



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.



Senior Team Maths Challenge 2007

Crossnumber Round



1	2		3		4		5	6		7
			8					9		
10					11					
2			12	13			14		15	
		16		17		18	4			
19	20							21		
			22	8						
23		24				25	26			27
				28	29		30		31	4
32	6				33					
		34					35			

Across

- 1 Palindrome
 5 Remainder when forty is divided by a prime less than twenty five
 8 Fibonacci number whose digit sum is divisible by four
 9 x^{n-1} where x is an integer
 10 Divisible by one sixth of 12 Across, but not one third of 12 Across
 11 Four times the square root of 9 Across, minus one.
 12 Exterior angle in degrees of a regular polygon with a number of sides divisible by five
 14 24 Down minus 10 Down; divisible by two but not four
 17 17 Across minus its digit sum is a square number
 19 One more than a multiple of nine
 21 25 Across - 12 Across + 8 Across; it has a digit sum equal to three
 22 18 Down is five more than the difference between 22 Across and 35 Across
 23 Odd number whose digit sum is divisible by five
 25 Square of an odd number
 28 Triangle number not divisible by three
 30 Divisible by 2 and 3 but not by 3^2 or $(2^2 + 3^2)$
 32 2^4 multiplied by a prime number
 33 One more than 12 Across divided by three eighths
 34 Twice a prime number and also the sum of two square numbers
 35 $p^3 + p^2 - 1$ where p is a prime number

Down

- 2 Prime factor of 24 Down
 3 Palindrome
 4 Remainder when divided by seven is four
 6 $x(x+1)$ where x is an integer
 7 Number divisible by 7 giving remainder 2 when divided by 9
 10 Twice a prime number; the difference between 24 Down and 14 Across
 13 x^4 minus three where x is an integer
 14 Twice a prime number
 15 Product of two consecutive prime numbers
 16 Sum of three consecutive Fibonacci numbers
 18 Five more than the difference between 22 Across and 35 Across
 20 Exterior angle in degrees of a regular polygon
 21 One twelfth of the result, two hundred and fifty seven minus 5 Across
 22 Mean of 11 Across, 21 Down and 34 Across
 23 2 Down plus three times 7 Down
 24 Eight times the difference between 15 Down and twice its digit sum
 26 Highest common factor of the digit sum and digit product is a square not equal to one
 27 Cube
 29 27 Down + 16 Down - 14 Down
 31 Sum of the factors of 20 Down



Completed Grid

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

**Group Answers**

1. Largest number 2178	2. Average speed 75 km/h
3. Four values of x -2, 2, 4 and 6	4. Max. length of longest edge 42 cm
5. Total area of shaded region $8-2\pi$ units ²	6. Number of different results 232
7. $x = 11$	8. Mean of the five integers 13
9. Number 42857	10. Area of rectangle 26 cm^2

Award 6 points for each correct answer:

Write the total score on the Group answer sheet.

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



Mini Relay Solutions

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

A1	6	B1	3	C1	6
A2	9	B2	70	C2	11
A3	5	B3	30	C3	10
A4	6	B4	210	C4	35

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		
1	4	2	1	4	2	1	4	2
2	4	2	2	4	2	2	4	2
3	4	2	3	4	2	3	4	2
4	8	4	4	8	4	4	8	4
Total A			Total B			Total C		

Total A + B + C = _____