N5

National Qualifications
SPECIMEN ONLY

S847/75/01

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

Marking Instructions

These marking instructions have been provided to show how SQA would mark this specimen question paper.

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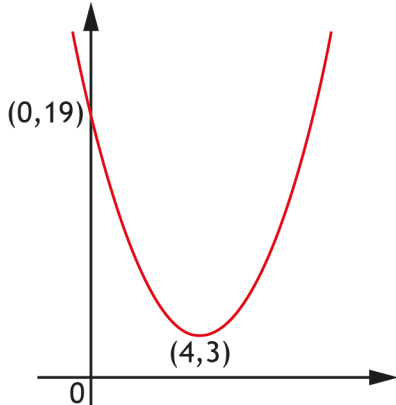
Marking instructions for each question

Question	Generic scheme	Illustrative scheme	Max mark
1	**Ans:** $7\dfrac{3}{5}$ $\bullet^1$ start simplification **and** know how to divide fractions $\bullet^2$ consistent answer in simplest form	$\bullet^1$ $\dfrac{19}{8}\times\dfrac{16}{5}$ $\bullet^2$ $7\dfrac{3}{5}$ or $\dfrac{38}{5}$	2
2	**Ans:** $x > -5$ $\bullet^1$ expand bracket $\bullet^2$ collect like terms $\bullet^3$ solve for x	$\bullet^1$ $11-2-6x < 39$ $\bullet^2$ $-6x < 30$ or $-30 < 6x$ $\bullet^3$ $x > -5$ or $-5 < x$	3
3	**Ans:** $7\sqrt{2}$ $\bullet^1$ add vectors correctly $\bullet^2$ know how to find magnitude $\bullet^3$ find magnitude as a surd in its simplest form	$\bullet^1$ $\begin{pmatrix} 9 \\ -1 \\ -4 \end{pmatrix}$ $\bullet^2$ $\sqrt{9^2+\left(-1\right)^2+\left(-4\right)^2}$ $\bullet^3$ $7\sqrt{2}$	3
4	**Ans:** $a = 5$ $\bullet^1$ know to substitute $\left(-3,\ 45\right)$ into $y = ax^2$ $\bullet^2$ solve equation for a	$\bullet^1$ $45 = a(-3)^2$ or equivalent $\bullet^2$ $a = 5$	2
5	**Ans: two real and distinct roots** $\bullet^1$ find discriminant $\bullet^2$ state nature of roots	$\bullet^1$ $53 \quad [5^2-4\times7\times(-1)]$ $\bullet^2$ two real and distinct roots	2

Question		Generic scheme	Illustrative scheme	Max mark
6	(a)	**Ans:** $W = 20A + 40$ $\bullet^1$ gradient $\bullet^2$ substitute gradient and a point into $y - b = m(x - a)$ or $y = mx + c$ $\bullet^3$ state equation in terms of W and A **and** in simplest form (remove any brackets and collect constants)	$\bullet^1$ $\dfrac{240}{12}$ or equivalent $\bullet^2$ $y - 100 = \dfrac{240}{12}(x - 3)$ or $y - 340 = \dfrac{240}{12}(x - 15)$ or $100 = \dfrac{240}{12} \times 3 + c$ or $340 = \dfrac{240}{12} \times 15 + c$ $\bullet^3$ $W = 20A + 40$ or equivalent	3
6	(b)	**Ans:** $20 \times 12 + 40 = 280\,kg$ $\bullet^1$ calculate weight using equation from part (a)	$\bullet^1$ $20 \times 12 + 40 = 280\,kg$ stated explicitly	1
7	(a)	**Ans: median** $= 19 \cdot 5$, **SIQR** $= 4 \cdot 5$ $\bullet^1$ find median $\bullet^2$ find quartiles $\bullet^3$ calculate semi-interquartile range	$\bullet^1$ $19 \cdot 5$ $\bullet^2$ 17 and 26 $\bullet^3$ $4 \cdot 5$	3
7	(b)	**Ans: valid comments** $\bullet^1$ compare medians $\bullet^2$ compare semi-interquartile ranges	$\bullet^1$ On average the second round's scores are higher $\bullet^2$ The second round's scores are more consistent.	2

