



2008 Mathematics

Standard Grade Credit

Finalised Marking Instructions

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Special Instructions

- 1 The main principle in marking scripts is to give credit for the skills which have been demonstrated. Failure to have the correct method may not preclude a pupil gaining credit for the calculations involved or for the communication of the answer.

Care should be taken to ensure that the mark for any question or part question is entered in the correct column, as indicated by the horizontal line.

Where a candidate has scored zero marks for any question attempted, "0" should be shown against the answer in the appropriate column.

It is of great importance that the utmost care should be exercised in adding up the marks. Where appropriate, all summations for totals and grand totals must be carefully checked.

- 2 The answer to one part, correct **or incorrect** must be accepted as a basis for subsequent dependent parts of a question. Full marks in the dependent part is possible if it is of equivalent difficulty.

- 3 Do not penalise insignificant errors. An insignificant error is one which is significantly below the level of attainment being assessed.

eg An error in the calculation of $16 + 15$ would not be penalised at Credit Level.

- 4 Working after a correct answer should **only** be taken into account if it provides **firm** evidence that the requirements of the question have not been met.

- 5 In certain cases an error will ease subsequent working. **Full** credit cannot be given for this subsequent work but **partial** credit may be given.

- 6 Accept answers arrived at by inspection or mentally, where it is possible for the answer to have been so obtained.

- 7 Do not penalise omission or misuse of units unless marks have been specifically allocated to units.

- 8 A wrong answer without working receives no credit unless specifically mentioned in the marking scheme.

The rubric on the outside of the Papers emphasises that working must be shown. In general markers will only be able to give credit to partial answers if working is shown. However there may be a few questions where partially correct answers unsupported by working can still be given some credit. **Any such instances will be stated in the marking scheme.**

- 9 Acceptable alternative methods of solution can only be given the marks specified, ie a more sophisticated method cannot be given more marks.

Note that for some questions a method will be specified.

- 10 In general do not penalise the same error twice in the one question.

- 11 Accept legitimate variations in numerical/algebraic questions.

- 12 Do not penalise bad form eg $\sin x^0 = 0.5 = 30^0$.

- 13 A transcription error is not normally penalised except where the question has been simplified as a result.

