N5

SQ29/N5/01

**Mathematics
Paper 1
(Non-Calculator)**

Marking Instructions

✕ 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: $7\frac{3}{5}$ •^{1} start simplification **and** know how to divide fractions •^{2} consistent answer	2	•^{1} $\dfrac{19}{8} \times \dfrac{16}{5}$ •^{2} $7\frac{3}{5}$ or $\frac{38}{5}$
2	Ans: $2x^3 - 5x^2 - 10x + 3$ •^{1} three terms correct •^{2} remaining terms correct •^{3} collect like terms	3	•^{1} eg $2x^3 - 8x^2 + 2x$ •^{2} eg $3x^2 - 12x + 3$ •^{3} $2x^3 - 5x^2 - 10x + 3$
3	Ans: $7\sqrt{2}$ •^{1} add vectors correctly •^{2} find magnitude •^{3} express as surd in simplest form	3	•^{1} $\begin{pmatrix} 9 \\ -1 \\ -4 \end{pmatrix}$ •^{2} $\sqrt{98}$ •^{3} $7\sqrt{2}$
4	Ans: $x = -5, x = 1\cdot5$ •^{1} one correct factor •^{2} correct factorisation •^{3} solve equation	3	•^{1} $x + 5$ or $2x - 3$ •^{2} $(x + 5)(2x - 3)$ •^{3} $x = -5, x = 1\cdot5$

5			Ans: $\dfrac{2\sqrt{6}}{3}$	2	
			$\bullet^1$ know how to rationalise denominator		$\bullet^1$ $\dfrac{4}{\sqrt{6}} \times \dfrac{\sqrt{6}}{\sqrt{6}}$
			$\bullet^2$ consistent answer		$\bullet^2$ $\dfrac{2\sqrt{6}}{3}$
6	a		Ans: $y = 2x + 1$	3	
			$\bullet^1$ find gradient		$\bullet^1$ $m = 2$
			$\bullet^2$ substitute gradient and (11,23) or (17,35) into $y - b = m(x - a)$ or $y = mx + c$		$\bullet^2$ eg $y - 23 = 2(x - 11)$ or $23 = 2 \times 11 + c$
			$\bullet^3$ state equation of line in simplest form		$\bullet^3$ $y = 2x + 1$ or $2x - y + 1 = 0$ or equivalent
6	b		Ans: $2 \times 8 + 1 = 17$	1	
			$\bullet^1$ **use equation** to calculate sports score		$\bullet^1$ $2 \times 8 + 1 = 17$
7	a		Ans: $x^{-1} + x^0$ or equivalent	2	
			$\bullet^1$ multiply $x^{1/2} \times x^{-3/2}$ correctly		$\bullet^1$ x^{-1}
			$\bullet^2$ multiply $x^{1/2} \times x^{-1/2}$ correctly		$\bullet^2$ x^0 or 1
7	b		Ans: $1\frac{1}{6}$	1	
			$\bullet^1$ find exact value of expression		$\bullet^1$ $1\frac{1}{6}$ or $\frac{7}{6}$
8			Ans: $v = \sqrt{\dfrac{2p}{m}}$	3	
			$\bullet^1$ multiply by 2		$\bullet^1$ $mv^2 = 2p$
			$\bullet^2$ divide by m		$\bullet^2$ $v^2 = \dfrac{2p}{m}$
			$\bullet^3$ square root		$\bullet^3$ $v = \sqrt{\dfrac{2p}{m}}$

9	a		Ans: $y = (x-4)^2 + 3$	2		
			$\bullet^1$ p correct		$\bullet^1$ $y = (x-4)^2$	
			$\bullet^2$ q correct		$\bullet^2$ $y = (x-4)^2 + 3$	
9	b		Ans: insert correct diagram	3		
			$\bullet^1$ correct shape and position		$\bullet^1$ parabola with minimum turning point in first quadrant	
			$\bullet^2$ coordinates of y-intercept shown		$\bullet^2$ $(0,19)$	
			$\bullet^3$ coordinates of turning point shown		$\bullet^3$ $(4,3)$	
10	a		Ans: $3f + 4r = 185$	1		
			$\bullet^1$ construct equation		$\bullet^1$ $3f + 4r = 185$	
10	b		Ans: $2f + 3r = 130$	1		
			$\bullet^1$ construct equation		$\bullet^1$ $2f + 3r = 130$	
10	c		Ans: restricted pass costs £20 full pass costs £35	3		
			$\bullet^1$ evidence of scaling		$\bullet^1$ $6f + 8r = 370$ $6f + 9r = 390$	
			$\bullet^2$ calculate r or f		$\bullet^2$ $r = 20$ or $f = 35$	
			$\bullet^3$ communicate answer		$\bullet^3$ restricted pass costs £20 full pass costs £35	
11			Ans: $\dfrac{x-22}{(x+2)(x-4)}$	3		
			$\bullet^1$ correct common denominator		$\bullet^1$ $(x+2)(x-4)$	
			$\bullet^2$ correct numerator		$\bullet^2$ $4(x-4)-3(x+2)$	
			$\bullet^3$ simplify		$\bullet^3$ $\dfrac{x-22}{(x+2)(x-4)}$	

12	a		Ans: $r - 5$	1	
			•^{1} state expression		•^{1} $r - 5$
12	b		Ans: 10·6 cm	3	
			•^{1} correct use of Pythagoras' theorem		•^{1} $r^2 = (r - 5)^2 + 9^2$
			•^{2} expand bracket		•^{2} $r^2 = r^2 - 10r + 25 + 81$
			•^{3} solve equation		•^{3} $r = 10·6$

Total Marks for Paper 1 — 40

[END OF SPECIMEN MARKING INSTRUCTIONS]