Question			Generic scheme	Illustrative scheme	Max mark
8	(a)		**Ans:** $5a + 3c = 158\cdot25$ •¹ construct equation	•¹ $5a + 3c = 158\cdot25$	1
8	(b)		**Ans:** $3a + 2c = 98$ •¹ construct equation	•¹ $3a + 2c = 98$	1
8	(c)		**Ans: Adult ticket costs £22·50** **Child ticket costs £15·25** •¹ evidence of scaling •² follow a valid strategy through to produce values for a and c •³ calculate correct values for a and c •⁴ communicate answers in money	•¹ eg $\begin{array}{l} 10a + 6c = 316\cdot50 \\ 9a + 6c = 294 \end{array}$ •² values for a and c •³ $a = 22\cdot5$ and $c = 15\cdot25$ •⁴ Adult £22·50 Child £15·25	4
9			**Ans: 600000** •¹ know that $80\% = 480000$ •² begin valid strategy •³ answer	•¹ $80\% = 480000$ •² $10\% = 60000$ or equivalent •³ 600000	3
10			**Ans:** $\dfrac{2\sqrt{5}}{5}$ •¹ correct substitution •² correct answer	•¹ $\dfrac{2}{\sqrt{5}}$ •² $\dfrac{2\sqrt{5}}{5}$	2

Question		Generic scheme	Illustrative scheme	Max mark
11	(a)	Ans: $\mathbf{b} - \mathbf{a}$ •¹ correct answer	•¹ $\mathbf{b} - \mathbf{a}$ or $-\mathbf{a} + \mathbf{b}$	1
11	(b)	Ans: $2(\mathbf{b} - \mathbf{a})$ •¹ correct answer	•¹ $2(\mathbf{b} - \mathbf{a})$ or $2(-\mathbf{a} + \mathbf{b})$	1
12		Ans: $a = 4,\ b = 3$ •¹ state the value of a •² state the value of b	•¹ 4 •² 3	2
13	(a)	Ans: $(x - 4)^2 + 3$ •¹ correct bracket with square •² complete process	•¹ $(x - 4)^2$.......... •² $(x - 4)^2 + 3$	2
13	(b)	Ans: •¹ coordinates of turning point correct •² sketch parabola with **minimum** turning point consistent with •¹ •³ y-intercept correct	•¹ $(4, 3)$ •² parabola with **minimum** turning point consistent with •¹ •³ $(0, 19)$	3

Question		Generic scheme	Illustrative scheme	Max mark
14		**Ans:** $\dfrac{x-22}{(x+2)(x-4)}$ $\bullet^1$ correct denominator $\bullet^2$ correct numerator $\bullet^3$ remove brackets and collect like terms in numerator	 $\bullet^1$ $(x+2)(x-4)$ $\bullet^2$ $4(x-4)-3(x+2)$ $\bullet^3$ $\dfrac{x-22}{(x+2)(x-4)}$	3
15		**Ans:** $\sin^2 x°$ $\bullet^1$ identify correct trigonometric identity to be used $\bullet^2$ use correct trigonometric identity to simplify expression	 $\bullet^1$ $\dfrac{\sin x}{\cos x}$ or $\dfrac{\sin^2 x}{\cos^2 x}$ $\bullet^2$ $\dfrac{\sin^2 x}{\cos^2 x} \times \cos^2 x = \sin^2 x$	2
16	(a)	**Ans:** $r-5$ $\bullet^1$ state expression	 $\bullet^1$ $r-5$	1
16	(b)	**Ans:** 10·6 $\bullet^1$ correct use of Pythagoras' Theorem $\bullet^2$ expand bracket $\bullet^3$ solve equation	 $\bullet^1$ $r^2=(r-5)^2+9^2$ $\bullet^2$ $r^2=r^2-10r+25+81$ $\bullet^3$ $r=10·6$	3

[END OF SPECIMEN MARKING INSTRUCTIONS]