2008 Mathematics SG – Credit Level – Paper 1

Marking Instructions

Award marks in whole numbers only

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
1	<p>Ans: 5.8</p> <ul style="list-style-type: none"> • knowing correct order of operations • carrying out both calculations 	<ul style="list-style-type: none"> • must involve a multiplication followed by a subtraction • 5.8 <p style="text-align: right;">2KU</p>
<p>Notes:</p> <p>(i) for 5.8, with or without working award $\frac{2}{2}$</p> <p>(ii) for 722.1, with or without working award $\frac{1}{2}$</p> <p>(iii) for 18.4 $(24.7 - 0.63 \times 10)$, with or without working award $\frac{1}{2}$</p> <p>(iv) for 22.81 $(24.7 - 0.63 \times 3)$, with or without working award $\frac{1}{2}$</p> <p>(v) for 740.37 $(24.7 \times 30 - 0.63)$, with working award $\frac{1}{2}$</p> <p>(vi) for a final answer of 18.9 award $\frac{0}{2}$</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
2	<p>Ans: $5(x - 3)(x + 3)$</p> <ul style="list-style-type: none"> • beginning to factorise • factorised fully 	<ul style="list-style-type: none"> • $5(x^2 - 9)$ • $5(x - 3)(x + 3)$ <p style="text-align: right;">2KU</p>
<p>Notes:</p> <ul style="list-style-type: none"> (i) the 1st mark is available for $5(x^2 - 9)$ or $(5x - 15)(x + 3)$ or $(x - 3)(5x + 15)$ (ii) All 3 factors must be shown together to obtain the 2nd mark 		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
3	<p>Ans: $H = \sqrt{\frac{W}{B}}$</p> <ul style="list-style-type: none"> • beginning to rearrange • completed rearrangement 	<ul style="list-style-type: none"> • $H^2 = \frac{W}{B}$ • $H = \sqrt{\frac{W}{B}}$ <p style="text-align: right;">2KU</p>
<p>Notes:</p> <p>(i) for $H = \sqrt{\frac{W}{B}}$, with or without working award $\frac{2}{2}$</p> <p>(ii) for $H = \frac{\sqrt{W}}{B}$, with or without working award $\frac{1}{2}$</p> <p>(iii) the 2nd mark is for the square root of the candidate's expression for H^2</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
4	<p>Ans: $y = -2x + 18$</p> <ul style="list-style-type: none"> • gradient • y-intercept • linear equation 	<ul style="list-style-type: none"> • -2 • 18 • $y = -2x + 18$ <p style="text-align: right;">3KU</p>
<p>Notes:</p> <p>(i) for $y = -2x + 18$, with or without working award $\frac{3}{3}$</p> <p>(ii) for $y = -2x + c$, with or without working award $\frac{1}{3}$</p> <p>(iii) for $y = mx + 18$, with or without working award $\frac{1}{3}$</p> <p>(iv) for an incorrect equation, the 3rd mark can be awarded only if both gradient and y-intercept are consistent with stated values</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
5	<p>Ans: $\frac{3p+5}{p(p+5)}$</p> <ul style="list-style-type: none"> • common denominator • simplified numerator 	<ul style="list-style-type: none"> • $\frac{\dots}{p(p+5)}$ or $\frac{\dots}{p^2+5p}$ • $\frac{3p+5}{\dots}$ <p style="text-align: right;">2KU</p>
<p>Notes:</p> <p>(i) for wrong simplification beyond the correct answer award $\frac{1}{2}$</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
6 (a)	Ans: $2(x + 8)$ • expression	• $2(x + 8)$ 1KU
(b)	Ans: $0.5x$ • expression	• $0.5x$ 1KU
(c)	Ans: 12 kilometres per hour • equating the two distances • collecting like terms • solution	• $2(x + 8) + 0.5x = 46$ • $2.5x = 30$ • $x = 12$ 3RE
Notes: (i) for answer of 12 km/h without working award $\frac{1}{3}$		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
7 (a)	Ans: 5 • value	• 5 1KU
(b)	Ans: $x + 6$ • expression	• $x + 6$ 1RE
(c)	Ans: $7x + 7$ • dealing with mean • find term	• $\frac{-2x + (x + 5) + 3^{\text{rd}} \text{ term}}{3} = 2x + 4$ • $7x + 7$ 2RE
Notes: (i) for $7x + 7$, with or without working, award $\frac{2}{2}$		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
8 (a)	Ans: (2, 0), (8, 0) <ul style="list-style-type: none"> • coordinates of Q • coordinates of R 	<ul style="list-style-type: none"> • (2, 0) • (8, 0) <p style="text-align: right;">2KU</p>
Notes: <p>(i) for 2 and 8 award $\frac{1}{2}$</p> <p>(ii) for (0, 2) and (0, 8) award $\frac{1}{2}$</p>		
(b)	Ans: 25 units <ul style="list-style-type: none"> • axis of symmetry • finding height above x axis • solution 	<ul style="list-style-type: none"> • $x = 5$ • $y = 9$ • 25 units <p style="text-align: right;">3RE</p>
Notes: <p>(i) for a final answer of 25, with or without working award $\frac{3}{3}$</p> <p>(ii) for a final answer of 9, with or without working award $\frac{2}{3}$</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
9	<p>Ans: $m^{\frac{7}{2}}$</p> <ul style="list-style-type: none"> • correct index • solution 	<ul style="list-style-type: none"> • $m^{\frac{1}{2}}$ • $m^{\frac{7}{2}}$ <p style="text-align: right;">2KU</p>
Notes:		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
10 (a)	Ans: (0,1) <ul style="list-style-type: none"> • coordinates of C 	<ul style="list-style-type: none"> • (0,1) <p style="text-align: right;">1KU</p>
Notes: (i) accept an answer of $(y =) 1$		
(b)	Ans: $a = 4$ <ul style="list-style-type: none"> • method • processing 	<ul style="list-style-type: none"> • $16 = a^2$ • $a = 4$ <p style="text-align: right;">2KU</p>
Notes: (i) for $a = 4$, with or without working <p style="text-align: right;">award $\frac{2}{2}$</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
11	<p>Ans: $3\sqrt{2}$</p> <ul style="list-style-type: none"> • method • solution • simplification of a surd 	<ul style="list-style-type: none"> • $AC^2 + (\sqrt{32})^2 = (\sqrt{50})^2$ • $\sqrt{18}$ • $3\sqrt{2}$ <p style="text-align: right;">3KU</p>
<p>Notes:</p> <p>(i) for a final answer of $\sqrt{82}$ with working award $\frac{1}{3}$</p> <p>(ii) the 3rd mark is available for the simplification of $\sqrt{18}$, $\sqrt{32}$ or $\sqrt{50}$</p> <p>(iii) $\sqrt{18}$ without working cannot be awarded the first 2 marks</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
12	<p>Ans: $a = 5, b = -7$</p> <ul style="list-style-type: none"> • valid strategy • processing • solution 	<ul style="list-style-type: none"> • either $-ax - ax$ or $a^2 + b$ • $a = 5$ • $b = -7$ <p style="text-align: right;">3KU</p>
<p>Notes:</p> <p>(i) for $a = 5$, with or without working, award the first two marks</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
13	<u>algebraic method</u> Ans: $x = -3$ <ul style="list-style-type: none"> • strategy • processing • solution 	<ul style="list-style-type: none"> • $\frac{17+x}{24+x}$ • $\frac{17+x}{24+x} = \frac{2}{3}$ • $x = -3$ <p style="text-align: right;">3RE</p>
	<u>numerical method 1</u> Ans: $x = -3$ <ul style="list-style-type: none"> • strategy • processing • solution 	<ul style="list-style-type: none"> • adding the same number to numerator and denominator • further fractions • $x = -3$ <p style="text-align: right;">3RE</p>
	<u>numerical method 2</u> Ans: $x = -3$ <ul style="list-style-type: none"> • strategy • processing • solution 	<ul style="list-style-type: none"> • listing at least 3 fractions equivalent to $\frac{2}{3}$ • selecting $\frac{14}{21}$ • $x = -3$ <p style="text-align: right;">3RE</p>
Notes: (i) for $x = -3$ without working award $\frac{2}{3}$		

