Mark scheme

Non-Calculator Crossover Paper 5

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	1	**B1**	cao
1(b)	$\frac{1}{25}$	**B1**	for $\frac{1}{25}$ oe, e.g. 0.04
1(c)	–4	**B1**	cao
			Total for Question 1: 3 marks
2 N4	18	**M1** **A1**	for a correct method to find the HCF, e.g. $72 = 2^3 \times 3^2$ and $90 = 2 \times 3^2 \times 5$, or listing factors of both numbers (at least 4 of each, including a common factor greater than 2) for 18 A common factor that is not the highest (e.g. 6 or 9) scores M1 A0.
			Total for Question 2: 2 marks
3(a) S4	$10 < d \leq 20$	**B1**	for $10 < d \leq 20$ (accept 10–20)
3(b)	19 km	**M1** **M1** **A1**	for using midpoints 5, 15, 25, 35 (at least 3 correct) for $\frac{4 \times 5 + 10 \times 15 + 8 \times 25 + 3 \times 35}{25}$ or $\frac{475}{25}$ for 19 Using end points (10, 20, 30, 40) gives 24: award M0 M1 A0. Dividing by 4 scores M1 M0 A0.
			Total for Question 3: 4 marks

Q	Answer	Mark	Guidance
4 G7	Rotation, 90° clockwise, centre (0, –1)	**B1** **B1** **B1**	for rotation for 90° clockwise (accept 270° anticlockwise or –90°) for centre (0, –1) Award no marks if more than one transformation is given.
			Total for Question 4: 3 marks
5 R9	Tuesday club (72% compared with 65%)	**M1** **M1** **C1**	for one correct percentage or equivalent, e.g. $\frac{18}{25}$ = 72% or $\frac{26}{40}$ = 65% for both values in a comparable form, e.g. 72 and 65, or 0.72 and 0.65, or $\frac{144}{200}$ and $\frac{130}{200}$ for Tuesday club with correct supporting values
			Total for Question 5: 3 marks
6(a) A22	$-2 < x \leq 3$	**B1**	for $-2 < x \leq 3$ oe (any letter)
6(b)	Closed circle at –1, open circle at 4, joined by a line	**B1** **B1**	for a closed (filled) circle at –1 and an open circle at 4 for a single line joining –1 to 4 Award B1 only for a fully correct line with one or both circles of the wrong type.
			Total for Question 6: 3 marks
7(a) S1	e.g. She only asks students who travel by bus	**C1**	for a correct reason, e.g. only bus users are asked so students who walk, cycle or come by car are not included; only students who arrive early are asked; the sample is not random Do not accept "the sample is too small".
7(b)	e.g. Choose students at random from a list of every student in the school	**C1**	for a correct improvement, e.g. take a random sample from a whole-school list, or ask students from every year group as they arrive by any method of travel "Ask more people" on its own scores C0.
			Total for Question 7: 2 marks
8(a) P6	Piano only 19, both 4, Guitar only 11, outside 6	**M1** **M1** **A1**	for 6 outside the circles, or 40 – 6 (= 34) seen for 23 + 15 – 34 (= 4) or 4 in the intersection for a fully correct Venn diagram: 19, 4, 11 and 6 19 and 11 must be consistent with their intersection for the second M1 to be implied.

Q	Answer	Mark	Guidance
8(b)	$\frac{11}{40}$	B1	for $\frac{11}{40}$ oe (ft their Venn diagram)
			Total for Question 8: 4 marks
9 G1 G3	56°	M1 A1 C1	for angle $BAC = 180 - 112$ (= 68°), or for $2x = 112$ for 56 for appropriate reasons, e.g. angles on a straight line add up to 180°; base angles of an isosceles triangle are equal; angles in a triangle add up to 180° Alternative: exterior angle of a triangle, so $2x = 112$.
			Total for Question 9: 3 marks
10 A21	117 cm^2	M1 M1 A1 A1	for a correct expression for the perimeter, e.g. $2(3x - 2) + 2(x + 4)$ or $8x + 4$ for forming and starting to solve a correct equation, e.g. $8x + 4 = 44$, giving $8x = 40$ for $x = 5$ (or sides 13 cm and 9 cm) for 117 Using $4x + 2 = 44$ (half the perimeter not doubled) gives $x = 10.5$: M0 M1 A0 A0 at most.
			Total for Question 10: 4 marks
11(a) N9	7.2×10^7	B1	cao
11(b)	1.6×10^7	M1 A1	for 16×10^6 or 16 000 000 seen, or 1.6×10^k where $k \neq 7$ for 1.6×10^7 8×10^6 or 4×10^9 scores M0 A0.
			Total for Question 11: 3 marks
12 R5	35	M1 M1 A1	for recognising that 15 counters is the difference of 3 parts, e.g. $7 - 4 = 3$, or forming $4k + 15 = 7k$ for 1 part = 5, or $k = 5$ for 35 An answer of 20 (the number of red counters at the start) scores M1 M1 A0.
			Total for Question 12: 3 marks
13(a) A9	3	B1	cao
13(b)	$y = 3x - 7$	M1 A1	for substituting (4, 5) into $y = 3x + c$, e.g. $5 = 12 + c$, or for $y = 3x + c$ with $c \neq 1$ for $y = 3x - 7$ oe
			Total for Question 13: 3 marks