UKMT Team Maths Challenge 2008

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 2008

HEAD TO HEAD score sheet

Team number ……. School name ……..

Put a mark in the next empty box for each correct answer – 1 point per correct answer.
Total = number of correct answers.

ROUND 1

TOTAL

ROUND 2

TOTAL

ROUND 3

TOTAL

ROUND 4

TOTAL

ROUND 5

TOTAL

ROUND 6

TOTAL

GRAND TOTAL _____.

UKMT Team Maths Challenge 2008

HEAD TO HEAD answers

Round 1. $y = 9x - 5$

x	4	3	2	10	200	–3	15	–5	13	2.5	12	–11
y	31	22	**13**	**85**	**1795**	**–32**	**130**	**–50**	**112**	**17.5**	**103**	**–104**

Round 2. This time the answer you find depends on the two numbers you are given.
$z = 3x + 2y$

x	1	2	1	3	5	1	8	4	12	–7	22	–5
y	2	1	0	2	1	3	–1	3	3	10	22	–6
z	7	8	**3**	**13**	**17**	**9**	**22**	**18**	**42**	**–1**	**110**	**–27**

Round 3. $y = x(x + 3)$

x	5	6	8	–4	11	–1	0	–7	17	–13	–3	9
y	40	54	**88**	**4**	**154**	**–2**	**0**	**28**	**340**	**130**	**0**	**108**

Round 4. $y = 5 - x^2$

x	4	5	–4	1	3	0	–12	15	–13	1.1	16	1.5
y	–11	–20	**–11**	**4**	**–4**	**5**	**–139**	**–220**	**–164**	**3.79**	**–251**	**2.75**

Round 5. $y = 3 \times$ (product of the digits of x)

x	20	26	2	15	23	102	123	345	85	72	67	5214
y	0	36	**6**	**15**	**18**	**0**	**18**	**180**	**120**	**42**	**126**	**120**

Round 6. y = largest integer $\leq \sqrt{x}$

x	6	4	3	10	16	19	29	25	40	48	1	101
y	2	2	**1**	**3**	**4**	**4**	**5**	**5**	**6**	**6**	**1**	**10**

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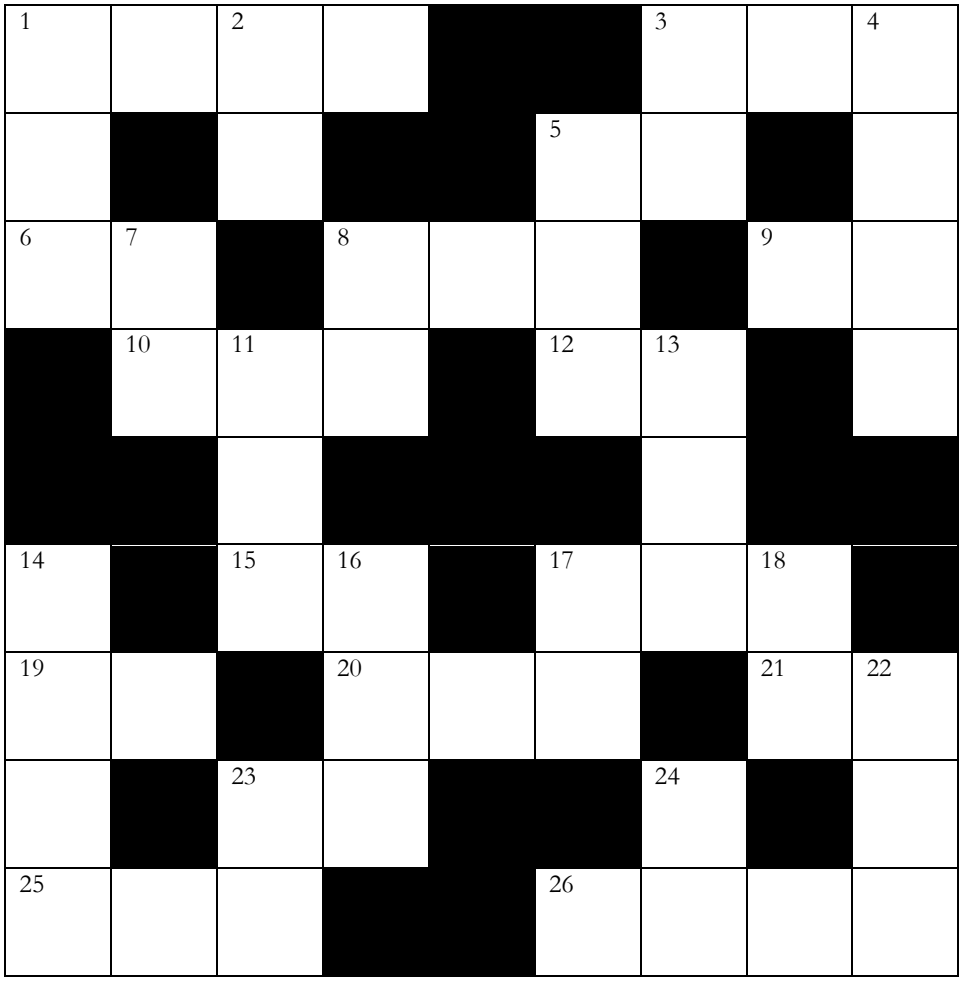
CROSS NUMBER



