Mark scheme

Non-Calculator Crossover Paper 4

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 N8	$3\frac{1}{5}$	**M1** **A1**	for $\frac{12}{5} \times \frac{4}{3}$ oe, e.g. $\frac{48}{20} \div \frac{15}{20}$ for $3\frac{1}{5}$ cao $\frac{16}{5}$ or $3\frac{3}{15}$ scores M1 A0.
			Total for Question 1: 2 marks
2(a) S2 S4	29	**B1**	cao
2(b)	33	**B1**	cao
2(c)	$\frac{5}{15}$ (oe, e.g. $\frac{1}{3}$)	**B1**	for $\frac{5}{15}$ oe
			Total for Question 2: 3 marks
3(a) N4	$2^2 \times 3^3$	**M1** **A1**	for at least two correct steps of a factor tree or repeated division for $2^2 \times 3^3$ or $2 \times 2 \times 3 \times 3 \times 3$
3(b)	36	**M1** **A1**	for $72 = 2^3 \times 3^2$, or for listing at least 4 factors of each number, or for a common factor greater than 1 (e.g. 12 or 18) for 36
			Total for Question 3: 4 marks
4 N15	$3.55 \leq L < 3.65$	**B1** **B1**	for 3.55 and 3.65 given as the bounds (in any form) for $3.55 \leq L < 3.65$ cao Accept 3.649... or 3.6499 as the upper bound for B1 only.
			Total for Question 4: 2 marks

Q	Answer	Mark	Guidance
5(a) A4	$x^2 - 5x - 14$	**M1**	for at least 3 correct terms out of 4, e.g. $x^2 + 2x - 7x - 14$
		A1	for $x^2 - 5x - 14$
5(b)	$6y^2 + 11y - 10$	**M1**	for at least 3 correct terms out of 4, e.g. $6y^2 + 15y - 4y - 10$
		A1	for $6y^2 + 11y - 10$
			Total for Question 5: 4 marks
6 P4	32	**M1**	for $1 - (0.35 + 0.25)$ (= 0.4), or for 0.35×80 (= 28) and 0.25×80 (= 20)
		A1	for 32
			Total for Question 6: 2 marks
7 R10	4	**M1**	for 6×15 (= 90) worker-days, or for $15 \div 9$ oe
		M1	for their $90 \div 9$ (= 10), or $6 \times \frac{15}{9}$
		A1	for 4
			An answer of 10 scores M1 M1 A0. Direct proportion ($6 \times 9 \div 15 = 3.6$) scores 0 marks.
			Total for Question 7: 3 marks
8 R11	8.5	**M1**	for volume = $8 \times 2 \times 5$ (= 80)
		M1	for $680 \div$ their 80
		A1	for 8.5 oe, e.g. $8\frac{1}{2}$
			$80 \div 680$ scores M1 M0 A0.
			Total for Question 8: 3 marks
9 G16	12	**M1**	for area of trapezium = $\frac{1}{2} \times (7 + 13) \times 6$ oe
		M1	for their $60 \div 5$
		A1	for 12
			$7 \times 13 \times 6$ or $(7 + 13) \times 6$ (= 120) for the area scores M0 M1 A0.
			Total for Question 9: 3 marks
10 A5	$k = \frac{P - 3m}{4}$	**M1**	for a correct first step, e.g. $P - 3m = 4k$ or $\frac{P}{4} = k + \frac{3m}{4}$
		A1	for $k = \frac{P - 3m}{4}$ oe, e.g. $k = \frac{P}{4} - \frac{3m}{4}$
			$\frac{P - 3m}{4}$ written on the answer line is acceptable.
			Total for Question 10: 2 marks

Q	Answer	Mark	Guidance
11 G17	$3\pi + 12$	**M1** **M1** **A1**	for $\pi \times 12$ (= 12π) or $2 \times \pi \times 6$, i.e. the circumference of the full circle for $\frac{1}{4} \times$ their 12π (= 3π) for $3\pi + 12$ oe 3π on its own scores M1 M1 A0. Using $\pi \times 6^2$ (area) scores M0.
			Total for Question 11: 3 marks
12 G3 A21	110°	**M1** **M1** **A1** **A1**	for $2x + x + 30 + 3x - 10 + 100 = 360$ oe for collecting terms correctly, e.g. $6x + 120 = 360$ or $6x = 240$ for $x = 40$ for 110 Setting the sum equal to 180 scores M0 M1 A0 A0 at most. An answer of 40 scores M1 M1 A1 A0.
			Total for Question 12: 4 marks
13(a) A25	-1	**M1** **A1**	for $47 - 3n < 0$ oe, or $n = 16$ identified, or for listing terms to at least the 14th term (5) with at most one error for -1 An answer of 16 (the position) scores M1 A0.
13(b)	5	**M1** **M1** **A1**	for the 3rd and 4th terms in terms of a: $3 + a$ and $3 + 2a$ for $6 + 3a = 21$ oe for 5 A correct answer from trial (e.g. 3, 5, 8, 13, 21) with no algebra scores full marks.
			Total for Question 13: 5 marks