

TEAM MATHS CHALLENGE  
2014

NATIONAL FINAL

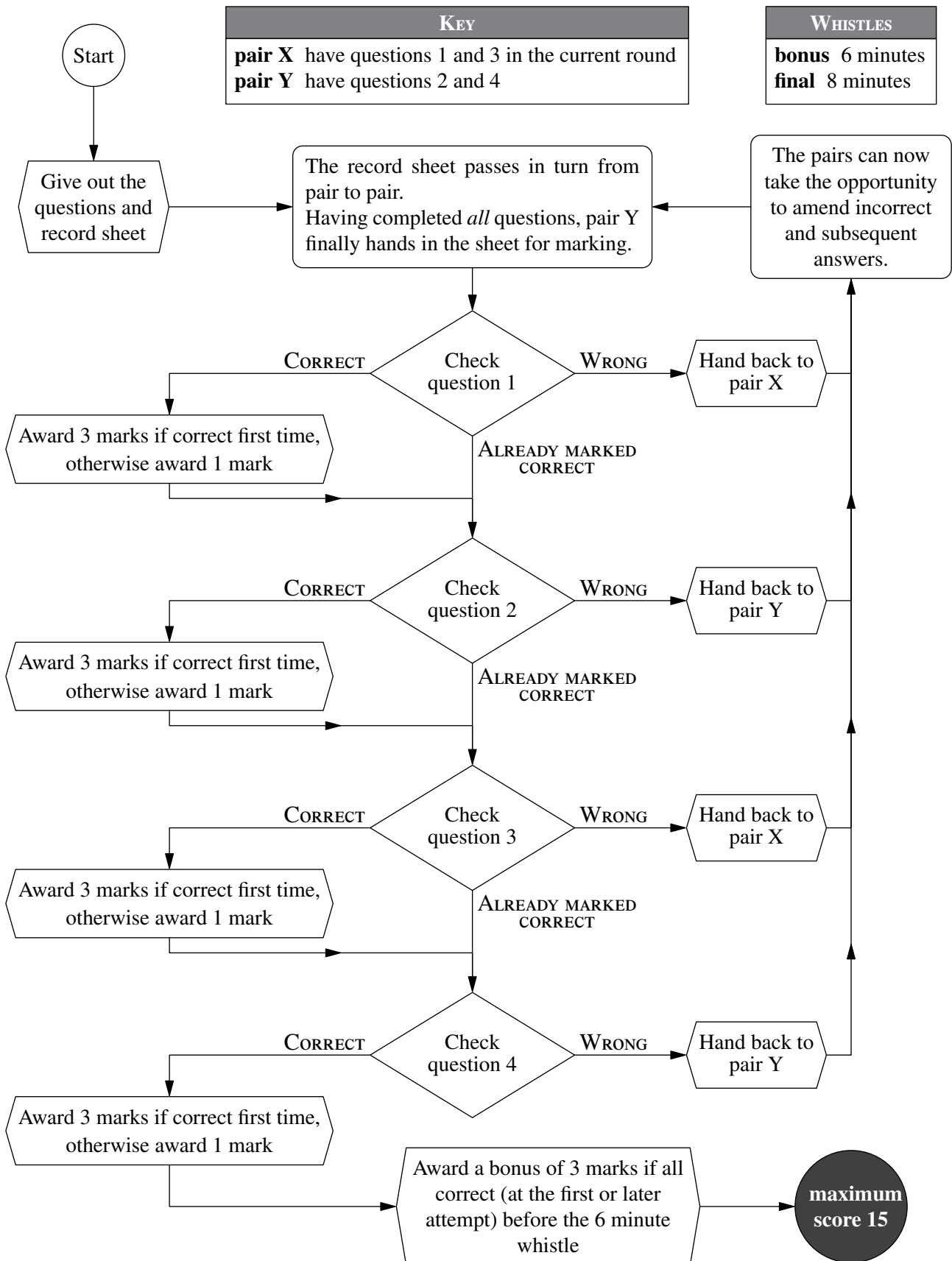
## SUPERVISOR'S BOOKLET

Please ensure that students do not have access to this booklet, and take care to hold it so that answers cannot be seen.

