



# Regional Final

## *Supervisor's Booklet*

*Please ensure that students do not have access to this booklet, and take care to hold it so that answers cannot be seen.*



## *for Information only: DO NOT USE!* Mini-Relay Score Sheet

School number:

School name: \_\_\_\_\_

*Circle the appropriate score for each round.*

Round A	Round B	Round C
10	10	10
8	8	8
6	6	6
4	4	4
2	2	2
0	0	0

Round D	Round E	Round F
10	10	10
8	8	8
6	6	6
4	4	4
2	2	2
0	0	0

Grand Total:

### Marking Instructions – a reminder

10 points if a correct answer to Qu 4 is handed in before the 4 minute whistle.

8 points if a correct answer to Qu 4 is handed in before the 6 minute whistle.

Following the 6 minute whistle any answer to Question 4 is ignored. Answers are marked from Qu 1 with 2 marks for each correct answer given before the first wrong answer. If an answer is wrong, no subsequent answers are to be marked.

Remember, only three attempts at Qu 4 are allowed. After a third failure the question is ignored for all subsequent marking.



## MINI-RELAY ANSWERS

<b>A1</b>	<b>7</b>
<b>A2</b>	<b>13</b>
<b>A3</b>	<b>12</b>
<b>A4</b>	<b><math>30\pi</math></b>

<b>D1</b>	<b>12</b>
<b>D2</b>	<b>6</b>
<b>D3</b>	<b>45</b>
<b>D4</b>	<b>36</b>

<b>B1</b>	<b><math>\frac{1}{2}</math></b>
<b>B2</b>	<b>1</b>
<b>B3</b>	<b>11</b>
<b>B4</b>	<b><math>11 - 17\sqrt{3}</math></b>

<b>E1</b>	<b>8</b>
<b>E2</b>	<b>32</b>
<b>E3</b>	<b>24</b>
<b>E4</b>	<b>90</b>

<b>C1</b>	<b>-10</b>
<b>C2</b>	<b>35</b>
<b>C3</b>	<b>1.5</b>
<b>C4</b>	<b>1.2 or <math>\frac{6}{5}</math></b>

<b>F1</b>	<b>3</b>
<b>F2</b>	<b>8</b>
<b>F3</b>	<b>-1</b>
<b>F4</b>	<b>12</b>



# Senior Team Maths Challenge 2008



		2		3				4	5
		6						7	
	8						9	10	
11			12			13			
						14			15
16	17								
			18		19				
20		21					22		
					23				24
25			26				27		

## Across

- 1  $p^3 - p^2 - 3$ , where  $p$  is a prime number
- 3 Half the product of the distinct factors of 12
- 4  $x$  where  $x^2 - 40x + 144 = 0$
- 6 Mean of 1 Across, 8 Across and 9 Across
- 8 Sum of the prime factors of 15 Down
- 9 A triangle number squared
- 12 7 Down times 2 Down minus twice 1 Down
- 14 Multiple of both the square root of 4 Across and 7 Down
- 16 Twice a Fibonacci number
- 18 8 Across plus a multiple of 10 Down but not divisible by four
- 20 27 Across minus 7 Down
- 22 To the nearest whole number, the result of twice 11 Down divided by 1 Down
- 23 The difference between 25 Across and 23 Across is 2 Down
- 25 *see 23 Across*
- 26 20 Across plus the smallest difference between 27 Across and a Fibonacci number
- 27 A cube

## Down

- 1  $p^2 + 2(p - 7)$  where  $p$  is a prime number
- 2 Exterior angle in degrees of a regular polygon
- 3 Multiple of 1 Down
- 5 One more than a multiple of four and one less than a multiple of three
- 7 Four more than a triangle number, two less than a square number
- 10 Twice a Fibonacci number
- 11 One more than the difference between 5 Down and 15 Down
- 12 Half the lowest common multiple of 6 Across and 8 Across
- 13 Number where consecutive digits differ by two
- 15 Product of two consecutive primes, its digit product being less than its digit sum
- 17  $x^2 + 2x + 2$  where  $x$  is an integer
- 19 Eight more than a multiple of eleven
- 20 Product of one sixth of 24 Down and one more than one sixth of 24 Down
- 21 Multiple of 7 Down
- 22 Number whose digit sum is equal to the highest common factor of 4 Across and 8 Across
- 24 Two thirds of a square number



