



UKMT Team Maths Challenge 2010



Regional Finals

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.



UKMT Team Maths Challenge 2010

Head to Head Score Sheet

School number: School name: _____

Round A			Round B		
A1	3	1	B1	3	1
A2	3	1	B2	3	1
A3	3	1	B3	3	1
A4	3	1	B4	3	1
Bonus	3		Bonus	3	
Total	<input type="text"/>		Total	<input type="text"/>	

Round C			Round D		
C1	3	1	D1	3	1
C2	3	1	D2	3	1
C3	3	1	D3	3	1
C4	3	1	D4	3	1
Bonus	3		Bonus	3	
Total	<input type="text"/>		Total	<input type="text"/>	

Grand Total:



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HEAD TO HEAD – Answers

A1	12	C1	60
A2	9	C2	66
A3	120	C3	72
A4	184	C4	36π
B1	747	D1	24
B2	45	D2	12
B3	18	D3	4
B4	$\frac{7}{18}$	D4	270



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CROSSNUMBER

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				29			

Across:

- 1 A prime factor of 8765 (4)
- 4 The interior angle of a regular polygon; its digits have a product of 12 (3)
- 6 A Fibonacci number whose digits add up to twenty-four (3)
- 7 A prime number which is one greater than a square number (2)
- 8 Ninety-nine greater than the number formed by reversing the order of the digits (3)
- 10 A multiple of 25 Across (3)
- 12 9 Down multiplied by seven (3)
- 15 A number with seven factors (2)
- 17 The third side of a right-angled triangle with hypotenuse 9 Down and other side 25 Across (2)
- 19 (10 Across) percent of 8 Across (3)
- 21 An odd multiple of nine (3)
- 23 The product of the seventh prime number and the eleventh prime number (3)
- 25 An even number (2)
- 26 The lowest common multiple of 25 Across and 11 Down (3)
- 28 A multiple of eleven, and also the mean of 12 Across, 16 Down, 19 Across, 24 Down and 27 Down (3)
- 29 A power of nineteen (4)

Down:

- 2 An even square number (3)
- 3 One third of 21 Across (2)
- 4 The interior angle of the regular polygon which has twice as many sides as the regular polygon whose interior angle is 4 Across (3)
- 5 One less than a multiple of eleven (3)
- 8 A power of nine (4)
- 9 The mean of 3 Down, 7 Across, 13 Down, 17 Across and 27 Down (2)
- 11 Ninety-one less than 10 Across (2)
- 13 The sum of the squares of the digits of 23 Across (2)
- 14 A factor of 4567 (4)
- 16 The difference between 11 Down and 3 Down (2)
- 18 The square root of 8 Down (2)
- 20 The highest common factor of 10 Across and 24 Down (2)
- 21 The total number days in a year in the months whose letters do not contain the letter A (3)
- 22 A prime number that is ten less than a cube number (3)
- 24 A square number multiplied by five; its digits have a product of forty (3)
- 27 A triangle number which is the sum of two prime numbers that differ by eight (2)



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CROSSNUMBER

Completed Grid

1	2		3		4	5		
1	7	5	3		1	6	2	
			6			7		
	8		9	8	7		3	7
8		9			10	11		
6	4	5			1	4	0	
		12	13					14
5		3	7	1		9		4
15					16		17	
6	4		8		1		4	5
		18		19		20		
1		8		9	0	3		6
	21		22			23	24	
	1	1	7			5	2	7
25			26		27			
2	8		1	9	6		4	
	28				29			
	3	1	9		6	8	5	9

Marking Instructions – a reminder

Pairs may only communicate through the teacher, and only 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.



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RELAY score sheet

Team number

School name

A1	21 times	B8	22
B1	5:54	A9	Thursday
A2	87	B9	26
B2	1440 degrees	A10	$\frac{8}{17}$
A3	2 pounds, 15 shillings and 5 pence	B10	£2000
B3	36%	A11	36 sweets
A4	231	B11	550 cm
B4	40 times	A12	92 ducats
A5	416 ml	B12	£2.50
B5	$\frac{14}{25}$	A13	75 metres
A6	2, 5, 6, 7, 10	B13	A 25, B 50, C 10, D 20, E 5
B6	$\frac{3}{10}$ or 0.3	A14	$\frac{6}{13}$
A7	£1690	B14	110 years
B7	3 pounds, 5 shillings and 9 pence	A15	12 days
A8	4 km/h	B15	$\frac{47}{45}$ or $1\frac{2}{45}$ (either)

Correct answers score 2 points:

TOTAL SCORE = _____



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GROUP ANSWERS

1. Possible codes (can be written as, e.g., 214 or 2,1,4): 214, 634, 319, 629	2. LIBEL = 132
3. Numbers are 64 and 15625	4. Speed required: 48 miles per hour
5. $a + b + c =$ 10.5 or $10\frac{1}{2}$ or $\frac{21}{2}$	6. Probability: $\frac{4}{9}$
7. Ratio of areas, $P : Q$ 9 : 8	8. Time taken: 6 hours
9. Number of sides: 7	10. Maximum product: 56

Award 6 points for each correct answer.

TOTAL SCORE = _____



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