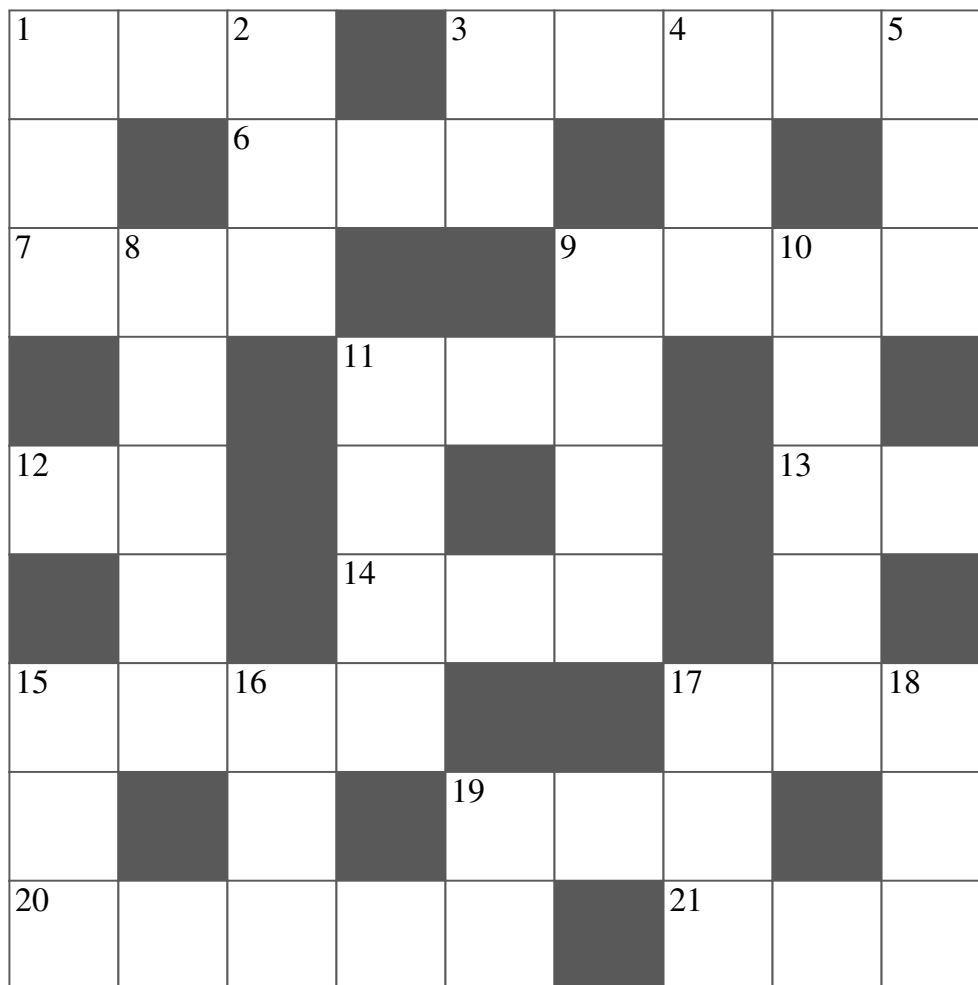
Please ensure that students use blue or black ink to write their answers; teachers are asked to use red ink for marking.



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



# CROSSNUMBER



## ACROSS

1. Nine less than 4 DOWN (3)
3. 15 ACROSS plus 20 ACROSS plus 2 DOWN (5)
6. A Fibonacci number (3)
7. A multiple of seven (3)
9. 1 ACROSS multiplied by ten plus a square number (4)
11. The product of 19 DOWN and the square root of 6 ACROSS (3)
12. The sum of the digits in the first column (2)
13. 18 DOWN minus seventeen (2)
14. The sum of the cubes of its digits (3)
15. 88 squared (4)
17. 19 ACROSS minus 13 ACROSS (3)
19. The product  $ab$  where  $a$  and  $b$  are integer solutions of  $5a + 7b = 223$  (3)
20.  $(3^3 + 4^4 + 3^3 + 5^5) \times 10$  (5)
21. 6 ACROSS plus the square of 19 DOWN (3)

## DOWN

1. The mean of 4 DOWN and 11 ACROSS (3)
2. A multiple of nine (3)
3. A multiple of eleven (2)
4. The product of the first four prime numbers (3)
5. 6 ACROSS minus twice 19 DOWN (3)
8.  $2^{2^4} + 1$  (*the 5th Fermat number*) (5)
9. The product of three primes (not all different) that have the same units digit (4)
10. Multiply this number by nine and you will have reversed it! (5)
11. The mean of 9 ACROSS and 11 DOWN (4)
15. 840 minus 13 ACROSS (3)
16. 17 DOWN plus 19 ACROSS (3)
17. The product of its digits is 40 (3)
18. Seventeen more than a prime (3)
19. Five more than the square root of 1 DOWN (2)

## CROSSNUMBER

<sup>1</sup> 2	0	<sup>2</sup> 1		<sup>3</sup> 4	2	<sup>4</sup> 2	1	<sup>5</sup> 1
2		<sup>6</sup> 1	4	4		1		0
<sup>7</sup> 5	<sup>8</sup> 6	7			<sup>9</sup> 2	0	<sup>10</sup> 1	4
	5		<sup>11</sup> 2	4	0		0	
<sup>12</sup> 2	5		0		2		<sup>13</sup> 9	7
	3		<sup>14</sup> 1	5	3		8	
<sup>15</sup> 7	7	<sup>16</sup> 4	4			<sup>17</sup> 1	9	<sup>18</sup> 1
4		7		<sup>19</sup> 2	8	8		1
<sup>20</sup> 3	4	3	5	0		<sup>21</sup> 5	4	4

### Marking Instructions—a reminder

- Pairs may only communicate through the teacher, and only to request that the other pair works 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, place a tick in the dotted circle and award one mark
  - if it is wrong, cross it out, write in the correct digit, and place a cross in the dotted circle
  - 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.

