

**Mathematics**  
**Higher Prelim Examination 2008/2009**

**NATIONAL  
 QUALIFICATIONS**

**Paper 1 - Section A - Answer Sheet**

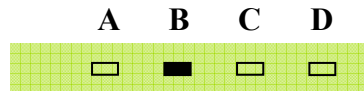
NAME :

CLASS :

TEACHER :

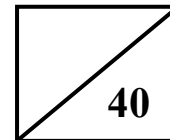
You should use an HB pencil.  
 Erase all incorrect answers thoroughly.

Indicate your choice of answer with a single mark as in this example →

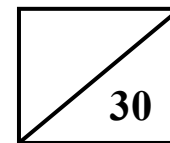


	A	B	C	D
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2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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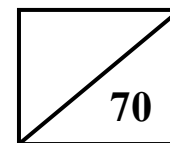
Section A



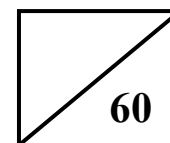
Section B



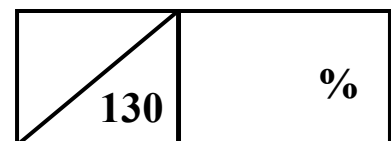
Total (P1)



Total (P2)



Overall Total



*Please make sure you have filled in all your details above before handing in this answer sheet.*

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 D

	A	B	C	D
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19	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Give 1 mark for each •	Illustration(s) for awarding each mark
21(a)	ans: P(2, 4) (3 marks)	
	<ul style="list-style-type: none"> <li>•<sup>1</sup> knows to make derivative equal to 0</li> <li>•<sup>2</sup> finds derivative</li> <li>•<sup>3</sup> solves for x and completes</li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>\frac{dy}{dx} = 0</math></li> <li>•<sup>2</sup> <math>\frac{dy}{dx} = 6x - 3x^2 = 0</math></li> <li>•<sup>3</sup> <math>3x(2 - x) = 0; x = 0, 2 \quad y = 4</math></li> </ul>
	(b) ans: Q(-1, 4) (4 marks)	
(c)	<ul style="list-style-type: none"> <li>•<sup>1</sup> knows to equate functions</li> <li>•<sup>2</sup> sets up synthetic division</li> <li>•<sup>3</sup> uses app method to factorise expression</li> <li>•<sup>4</sup> solves and states coordinates of Q</li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>3x^2 - x^3 = 4</math></li> <li>•<sup>2</sup> <math display="block">2 \begin{array}{r rrrr} &amp; -1 &amp; 3 &amp; 0 &amp; -4 \end{array}</math></li> <li>•<sup>3</sup> evidence leading to <math>(x - 2)(x - 2)(x + 1)</math></li> <li>•<sup>4</sup> Q(-1, 4)</li> </ul>
	ans: $6\frac{3}{4}$ units <sup>2</sup> (6 marks)	
	<ul style="list-style-type: none"> <li>•<sup>1</sup> knows and starts to integrate</li> <li>•<sup>2</sup> uses correct integration</li> <li>•<sup>3</sup> integrates</li> <li>•<sup>4</sup> subs values</li> <li>•<sup>5</sup> evaluates</li> <li>•<sup>6</sup> answer</li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>\int \dots\dots</math> any term correctly integrated</li> <li>•<sup>2</sup> <math>\int_{-1}^2 4 - (3x^2 - x^3) dx</math></li> <li>•<sup>3</sup> <math>\left[ 4x - x^3 + \frac{x^4}{4} \right]_{-1}^2</math></li> <li>•<sup>4</sup> <math>\left[ 4(2) - (2)^3 + \frac{(2)^4}{4} \right] - \left[ 4(-1) - (-1)^3 + \frac{(-1)^4}{4} \right]</math></li> <li>•<sup>5</sup> <math>(8 - 8 + 4) - (-4 + 1 + \frac{1}{4})</math></li> <li>•<sup>6</sup> <math>4 - (-2\frac{3}{4}) = 6\frac{3}{4}</math> units<sup>2</sup></li> </ul>
22	ans: $p = 1, q = -4, r = 3$ (3 marks)	
	<ul style="list-style-type: none"> <li>•<sup>1</sup> substitutes</li> <li>•<sup>2</sup> multiplies out and reorganises</li> <li>•<sup>3</sup> states values of p, q and r</li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>f(g(a)) = (2 - a)^2 - 1</math></li> <li>•<sup>2</sup> <math>4 - 4a + a^2 - 1 = a^2 - 4a + 3</math></li> <li>•<sup>3</sup> <math>p = 1, q = -4, r = 3</math></li> </ul>
23	ans: $k = \frac{1}{2}$ (3 marks)	
	<ul style="list-style-type: none"> <li>•<sup>1</sup> uses laws of logs</li> <li>•<sup>2</sup> writes in exp. form</li> <li>•<sup>3</sup> solves for k</li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>\log_2(k \times 16) = 3</math></li> <li>•<sup>2</sup> <math>16k = 2^3 = 8</math></li> <li>•<sup>3</sup> <math>k = \frac{1}{2}</math></li> </ul>

	Give 1 mark for each •	Illustration(s) for awarding each mark
24	<p>ans: <math>A\left(\frac{11\pi}{12}, \frac{1}{2}\right)</math> (4 marks)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> equates line &amp; curve</li> <li>•<sup>2</sup> finds values for <math>2x</math></li> <li>•<sup>3</sup> finds values for <math>x</math></li> <li>•<sup>4</sup> states coordinates of A</li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>\sin 2x + 1 = \frac{1}{2}</math></li> <li>•<sup>2</sup> <math>2x = \frac{7\pi}{6}, \frac{11\pi}{6}</math></li> <li>•<sup>3</sup> <math>x = \frac{7\pi}{12}, \frac{11\pi}{12}</math></li> <li>•<sup>4</sup> <math>A\left(\frac{11\pi}{12}, \frac{1}{2}\right)</math></li> </ul>
25(a)	<p>ans: 60 (2 marks)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> knows how to find limit</li> <li>•<sup>2</sup> moves term to LHS and divides</li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>L = \frac{24}{1-0.6}</math></li> <li>•<sup>2</sup> 60</li> </ul>
(b)	<p>ans: 10 (2 marks)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> makes RR equal to 30</li> <li>•<sup>2</sup> solves for <math>U_0</math></li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>0.6U_0 + 24 = 30</math> [stated or implied]</li> <li>•<sup>2</sup> <math>0.6U_0 = 6; U_0 = 10</math></li> </ul>
(c)	<p>ans: <math>a = \frac{2}{5}; b = 36</math> (3 marks)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> subs for <math>b</math> and finds expression for limit</li> <li>•<sup>2</sup> solves for <math>a</math></li> <li>•<sup>3</sup> finds value of <math>b</math></li> </ul>	<ul style="list-style-type: none"> <li>•<sup>1</sup> <math>60 = \frac{90a}{1-a}</math> or <math>60 = a \times 60 + 90a</math></li> <li>•<sup>2</sup> <math>a = \frac{2}{5};</math></li> <li>•<sup>3</sup> <math>b = 90 \times \frac{2}{5} = 36</math></li> </ul>