



UKMT Team Maths Challenge 2013

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.

Please ensure that students use blue or black ink to write their answers; teachers are asked to use red ink for marking.



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MINI RELAY ANSWERS

A1	15
A2	4
A3	54
A4	49

B1	6
B2	10
B3	20
B4	70

C1	9
C2	30
C3	150
C4	15

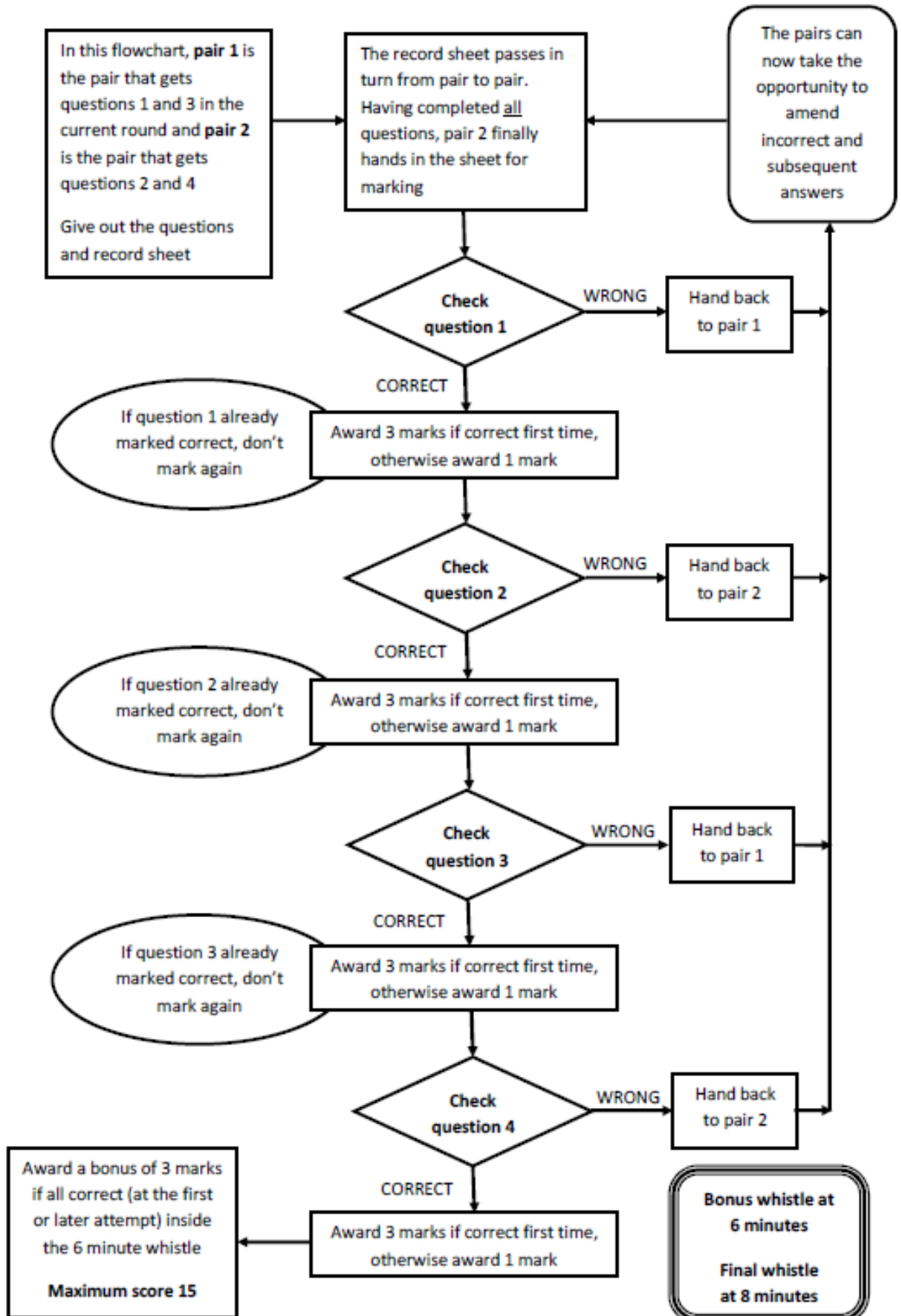
D1	18
D2	144
D3	1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$
D4	120p

On the students' answer sheet please circle the mark awarded for each part of the question (either 3, 1 or 0)

The flowchart opposite explains the order in which questions should be marked.



