UKMT Team Maths Challenge 2009

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 2009

Head to Head Score Sheet

School number: ☐ School name:_____

Round A		Round B		Round C	
A1	2 1	B1	2 1	C1	2 1
A2	2 1	B2	2 1	C2	2 1
A3	2 1	B3	2 1	C3	2 1
A4	2 1	B4	2 1	C4	2 1
Bonus	2	Bonus	2	Bonus	2
Total		Total		Total	

Round D		Round E		Round F	
D1	2 1	E1	2 1	F1	2 1
D2	2 1	E2	2 1	F2	2 1
D3	2 1	E3	2 1	F3	2 1
D4	2 1	E4	2 1	F4	2 1
Bonus	2	Bonus	2	Bonus	2
Total		Total		Total	

Grand Total:

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HEAD TO HEAD – Answers

A1	**2009**
A2	**6**
A3	**9**
A4	**16**

B1	**20**
B2	**10**
B3	**4**
B4	**1120**

C1	**8**
C2	**10**
C3	**3**
C4	**72**

D1	**16**
D2	**5**
D3	**36**
D4	**18**

E1	**18**
E2	**54**
E3	**120**
E4	**60**

F1	**4**
F2	**11**
F3	**5**
F4	**20**

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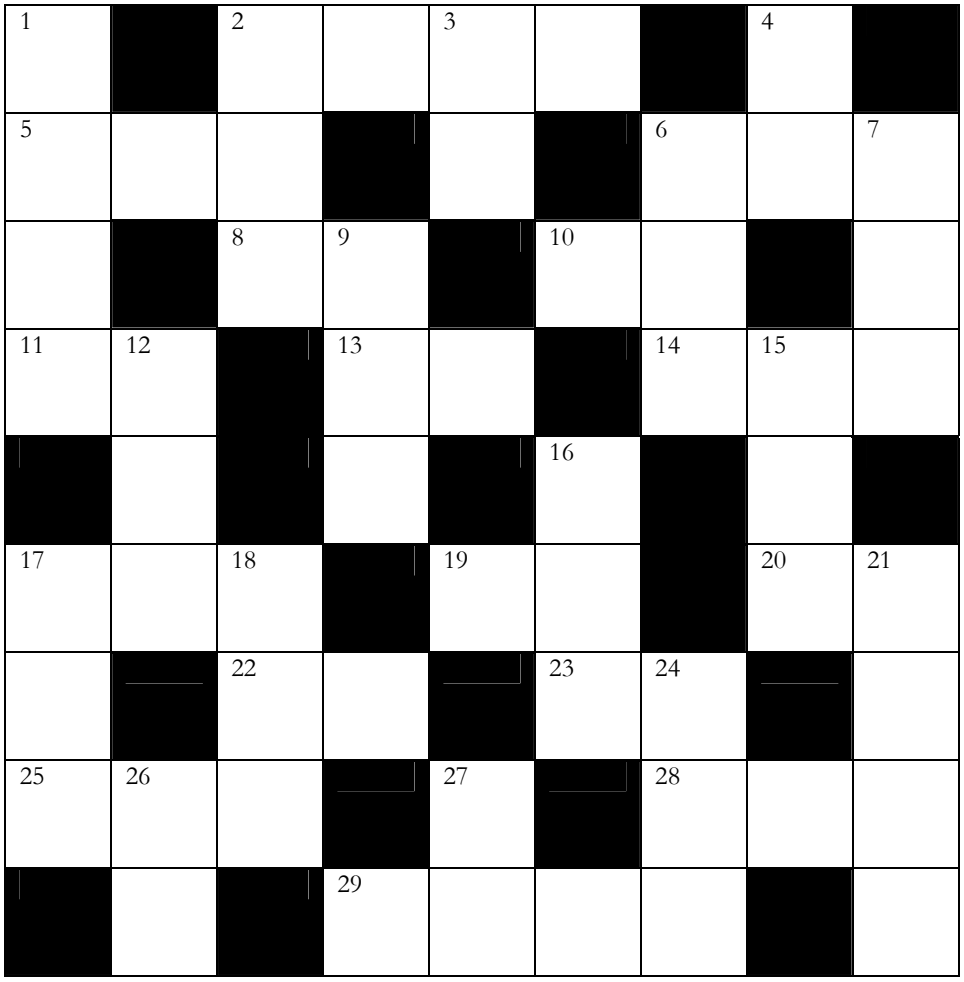
CROSS NUMBER



Across:

2 A power of two (4)
5 A prime factor of 12345 (3)
6 Six more than a multiple of 13 Across (3)
8 A cube number (2)
10 The product of the digits of 25 Across and also less than half of 23 Across (2)
11 The mean of 4 Down, 8 Across, 10 Across, 13 Across and 20 Across, and more than 3 Down (2)
13 A Fibonacci number (2)
14 A multiple of seven (3)
17 Eight less than a square number (3)
19 Seven less than 26 Down (2)
20 A number that is greater than 3 Down and less than 27 Down (2)
22 An even number which is the sum of a square and a triangle number in two different ways (2)
23 A prime number whose digits add up to five (2)
25 A square number and a multiple of five (3)
28 A multiple of 14 which includes a two and an eight amongst its digits (3)
29 Nine more than a power of 20 Across (4)

Down:

1 One hundred and ninety-five less than a square number (4)
2 One less than a Fibonacci number (3)
3 Highest common factor of 9 Down and 15 Down (2)
4 The sum of two powers of two (2)
6 (25 Across) percent of 24 Down (3)
7 The shortest side of a right-angled triangle whose longer sides are 24 Down and 25 Across (3)
9 The square of a triangle number and one less than a multiple of five (3)
12 A factor of 732, each of whose digits are powers of two (3)
15 Five multiplied by 3 Down (3)
16 An even square number and multiple of 8 Across (3)
17 A multiple of 17, the product of whose digits is a square number multiplied by seven (3)
18 A multiple of nine (3)
21 A power of 21 (4)
24 A factor of 360 (3)
26 Seven more than 19 Across (2)
27 A cube number (2)

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CROSS NUMBER

Completed Grid

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

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.

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RELAY score sheet

Team number ……. **School name ……..**

A1		$\frac{1}{2009}$	**B8**		0.125 or $\frac{1}{8}$ cm/s
B1		127	**A9**		(4, 1)
A2		500 seconds	**B9**		80 minutes
B2		13 feet	**A10**		30°
A3		$\frac{1}{143}$	**B10**		1015
B3		7	**A11**		1300 m
A4		£29	**B11**		10
B4		2010.5	**A12**		50
A5		12 minutes	**B12**		539π cm^3
B5		9 km/h	**A13**		11 years
A6		$10000 + 2500\pi$ m^2	**B13**		190
B6		6	**A14**		$\frac{11}{100}$ or 0.11
A7		73	**B14**		3
B7		144°	**A15**		1234567890
A8		102	**B15**		$\frac{1}{8}$

Correct answers score 2 points: TOTAL SCORE = _____

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GROUP ANSWERS

1. Number of other ways tile may be painted 23	**2.** Average speed $2\frac{2}{3}$ or $\frac{8}{3}$ miles per hour
3. 1000th letter d	**4.** Time 0 5 2 0
5. Number of sides 20	**6.** Number of students 59
7. Alberta's age 52	**8.** Number of teenagers 11
9. Larger of two primes whose sum is 12345 12343	**10.** Number of nuts 56

Award 6 points for each correct answer.

TOTAL SCORE = _____