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	**Ans: 52 900 tonnes** • multiplying factor • power of 3 • solution (unrounded) • solution (rounded)	 • 1.08 • 1.08^3 • 52 907.90 • 52 900 **4KU**

Notes:

(i) for 52 900, with or without working — award $\frac{4}{4}$

(ii) for 245 000, with or without working $\left(\times 1.8^3\right)$ — award $\frac{3}{4}$

(iii) for 32 700, with or without working $\left(\times 0.92^3\right)$ — award $\frac{3}{4}$

(iv) for any other final answers, an unrounded solution must be stated to access the 3rd and 4th marks

(v) candidates using simple interest may only be awarded the last mark $\left((3 \times 3360) + 42\,000 = 52\,080 \rightarrow 52\,100\right)$

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
2 (a)	**Ans: 34, 29** • median • mode	• 34 • 29 **2KU**
(b)	**Ans:** $\frac{\mathbf{11}}{\mathbf{30}}$ • probability	• $\frac{11}{30}$ or equivalent **1KU**
Notes: (i) for median = 29 and mode = 34		award $\frac{1}{2}$

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
3	**Ans: £56.25** • valid strategy • processing • solution	 • 80% = 45 • $100\% = \frac{45}{0.8}$ • 56.25 **3KU**

Notes:

(i) for £56.25, with or without working — award $\frac{3}{3}$

(ii) for £37.50 (120% = £45), with working — award $\frac{2}{3}$

(iii) for £36 (80% of £45), with or without working — award $\frac{0}{3}$

(iv) for £54 (120% of £45), with or without working — award $\frac{0}{3}$

(v) **Caution**: Some candidates state 80% = 45 but continue as in notes (iii) or (iv). In these cases, the 1st mark is still available

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
4 (a)	**Ans:** $x + y = 60$ • equation	• $x + y = 60$ **1KU**
(b)	**Ans:** $50x + 20y = 1740$ • equation	• $50x + 20y = 1740$ **1KU**
(c)	**Ans: 18 fifty pence coins** • evidence of scaling • processing • value of x	• $20x + 20y = 1200$ or equivalent • $30x = 540$ or equivalent • 18 **3RE**

Notes:

(i) for 18 without working — award $\frac{0}{3}$

(ii) for 18 and 42 verified in **both** equations — award $\frac{1}{3}$

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
5 (a)	**Ans:** $\sqrt{65}$ • method • solution	• $OP^2 = 8^2 + 1^2$ • $\sqrt{65}$ or 8.06 **2RE**
(b)	**Ans:** $\sqrt{40}$ • method • solution	• $PT^2 = \left(\sqrt{65}\right)^2 - 5^2$ • $\sqrt{40}$ or 6.32 **2RE**
Notes: (i) the wrong form of Pythagoras should not be penalised in part (b), if already penalised in part (a)		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
6	**Ans: no, the boat is not beyond the horizon, with numerical comparison**	
	• variation statement	• $d \propto \sqrt{h}$
	• variation equation	• $d = k\sqrt{h}$
	• evaluating k	• $k = 3.5$
	• method to enable comparison	• visible distance = 22.14 or height should be 32.7 or $k_2 = 3.16$ $\left(\text{from } \frac{20}{\sqrt{40}}\right)$
	• answer and justification	• no, with numerical comparison **5RE**
Notes:		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
7	**Ans: 5.62 m** • method • strategy • substitution • solution	 • 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 **4 RE**

Notes:

(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)	**Ans: 126.9 m^2** • valid strategy • substitution • solution	 • $\frac{1}{2}ab\sin C$ • $\frac{1}{2}\times 15\times 18\times \sin\ 70^\circ$ • 126.9 **3KU**
Notes: (i) evidence for the 1st mark may be implicit in the substitution		
(b)	**Ans:** 90° • solution	 • 90° **1RE**
Notes:		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
9 (a)	**Ans: 150°** • solution	• 150° **1KU**
(b)	**Ans: 45.8 cm** • correct ratio • processing • processing • solution	or • $\frac{150}{360}$ | $\frac{5}{12}$ • $\frac{150}{360}=\frac{120}{2\pi r}$ | $\frac{120}{5/12}=288$ • $r=\frac{360}{150}\times\frac{120}{2\pi}$ | $r=\frac{288}{2\pi}$ • 45.8 | 45.8 **4RE**
Notes: (i) a calculation using πr^2 (which leads to $r=9.57$) cannot be awarded the 2nd mark		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
10 (a)	**Ans: £152.80** • solution	• 152.80 **1KU**
(b)	**Ans: $C = 25d + 0.12m - 24$** • starting formula • continuation • formula	• $25d$ • $0.12m$ • $C = 25d + 0.12m - 24$ or $C = 25d + 0.12(m - 200)$ **3RE**
Notes:		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
11 (a)	**Ans: 21** • answer	• 21 **1KU**
(b)	**Ans: proof** • forming equation • rearranging	• $55 = \frac{1}{2}n(n-1)$ • $n^2 - n - 110 = 0$ **2RE**
Notes: (i) for a solution of $55 = \frac{1}{2}n(n-1)$, $55 = \frac{1}{2}n^2 - n$, $110 = n^2 - n$, $n^2 - n - 110 = 0$ award $\frac{1}{2}$		
(c)	**Ans: 11** • factorising • solving equation • selecting valid solution	• $(n+10)(n-11) = 0$ • -10 and 11 • 11 **3RE**
Notes: (i) for an answer of 11 without working award $\frac{0}{3}$		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
12 (a)	**Ans: 78.7, 258.7** • equation • first solution • second solution	 • $\tan x^\circ = 5$ • 78.7 • 258.7 (first solution + 180) **3RE**
Notes: (i) for answers of 90 or 270, only the 1st mark is available		
(b)	**Ans: 438.7** • solution	 • 438.7 **1RE**
Notes: (i) the solution must be consistent with a solution in part (a) (ii) for 450, following from 90, 270 in part (a) award $\frac{1}{1}$		

KU 18 marks
RE 33 marks

[END OF PAPER 2 MARKING INSTRUCTIONS]

Final Totals	**KU 45** **RE 45**