Higher Grade - Paper 1 2008/2009

ANSWERS - Section A

1	D
2	A
3	B
4	C
5	C
6	A
7	B
8	C
9	B
10	D
11	D
12	B
13	A
14	C
15	B
16	B
17	A
18	A
19	C
20	A

	A	B	C	D
1	▭	▭	▭	■
2	■	▭	▭	▭
3	▭	■	▭	▭
4	▭	▭	■	▭
5	▭	▭	■	▭
6	■	▭	▭	▭
7	▭	■	▭	▭
8	▭	▭	■	▭
9	▭	■	▭	▭
10	▭	▭	▭	■
11	▭	▭	▭	■
12	▭	■	▭	▭
13	■	▭	▭	▭
14	▭	▭	■	▭
15	▭	■	▭	▭
16	▭	■	▭	▭
17	■	▭	▭	▭
18	■	▭	▭	▭
19	▭	▭	■	▭
20	■	▭	▭	▭

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HIGHER PRELIM PAPER 1 SECTION B
2008 – 09

	Give 1 mark for each •	Illustration(s) for awarding each mark
21(a)	ans: P(2, 4) **(4 marks)**	
	•1 knows to make derivative equal to 0	•1 $\frac{dy}{dx} = 0$
	•2 finds derivative	•2 $\frac{dy}{dx} = 6x - 3x^2 = 0$
	•3 solves for x	•3 $3x(2-x) = 0$: $x = 0, 2$
	•4 states coordinates of P	•4 P(2, 4)
(b)	ans: Q(– 1, 4) **(3 marks)**	
	•1 knows to equate functions	•1 $3x^2 - x^3 = 4$
	•2 uses app method to factorise expression	•2 evidence leading to $(x-2)(x-2)(x+1)$
	•3 solves and states coordinates of Q	•3 Q(– 1, 4)
(c)	ans: $6\frac{3}{4}$ **units**^{2} **(6 marks)**	
	•1 knows to use integration	•1 $\int$.....
	•2 uses correct integration	•2 $\int_{-1}^{2}(4-(3x^2-x^3))dx$
	•3 simplifies	•3 $\int_{-1}^{2}(4-3x^2+x^3)dx$
	•4 integrates	•4 $\left[4x - x^3 + \frac{x^4}{4}\right]_{-1}^{2}$
	•5 subs values	•5 $\left[4(2)-(2)^3+\frac{(2)^4}{4}\right]-\left[4(-1)-(-1)^3+\frac{(-1)^4}{4}\right]$
	•6 evaluates	•6 6 ¾ unit^2
22(a)	ans: $p = 1, q = -4, r = 3$ **(4 marks)**	
	•1 substitutes	•1 $f(g(a)) = (2-a)^2 - 1$
	•2 multiplies out and reorganises	•2 $4 - 4a + a^2 - 1 = a^2 - 4a + 3$
	•3 states values of p, q and r	•3 $p = 1, q = -4, r = 3$
	•4 states values of p, q and r	•4 award 1 mark for any two correct and 1 mark for third value correct
(b)	ans: $a = 5$ **(2 marks)**	
	•1 equates to 8, reorganises and factorises	•1 $a^2 - 4a + 3 = 8$: $a^2 - 4a - 5 = 0$ $(a-5)(a+1) = 0$
	•2 solves and chooses correct value for a	•2 $a = 5$

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	Give 1 mark for each •	Illustration(s) for awarding each mark
23	ans: $A(\frac{11\pi}{12}, \frac{1}{2})$ (4 marks)	
	•1 equates line & curve, reorganises	•1 $\sin 2x + 1 = \frac{1}{2}; \sin 2x = -\frac{1}{2}$
	•2 finds values for $2x$	•2 $2x = \frac{7\pi}{6}, \frac{11\pi}{6}$
	•3 finds values for x	•3 $x = \frac{7\pi}{12}, \frac{11\pi}{12}$
	•4 states coordinates of A	•4 $A\ (\frac{11\pi}{12}, \frac{1}{2})$
24(a)	ans: 60 (2 marks)	
	•1 knows how to find limit	•1 $L = \frac{24}{1-0\cdot 6}$
	•2 moves term to LHS and divides	•2 60
(b)	ans: 10 (2 marks)	
	•1 makes RR equal to 30	•1 $0\cdot 6U_0 + 24 = 30$ [stated or implied]
	•2 solves for U_0	•2 $0\cdot 6U_0 = 6; U_0 = 10$
(c)	ans: $a = \frac{2}{5}; b = 36$ (3 marks)	
	•1 subs for b and finds expression for limit	•1 $U_{n+1} = aU_n + 90a; L = \frac{90a}{1-a}$
	•2 equates limit to 60 and solves for a	•2 $\frac{90a}{1-a} = 60; 60 - 60a = 90a; a = \frac{2}{5}$;
	•3 finds value of b	•3 $b = 90 \times \frac{2}{5} = 36$

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