**KU 27 marks
RE 12 marks**

[END OF PAPER 1 MARKING INSTRUCTIONS]

2008 Mathematics SG – Credit Level – Paper 2

Marking Instructions

Award marks in whole numbers only

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
1	<p>Ans: 52 900 tonnes</p> <ul style="list-style-type: none"> • multiplying factor • power of 3 • solution (unrounded) • solution (rounded) 	<ul style="list-style-type: none"> • 1.08 • 1.08^3 • 52 907.90 • 52 900 <p style="text-align: right;">4KU</p>
<p>Notes:</p> <p>(i) for 52 900, with or without working award $\frac{4}{4}$</p> <p>(ii) for 245 000, with or without working ($\times 1.8^3$) award $\frac{3}{4}$</p> <p>(iii) for 32 700, with or without working ($\times 0.92^3$) award $\frac{3}{4}$</p> <p>(iv) for any other final answers, an unrounded solution must be stated to access the 3rd and 4th marks</p> <p>(v) candidates using simple interest may only be awarded the last mark ($(3 \times 3360) + 42\,000 = 52\,080 \rightarrow 52\,100$)</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
2 (a)	Ans: 34, 29 <ul style="list-style-type: none"> • median • mode 	<ul style="list-style-type: none"> • 34 • 29 <p style="text-align: right;">2KU</p>
(b)	Ans: $\frac{11}{30}$ <ul style="list-style-type: none"> • probability 	<ul style="list-style-type: none"> • $\frac{11}{30}$ or equivalent <p style="text-align: right;">1KU</p>
<p>Notes:</p> <p>(i) for median = 29 and mode = 34 award $\frac{1}{2}$</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
3	Ans: £56.25 <ul style="list-style-type: none"> • valid strategy • processing • solution 	<ul style="list-style-type: none"> • $80\% = 45$ • $100\% = \frac{45}{0.8}$ • 56.25 <p style="text-align: right;">3KU</p>
<p>Notes:</p> <p>(i) for £56.25, with or without working award $\frac{3}{3}$</p> <p>(ii) for £37.50 ($120\% = £45$), with working award $\frac{2}{3}$</p> <p>(iii) for £36 (80% of £45), with or without working award $\frac{0}{3}$</p> <p>(iv) for £54 (120% of £45), with or without working award $\frac{0}{3}$</p> <p>(v) Caution: Some candidates state $80\% = 45$ but continue as in notes (iii) or (iv). In these cases, the 1st mark is still available</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
4 (a)	Ans: $x + y = 60$ <ul style="list-style-type: none"> • equation 	<ul style="list-style-type: none"> • $x + y = 60$ <p style="text-align: right;">1KU</p>
(b)	Ans: $50x + 20y = 1740$ <ul style="list-style-type: none"> • equation 	<ul style="list-style-type: none"> • $50x + 20y = 1740$ <p style="text-align: right;">1KU</p>
(c)	Ans: 18 fifty pence coins <ul style="list-style-type: none"> • evidence of scaling • processing • value of x 	<ul style="list-style-type: none"> • $20x + 20y = 1200$ or equivalent • $30x = 540$ or equivalent • 18 <p style="text-align: right;">3RE</p>
Notes: <p>(i) for 18 without working award $\frac{0}{3}$</p> <p>(ii) for 18 and 42 verified in both equations award $\frac{1}{3}$</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
5 (a)	Ans: $\sqrt{65}$ <ul style="list-style-type: none"> • method • solution 	<ul style="list-style-type: none"> • $OP^2 = 8^2 + 1^2$ • $\sqrt{65}$ or 8.06 <p style="text-align: right;">2RE</p>
(b)	Ans: $\sqrt{40}$ <ul style="list-style-type: none"> • method • solution 	<ul style="list-style-type: none"> • $PT^2 = (\sqrt{65})^2 - 5^2$ • $\sqrt{40}$ or 6.32 <p style="text-align: right;">2RE</p>
<p>Notes:</p> <p>(i) the wrong form of Pythagoras should not be penalised in part (b), if already penalised in part (a)</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