Across:

1. Difference between 26 Across and 25 Across
3. Prime factor of 9876
5. Prime number
6 Multiple of three
8 Multiple of 8 Down
9 Five more than a square number
10 Prime number multiplied by 5 Across
12 Four more than a cube number
15 Seven less than a multiple of twenty-two
17 Prime number that is one more than a fourth power
19 Prime number two less than a multiple of seven
20 One less than half the product of 6 Across and 7 Down
21 The sum of 5 Across, 8 Down and 9 Across minus a factor of 2 Down
23 A power of two added to 19 Across
25 Odd square number that is three more than a multiple of eleven
26 Number with distinct positive even digits, and with exactly four factors, whose first digit is two

Down:

1 Square of a triangular number
2 Square root of 4 Down
3 Seven less than the exterior angle of a regular polygon
4 An even number which is the square of 2 Down and whose digits add up to a square number
5 Prime Fibonacci number, each of whose digits is also a Fibonacci number
7 Two less than a square number
8 Factor of 24 Down
11 Palindromic multiple of eleven whose digits add up to one more than a factor of eleven
13 Sum of two consecutive square numbers
14 Twice a power of seven
16 Prime number multiplied by 8 Down
17 One more than a square number
18 19 Across minus a power of ten
22 Multiple of eleven
23 One less than a multiple of four
24 The square of a prime multiplied by a prime

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CROSS NUMBER

Completed Grid

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

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RELAY score sheet

Team number ……. School name ……..

A1	2	B8	72 (°)
B1	30 (seconds)	A9	(£) 600
A2	96	B9	7π (cm^2)
B2	15 (°)	A10	3
A3	3 (minutes)	B10	$\frac{10}{64} = \frac{5}{32}$
B3	136	A11	$\frac{5}{16}$
A4	132 (°)	B11	61 (p)
B4	20	A12	96π (cm^3)
A5	$\frac{1}{3}$	B12	15 (hours)
B5	20 (m)	A13	30 (cm)
A6	75	B13	22 (%)
B6	(£) 165	A14	210 (minutes)
A7	11	B14	(12, 29)
B7	3	A15	£4.20 or 420p
A8	$\frac{10}{216} = \frac{5}{108}$	B15	397 (days)

Correct answers score 2 points: TOTAL SCORE = _____

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GROUP ANSWERS

1. Time 3½ h *or* 3 h 30 m *or* 210 m	***2.*** Words in ascending order **ONE, FIVE, THREE, TWO, FOUR**
3. Number of triangles 35	***4.*** Probability as a fraction in its lowest terms 5/18
5. Number of golds 6	***6.*** Surface area 272 cm^2
7. Time to fill container 24 seconds	***8.*** Last digit 2
9. Angle EAF 21 degrees	***10.*** Last page number 137

Award 6 points for each correct answer.

TOTAL SCORE = _____