**Station 1**

7

**Station 5**

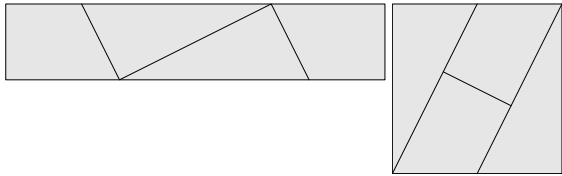
192

points

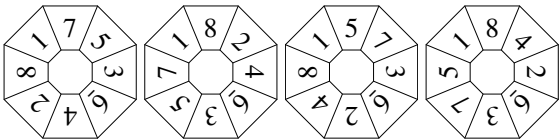
**Station 2**

A2

**Station 6**



**Station 3**



**Station 7**

$123 - 45 - 67 + 89$

**Station 4**

126

**Station 8**

10

On the RESPONSE SHEET:

Circle the mark awarded for each question and cross out the others.

TEAM NUMBER  SCHOOL NAME

<b>A1</b> 108 <input type="radio"/> 0 <input type="radio"/> 2	<b>A6</b> (4, 7) <input type="radio"/> 0 <input type="radio"/> 2	<b>A11</b> 35 mpg <input type="radio"/> 0 <input type="radio"/> 2
<b>B1</b> 150 <input type="radio"/> 0 <input type="radio"/> 2	<b>B6</b> 16 <input type="radio"/> 0 <input type="radio"/> 2	<b>B11</b> 10 £ <input type="radio"/> 0 <input type="radio"/> 2
<b>A2</b> 74.75 or $74\frac{3}{4}$ <input type="radio"/> 0 <input type="radio"/> 2	<b>A7</b> 12 <input type="radio"/> 0 <input type="radio"/> 2	<b>A12</b> 2.5 or $2\frac{1}{2}$ cm <sup>2</sup> <input type="radio"/> 0 <input type="radio"/> 2
<b>B2</b> (0, 3) <input type="radio"/> 0 <input type="radio"/> 2	<b>B7</b> 5 <input type="radio"/> 0 <input type="radio"/> 2	<b>B12</b> 73.5 or $73\frac{1}{2}$ ° <input type="radio"/> 0 <input type="radio"/> 2
<b>A3</b> 6 mins <input type="radio"/> 0 <input type="radio"/> 2	<b>A8</b> 1 <input type="radio"/> 0 <input type="radio"/> 2	<b>A13</b> 27 p <input type="radio"/> 0 <input type="radio"/> 2
<b>B3</b> 48 <input type="radio"/> 0 <input type="radio"/> 2	<b>B8</b> (9, 2) <input type="radio"/> 0 <input type="radio"/> 2	<b>B13</b> 1.3 cm <input type="radio"/> 0 <input type="radio"/> 2
<b>A4</b> 16 <input type="radio"/> 0 <input type="radio"/> 2	<b>A9</b> 6006 <input type="radio"/> 0 <input type="radio"/> 2	<b>A14</b> $\frac{4}{9}$ <input type="radio"/> 0 <input type="radio"/> 2
<b>B4</b> 12 mins <input type="radio"/> 0 <input type="radio"/> 2	<b>B9</b> 20 <input type="radio"/> 0 <input type="radio"/> 2	<b>B14</b> 23 <input type="radio"/> 0 <input type="radio"/> 2
<b>A5</b> 19 hours <input type="radio"/> 0 <input type="radio"/> 2	<b>A10</b> 9 <input type="radio"/> 0 <input type="radio"/> 2	<b>A15</b> 2452 <input type="radio"/> 0 <input type="radio"/> 2
<b>B5</b> 35 <input type="radio"/> 0 <input type="radio"/> 2	<b>B10</b> 4:1 <input type="radio"/> 0 <input type="radio"/> 2	<b>B15</b> 5 <input type="radio"/> 0 <input type="radio"/> 2

Correct answers score 2 points: circle 2 or 0 for each question and cross out the other number.  
At the end of the round, draw a line under the last question attempted.

FINAL SCORE /60

BACK

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