6	<p>Ans: no, the boat is not beyond the horizon, with numerical comparison</p> <ul style="list-style-type: none"> • variation statement • variation equation • evaluating k • method to enable comparison • answer and justification 	<ul style="list-style-type: none"> • $d \propto \sqrt{h}$ • $d = k\sqrt{h}$ • $k = 3.5$ • visible distance = 22.14 or height should be 32.7 or $k_2 = 3.16 \left(\text{from } \frac{20}{\sqrt{40}} \right)$ • no, with numerical comparison <p style="text-align: right;">5RE</p>
<p>Notes:</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
7	<p>Ans: 5.62 m</p> <ul style="list-style-type: none"> • method • strategy • substitution • solution 	<ul style="list-style-type: none"> • $BC = 3.3$ • use of cosine rule • $AC^2 = 2.9^2 + 3.3^2 - 2 \times 2.9 \times 3.3 \cos 130^\circ$ • 5.62 <p style="text-align: right;">4 RE</p>
<p>Notes:</p> <ul style="list-style-type: none"> (i) accept solutions in radians or gradians (ii) for any attempt involving Pythagoras or sine rule, only the 1st mark is available 		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
8 (a)	<p>Ans: 126.9 m²</p> <ul style="list-style-type: none"> • valid strategy • substitution • solution 	<ul style="list-style-type: none"> • $\frac{1}{2}ab \sin C$ • $\frac{1}{2} \times 15 \times 18 \times \sin 70^\circ$ • 126.9 <p style="text-align: right;">3KU</p>
<p>Notes:</p> <p>(i) evidence for the 1st mark may be implicit in the substitution</p>		
(b)	<p>Ans: 90°</p> <ul style="list-style-type: none"> • solution 	<ul style="list-style-type: none"> • 90° <p style="text-align: right;">1RE</p>
<p>Notes:</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
10 (a)	Ans: £152.80 <ul style="list-style-type: none"> • solution 	<ul style="list-style-type: none"> • 152.80 <p style="text-align: right;">1KU</p>
(b)	Ans: $C = 25d + 0.12m - 24$ <ul style="list-style-type: none"> • starting formula • continuation • formula 	<ul style="list-style-type: none"> • $25d$ • $0.12m$ • $C = 25d + 0.12m - 24$ or $C = 25d + 0.12(m - 200)$ <p style="text-align: right;">3RE</p>
Notes:		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
11 (a)	Ans: 21 <ul style="list-style-type: none"> • answer 	<ul style="list-style-type: none"> • 21 <p style="text-align: right;">1KU</p>
(b)	Ans: proof <ul style="list-style-type: none"> • forming equation • rearranging 	<ul style="list-style-type: none"> • $55 = \frac{1}{2}n(n-1)$ • $n^2 - n - 110 = 0$ <p style="text-align: right;">2RE</p>
Notes: <p>(i) for a solution of $55 = \frac{1}{2}n(n-1)$</p> $55 = \frac{1}{2}n^2 - n$ $110 = n^2 - n$ $n^2 - n - 110 = 0$ <p style="text-align: right;">award $\frac{1}{2}$</p>		
(c)	Ans: 11 <ul style="list-style-type: none"> • factorising • solving equation • selecting valid solution 	<ul style="list-style-type: none"> • $(n+10)(n-11) = 0$ • -10 and 11 • 11 <p style="text-align: right;">3RE</p>
Notes: <p>(i) for an answer of 11 without working</p> <p style="text-align: right;">award $\frac{0}{3}$</p>		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
12 (a)	Ans: 78.7, 258.7 <ul style="list-style-type: none"> • equation • first solution • second solution 	<ul style="list-style-type: none"> • $\tan x^\circ = 5$ • 78.7 • 258.7 (first solution + 180) <p style="text-align: right;">3RE</p>
Notes: <p>(i) for answers of 90 or 270, only the 1st mark is available</p>		
(b)	Ans: 438.7 <ul style="list-style-type: none"> • solution 	<ul style="list-style-type: none"> • 438.7 <p style="text-align: right;">1RE</p>
Notes: <p>(i) the solution must be consistent with a solution in part (a)</p> <p>(ii) for 450, following from 90, 270 in part (a) award $\frac{1}{1}$</p>		

**KU 18 marks
RE 33 marks**

[END OF PAPER 2 MARKING INSTRUCTIONS]

Final KU 45 Totals RE 45
