



# Senior Team Maths Challenge Group Answers



<b>1.</b> Total sum of money  £810	<b>2.</b> Value of expression  2009
<b>3.</b> $p$  3	<b>4.</b> Area of square  $\frac{1600}{49} \text{ cm}^2$
<b>5.</b> $a_{10} + a_8 + a_6 + a_4 + a_2$  341	<b>6.</b> Fraction saved  $\frac{37}{55}$
<b>7.</b> Time to paint house  10 hours	<b>8.</b> Maximum value of $A(x)$  844
<b>9.</b> Area of trapezium  $48 \text{ cm}^2$	<b>10.</b> Coordinates of vertex  (9, 12)

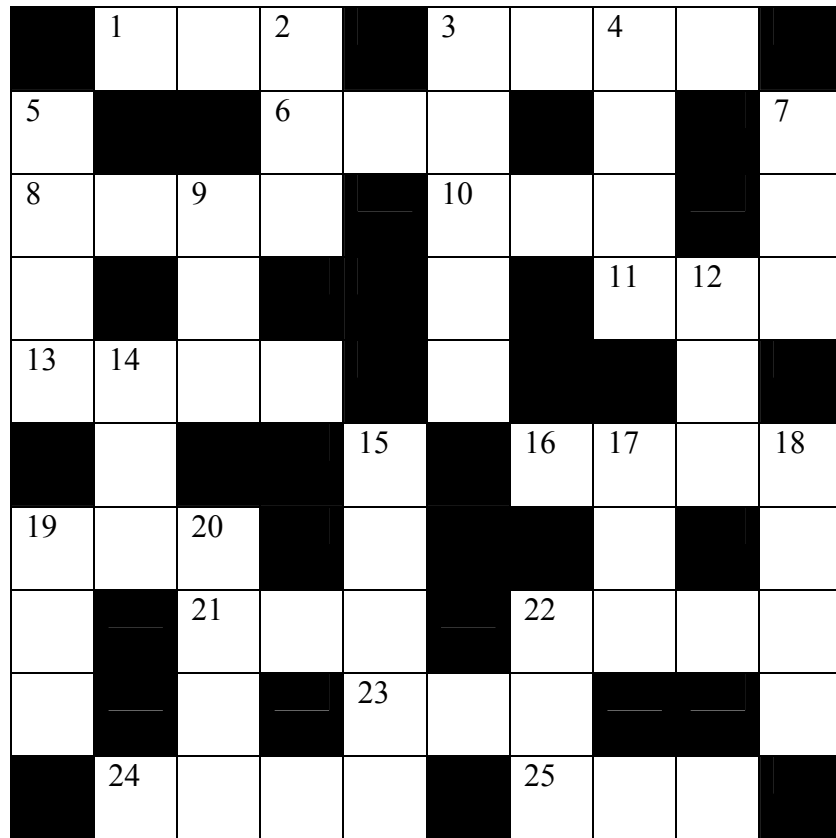
Award 6 points for each correct answer:

Write the total score on the Group answer sheet.

Please ensure the Team number and School / College name are written on the Group answer sheet.



# Senior TMC National Final 2008 Crossnumber Round



### Across

- 1  $p^{p-2}$  where  $p$  is a prime number
- 3 Sum of 9 Down, 22 Down and the lowest common multiple of 9 Down and 22 Down
- 6 Sum of consecutive square numbers starting with 1
- 8 Multiple of 3 but not  $3^2$ , multiple of 8 but not  $8^2$
- 10 Obtuse angle in degrees between the lines  $y = x$  and  $y = \sqrt{3}x$  :  $[\tan^{-1}\sqrt{3} = 60^\circ]$
- 11  $5p$  where  $p$  is a prime number
- 13 Multiple of 11 Across divided by 5
- 16  $N$  more than the sum of the interior angles of a regular polygon with  $N$  sides.
- 19 Interior angle of a regular polygon
- 21 Product of the digit sum and digit product of 19 Across
- 22 Product of two consecutive prime numbers
- 23  $(0.25)^{-4}$
- 24 Fibonacci number
- 25  $2^5$  multiplied by the two smallest prime factors of 20 Down

### Down

- 2 Solution to the equation  $x^2 - 514x + 1024 = 0$
- 3 Sum of the even numbers from 100 to 412 inclusive
- 4 Thrice 24 Across minus one thousand and one
- 5 Area of the triangle enclosed by the lines  $x = 0$ ,  $y = 3x$  and  $y = -\frac{1}{3}x + 90$
- 7 5 times a cube number but not a perfect square
- 9 Distance between the points (1 Across, 85) and (65, 10 Across)
- 12 Prime factor of 8 Across
- 14 Sum of three consecutive Fibonacci numbers
- 15 Palindromic number giving remainder 7 when divided by 9
- 17  $(\sqrt[3]{125})^4$
- 18 Mean of 16 Across and 22 Across
- 19 Product of the digit sum and digit product of 7 Down
- 20 Lowest Common Multiple of 1 Across and 10 Across
- 22 One less than 10 Across



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Crossnumber Round



	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			

**Across**

- 1  $p^{p-2}$  where  $p$  is a prime number
- 3 Sum of 9 Down, 22 Down and the lowest common multiple of 9 Down and 22 Down
- 6 Sum of consecutive square numbers starting with 1
- 8 Multiple of 3 but not  $3^2$ , multiple of 8 but not  $8^2$
- 10 Obtuse angle in degrees between the lines  $y = x$  and  $y = \sqrt{3}x$  :  $[\tan^{-1}\sqrt{3} = 60^\circ]$
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5			6						7
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							11	12	
13	14								
				15		16	17		18
19		20							
		21				22			
				23					
	24					25			

**Down**

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Completed Grid

	1	2	5		4	3	6	4	
1			1	4	0		7		1
2	7	1	2		1	6	5		3
1		0			9		1	1	5
5	7	0	4		2			1	
	5			4		1	6	3	1
1	4	4		2			2		5
3		1	4	4		1	5	1	7
5		2		2	5	6			4
	2	5	8	4		4	8	0	



Senior TMC National Final 2008  
Crossnumber Round



Team Number.....

School / College Name .....

	1		2		3		4			Total (7)
5			6						7	Total (6)
8		9			10					Total (8)
							11	12		Total (6)
13	14									Total (6)
				15		16	17		18	Total (6)
19		20								Total (6)
		21				22				Total (8)
				23						Total (6)
	24					25				Total (7)

Total score = \_\_\_\_\_/66



Mini Relay Solutions

Team No..... School/College Name.....

A1	3	B1	48	C1	60
A2	41	B2	12	C2	6
A3	11	B3	24	C3	26
A4	10	B4	3	C4	264

Correct answers to questions 1, 2 and 3 score four points; a correct answer to question 4 scores 8 points. Mark the questions in order until one is wrong or they are all correct. If one is wrong hand the sheet back to the competitor who submitted the wrong answer. When the sheet is marked a subsequent time only half marks (i.e. 2 for Questions 1, 2 or 3 and 4 for question 4) may be given for that question. Subsequent answers may still receive full marks.

Please circle the marks awarded:

Round A			Round B			Round C		
<b>1</b>	4	2	<b>1</b>	4	2	<b>1</b>	4	2
<b>2</b>	4	2	<b>2</b>	4	2	<b>2</b>	4	2
<b>3</b>	4	2	<b>3</b>	4	2	<b>3</b>	4	2
<b>4</b>	8	4	<b>4</b>	8	4	<b>4</b>	8	4
<b>Total A</b>			<b>Total B</b>			<b>Total C</b>		

**Total A + B + C = \_\_\_\_\_**