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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		

Across

- The mean of 12 Across, 12 Down and 1 Across (3)
- The square of one less than 9 Down (4)
- A factor of 8 Down (2)
- The solution to $\frac{x+1}{3} + \frac{x-9}{5} = 30$ (2)
- The remainder when 8 Down is divided by 91 (2)
- $12^2 + 4^2 + 2^2 + 1^2$ (3)
- The sum of 9 Down and 25 Down (2)
- Half of 13 Down (3)
- Twice 19 Down (3)
- An interior angle of an isosceles triangle with one angle equal to 26 Across (2)
- A multiple of 11 (3)
- A consecutive prime to 19 Down (2)
- The sum of all its factors is 28 (2)
- The sum of 4 Down and 9 Down (2)
- The value of $(x + 1)(2x + 1)$ when $x = 49$ (4)
- The area of a triangle with base 24 Down and height 25 Down (3)

Down

- The product of 5 Down and 6 Across (4)
- The sum of the digits of this number and the other digits in this column comes to 24 Down (3)
- A perfect number (that is, a number which is the sum of all its factors not including itself) (2)
- A Fibonacci number (2)
- The largest three digit square number (3)
- A square number that is also a triangular number (2)
- A quarter of 13 Down (3)
- Two more than 12 Across (3)
- A cube number (3)
- Twenty less than double the sum of 11 Down and 15 Across (3)
- An odd multiple of 12 Down (3)
- A prime number (2)
- The number of minutes in 12 Across hours (4)
- A square whose digits sum to a square (3)
- The value of $\frac{10 \times 8 \times 6 \times 4 \times 2}{2 \times 2 \times 2 \times 2 \times 2 \times 5}$ (2)
- The square root of 3 Across (2)



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Completed Grid

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

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**

Correct answers score 2 points – circle 2 or 0 for each question and cross out the other number. Cross out both marks for any question not reached by the end of the round.

A1	2 / 0	294 (cm ²)	B8	2 / 0	(4, -5)
B1	2 / 0	5	A9	2 / 0	11, 13
A2	2 / 0	10:50	B9	2 / 0	1432
B2	2 / 0	40	A10	2 / 0	29
A3	2 / 0	6	B10	2 / 0	196 (cm ²)
B3	2 / 0	17	A11	2 / 0	North (allow N or 0 degrees)
A4	2 / 0	220	B11	2 / 0	7
B4	2 / 0	30 (mins)	A12	2 / 0	1
A5	2 / 0	11	B12	2 / 0	64 (cm)
B5	2 / 0	420 (ml)	A13	2 / 0	5
A6	2 / 0	38	B13	2 / 0	South (allow S or 180 degrees)
B6	2 / 0	25	A14	2 / 0	14°
A7	2 / 0	3 : 14	B14	2 / 0	1800
B7	2 / 0	4, 7, 9	A15	2 / 0	Bottom line KMTU
A8	2 / 0	144.5 (cm ²)	B15	2 / 0	4

TOTAL SCORE = _____



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GROUP ANSWERS

1. 35 <input type="text" value="6 or 0"/>	2. 55 mph <input type="text" value="6 or 0"/>
3. 1007 <input type="text" value="6 or 0"/>	4. 25 <input type="text" value="6 or 0"/>
5. 20 <input type="text" value="6 or 0"/>	6. 384 <input type="text" value="6 or 0"/>
7. £40 <input type="text" value="6 or 0"/>	8. 18 <input type="text" value="6 or 0"/>
9. 864 (cm ²) <input type="text" value="6 or 0"/>	10. £200 <input type="text" value="6 or 0"/>

Award 6 points for each correct answer on the Team Answer Sheet.



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