



National 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.

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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 Question 4 are allowed. After a third failure the question is ignored for all subsequent marking.



MINI-RELAY ANSWERS

A1	2
A2	25
A3	320
A4	$25\pi - 40$

D1	$\frac{1}{3}$
D2	3
D3	64
D4	$\sqrt{13}$

B1	12
B2	7
B3	301
B4	7

E1	8
E2	2
E3	6
E4	12

C1	48
C2	5
C3	12
C4	6

F1	3
F2	10
F3	2
F4	110



Senior Team Maths Challenge 2009



	1	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				28				

Across

- 1 p^{p-3} where p is prime
- 4 $16 \text{ Across} + 14 \text{ Across} - 27 \text{ Across} + \text{half the difference of } 13 \text{ Down and } 15 \text{ Down}$
- 6 Product of two consecutive integers
- 8 Odd multiple of eight, the highest common factor of 8 Across and 18 Across is two
- 9 The sum of 3 Down, 4 Across and twice 1 Across
- 11 Palindrome, the square of whose digit sum is equal to four times its digit product
- 14 27 Across minus a multiple of thirteen
- 16 x^4 where x is an integer
- 18 Multiple of three
- 20 Half the product of two consecutive Fibonacci numbers
- 21 Divisible by three but not nine
- 23 Two more than 28 Across minus 7 Down
- 25 21 Across plus 4 Down
- 26 Multiple of thirteen
- 27 $16 \text{ Across} + 11 \text{ Across}$
- 28 One more than a prime number cubed

Down

- 2 One third the product of two consecutive Fibonacci numbers
- 3 Triangle number
- 4 Square
- 5 One more than a square and three less than a cube
- 7 Two more than 28 Across minus 23 Across
- 10 Five less than a triangle number
- 12 Multiple of 3 Down, not divisible by five or nine
- 13 Twice the digit product plus half the digit sum of 15 Down
- 15 Product of two consecutive primes
- 17 $2^n + 1$ where n is an even integer
- 18 $[1 \times 2 \times 3 \times \dots \times n] - [1 \times 2 \times 3 \times \dots \times (n - 1)]$ where n is an integer
- 19 Prime three less than a multiple of eleven
- 21 The mean of 17 Down, 19 Down and 21 Down is one more than 1 Across
- 22 Palindrome which is twice a number one less than a multiple of twelve
- 24 Digit sum of 24 Down is a multiple of six
- 25 Multiple of half 10 Down



CROSS NUMBER

Completed Grid

	¹ 2	² 4	0	³ 1		⁴ 2	3	6	
⁵ 1		2		⁶ 3	4	2		⁷ 4	
2		⁸ 7	7	6		⁹ 5	¹⁰ 1	7	4
¹¹ 2	¹² 4	2			¹³ 1		6		2
	0		¹⁴ 3	¹⁵ 4	7		¹⁶ 6	¹⁷ 2	5
¹⁸ 4	8	¹⁹ 6		²⁰ 3	5	7		5	
3		1		7			²¹ 6	7	²² 8
²³ 2	4	3	²⁴ 7		²⁵ 9	0	3		3
0			²⁶ 4	2	9		3		8
	²⁷ 8	6	7		²⁸ 6	8	6	0	

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

1. Ratio: $2 : 5$	2. Number of positive factors: 270
3. Perimeter of pentagon: $12\frac{3}{4}$ or $\frac{51}{4}$	4. Probability of a right-angled triangle: $\frac{7}{10}$
5. $k = 2835$ $n = 23$	6. Sum of the digits: 35
7. $M = 2519$	8. $x = 6$
9. Numerical value of $\cos BJT$: $\frac{5}{7}$	10. Probability of total score 2: $\frac{1215}{4096}$

6 points for each correct answer.

TOTAL SCORE (/60)= _____

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