SQ29/N5/01

**Mathematics
Paper 2**

Marking Instructions

These Marking Instructions have been provided to show how SQA would mark this Specimen Question Paper.

✕SQA

Part One: General Marking Principles for National 5 Mathematics

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question. The marking schemes are written to assist in determining the 'minimal acceptable answer' rather than listing every possible correct and incorrect answer.

(a)   Marks for each candidate response must <u>always</u> be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question.

(b)   Marking should always be positive, ie marks should be awarded for what is correct and not deducted for errors or omissions.

(c)   Credit must be assigned in accordance with the specific assessment guidelines.

(d)   Candidates may use any mathematically correct method to answer questions except in cases where a particular method is specified or excluded.

(e)   Working subsequent to an error must be followed through, with possible credit for the subsequent working, provided that the level of difficulty involved is approximately similar. Where, subsequent to an error, the working is easier, candidates lose the opportunity to gain credit.

(f)   Where transcription errors occur, candidates would normally lose the opportunity to gain a processing mark.

(g)   Scored out or erased working which has not been replaced should be marked where still legible. However, if the scored out or erased working has been replaced, only the work which has not been scored out should be judged.

(h)   Unless specifically mentioned in the specific assessment guidelines, do not penalise:

- Working subsequent to a correct answer
- Correct working in the wrong part of a question
- Legitimate variations in solutions
- Bad form
- Repeated error within a question

Part Two: Specific Marking Instructions for each question

Question			Marking scheme Give one mark for each •	Max mark	Illustrations of evidence for awarding a mark at each •
1			Ans: 85·169 miles •^{1} multiplying factor •^{2} power of 3 •^{3} answer	3	•^{1} 1·15 •^{2} $1·15^3$ •^{3} 85·169 or 85·17 or 85·2 or 85
2			Ans: $1·65 \times 10^9$ •^{1} correct method •^{2} answer	2	•^{1} $3 \times 10^5 \times 5·5 \times 1000$ •^{2} $1·65 \times 10^9$
3	a		Ans: $\mathbf{b - a}$ •^{1} answer	1	•^{1} $\mathbf{b - a}$
3	b		Ans: $\mathbf{2(b - a)}$ •^{1} answer	1	•^{1} $\mathbf{2(b - a)}$
4			Ans: -4 •^{1} correct substitution into equation •^{2} state value of k	2	•^{1} $-16 = k \times 2^2$ •^{2} -4
5			Ans: 9·8 cm •^{1} correct application of cosine rule for PR^2 •^{2} correct value for PR^2 •^{3} answer	3	•^{1} $8^2 + 3^2 - 2 \times 8 \times 3 \times \cos120°$ •^{2} 97 •^{3} 9·8(488…..)

6			Ans: 870 cm^3	5		
			$\bullet^1$ know how to calculate volume of toy		$\bullet^1$	add volume of cone and volume of hemisphere
			$\bullet^2$ substitute correctly into formula for volume of hemisphere		$\bullet^2$	$\frac{1}{2}\times\frac{4}{3}\times\pi\times6^3$ $(=452\cdot389...)$
			$\bullet^3$ substitute correctly into formula for volume of cone		$\bullet^3$	$\frac{1}{3}\times\pi\times6^2\times11$ $(=414\cdot690....)$
			$\bullet^4$ calculate volume correctly		$\bullet^4$	$867\cdot079...$
			$\bullet^5$ round to 2 significant figures		$\bullet^5$	870
7			Ans: £387·50	3		
			$\bullet^1$ know that 120% = 465		$\bullet^1$	120% = 465
			$\bullet^2$ know to divide 465 by 1·2		$\bullet^2$	100% = 465 ÷ 1·2
			$\bullet^3$ answer		$\bullet^3$	387·50
8	a		Ans: mean = 21 standard deviation = 2.1	3		
			$\bullet^1$ calculate mean		$\bullet^1$	21
			$\bullet^2$ start to calculate standard deviation		$\bullet^2$	as far as $\Sigma(x-\bar{x})^2=22$ or $\Sigma x^2=2668$
			$\bullet^3$ answer		$\bullet^3$	$2\cdot0976$
8	b		Ans: two valid statements	2		
			$\bullet^1$ compare means		$\bullet^1$	Machine A, on average, packs more sprouts into a bag
			$\bullet^2$ compare standard deviations		$\bullet^2$	The number of sprouts packed in a bag by Machine A is more consistent

9			Ans: 4·1472 litres	3	
			$\bullet^1$ find linear scale factor		$\bullet^1$ $\dfrac{36}{15}$ (= 2·4)
			$\bullet^2$ find volume scale factor		$\bullet^2$ $\left(\dfrac{36}{15}\right)^3$ (= $2\cdot4^3$ = 13·824)
			$\bullet^3$ calculate volume		$\bullet^3$ 4·1 or 4·15 or 4·147 or 4·1472
10	a		Ans: half of [2 − (−4)] graph moved down 1	2	
			$\bullet^1$ correct explanation of 3		$\bullet^1$ half of [2 − (−4)] , or equivalent
			$\bullet^2$ correct explanation of −1		$\bullet^2$ graph of $y = \cos x°$ moved down 1, or equivalent
10	b		Ans: 70·5°, 289·5°	4	
			$\bullet^1$ form equation		$\bullet^1$ $3\cos x° − 1 = 0$
			$\bullet^2$ rearrange equation		$\bullet^2$ as far as $\cos x° = \dfrac{1}{3}$
			$\bullet^3$ find one value		$\bullet^3$ 70·5
			$\bullet^4$ find second value		$\bullet^4$ 289·5
11	a		Ans: 1536 cm^2	3	
			$\bullet^1$ correct fraction of area		$\bullet^1$ $\dfrac{110}{360}$
			$\bullet^2$ correct formula		$\bullet^2$ $\dfrac{110}{360} \times \pi \times 40^2$
			$\bullet^3$ all calculations correct		$\bullet^3$ 1535·8…
11	b		Ans: 175 cm	3	
			$\bullet^1$ correct fraction of circumference		$\bullet^1$ $\dfrac{250}{360}$
			$\bullet^2$ correct formula		$\bullet^2$ $\dfrac{250}{360} \times \pi \times 80$
			$\bullet^3$ all calculations correct		$\bullet^3$ 174·5…

12			Ans: $p > \frac{1}{3}$	4		
			$\bullet^1$ know to use discriminant		$\bullet^1$ $b^2 - 4ac$
			$\bullet^2$ correct values of a, b and c		$\bullet^2$ $a = p$, $b = -2$, $c = 3$
			$\bullet^3$ form correct inequation		$\bullet^3$ $4 - 12p < 0$
			$\bullet^4$ solve inequation		$\bullet^4$ $p > \frac{1}{3}$
13	a		Ans: 29°	4		
			$\bullet^1$ calculate angle CDH		$\bullet^1$ 130°
			$\bullet^2$ correct use of sine rule		$\bullet^2$ $\dfrac{50}{\sin CDH} = \dfrac{79}{\sin 130°}$
			$\bullet^3$ rearrange equation		$\bullet^3$ $\sin CDH = \dfrac{50 \sin 130°}{79}$
			$\bullet^4$ find angle CDH		$\bullet^4$ 29°
13	b		Ans: 249°	2		
			$\bullet^1$ use alternate angle		$\bullet^1$ angle alternate to given bearing = 40°
			$\bullet^2$ find correct bearing		$\bullet^2$ 249°

Total Marks for Paper 2 — 50

[END OF SPECIMEN MARKING INSTRUCTIONS]