## CROSS NUMBER

Completed Grid

<sup>1</sup> 2	9	<sup>2</sup> 1		<sup>3</sup> 2	7	3		<sup>4</sup> 3	<sup>5</sup> 6
1		<sup>6</sup> 2	5	4			<sup>7</sup> 1		4
	<sup>8</sup> 3	0		3			<sup>9</sup> 4	<sup>10</sup> 4	1
<sup>11</sup> 4			<sup>12</sup> 1	6	3	<sup>13</sup> 8		6	
2			9			<sup>14</sup> 6	7	6	<sup>15</sup> 2
<sup>16</sup> 1	<sup>17</sup> 2	2	0			4			2
	9		<sup>18</sup> 5	6	<sup>19</sup> 2	2			1
<sup>20</sup> 2	0	<sup>21</sup> 2			2		<sup>22</sup> 4	0	
7		8			<sup>23</sup> 1	4	0		<sup>24</sup> 9
<sup>25</sup> 2	0		<sup>26</sup> 2	1	9		<sup>27</sup> 2	1	6

### Marking Instructions – a reminder

Pairs may only communicate through the teacher, for instance to request that the other pair work on a particular clue.

When a pair enters an answer in the Answer Grid, the teacher checks each digit of the answer.

If it is correct, tick it and award one mark; if it is wrong, cross it out and enter the correct digit. The correct answer is then shown to both pairs so that they are up-to date.

A pair may enter just one digit if they wish, rather than a complete answer.

A pair may sacrifice a square, by guessing, if they wish.



## GROUP ROUND ANSWERS

<p><b>1.</b> Sum of digits:</p> <p style="text-align: center;">253</p>	<p><b>2.</b> Area of parallelogram:</p> <p style="text-align: center;"><math>\frac{2Qx}{y} \text{ cm}^2</math></p>
<p><b>3.</b> Number of numbers:</p> <p style="text-align: center;">32</p>	<p><b>4.</b> Factorised quadratic:</p> <p style="text-align: center;"><math>(3x + 4)(40x - 21)</math></p>
<p><b>5.</b> Ages of daughters (in any order):</p> <p style="text-align: center;">2, 2, 9</p>	<p><b>6.</b> Values of <math>x</math>:</p> <p style="text-align: center;">-1, -5</p>
<p><b>7.</b> Angle <math>QMR</math>:</p> <p style="text-align: center;">75 degrees</p>	<p><b>8.</b> Diameters of the circles (in any order):</p> <p style="text-align: center;">3, 7, 11</p>
<p><b>9.</b> Fraction of the volume of the cube:</p> <p style="text-align: center;"><math>\frac{1}{6}</math></p>	<p><b>10.</b> Smallest of the 101 integers:</p> <p style="text-align: center;">10151</p>

6 points for each correct answer.

TOTAL SCORE ( /60)= \_\_\_\_\_



## Feedback Questionnaire

Which heat did you attend?

In questions 1, 2 and 3, please rate the following aspects of the course using a scale of 1 to 4, where:

1 = Poor;      2 = Adequate;      3 = Good;      4 = Excellent.

Please circle the appropriate answer.

1: The suitability of the venue 1   2   3   4

Comments \_\_\_\_\_

2: Refreshments (if applicable) 1   2   3   4

Comments \_\_\_\_\_

3: The organisation of the event 1   2   3   4

Comments \_\_\_\_\_

4: What are your comments on each of the three rounds?

Comments \_\_\_\_\_  
\_\_\_\_\_

5: How did you find the difficulty level of the questions?

Comments \_\_\_\_\_  
\_\_\_\_\_

6: Would you recommend this event to others? Yes / No

7. Would you have preferred a different start time for the event? Yes / No  
If yes what start time would you have preferred? \_\_\_\_\_

8. Please detail any suggestions for improvement to this event and give any other comments that you would like to make.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Thank you for completing this questionnaire.



# Senior Team Maths Challenge 2008



# BACK PAGE