Total for Question 11: 3 marks
12(a) A11 A14	1, –2, 1	**B2**	for all three values correct B1 for one or two correct values.
12(b)	Smooth U-shaped curve through the 9 points from the table	**M1** **A1**	for at least 7 points plotted correctly, ft their table for a fully correct smooth curve
12(c)	–0.3 and 1.8	**B1** **B1**	for a value in the range –0.4 to –0.2 for a value in the range 1.7 to 1.9 Exact values are $\frac{3 \pm \sqrt{17}}{4}$ = –0.280... and 1.780... ft their graph.
			Total for Question 12: 6 marks