

TEAM MATHS CHALLENGE  
2015

REGIONAL 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.

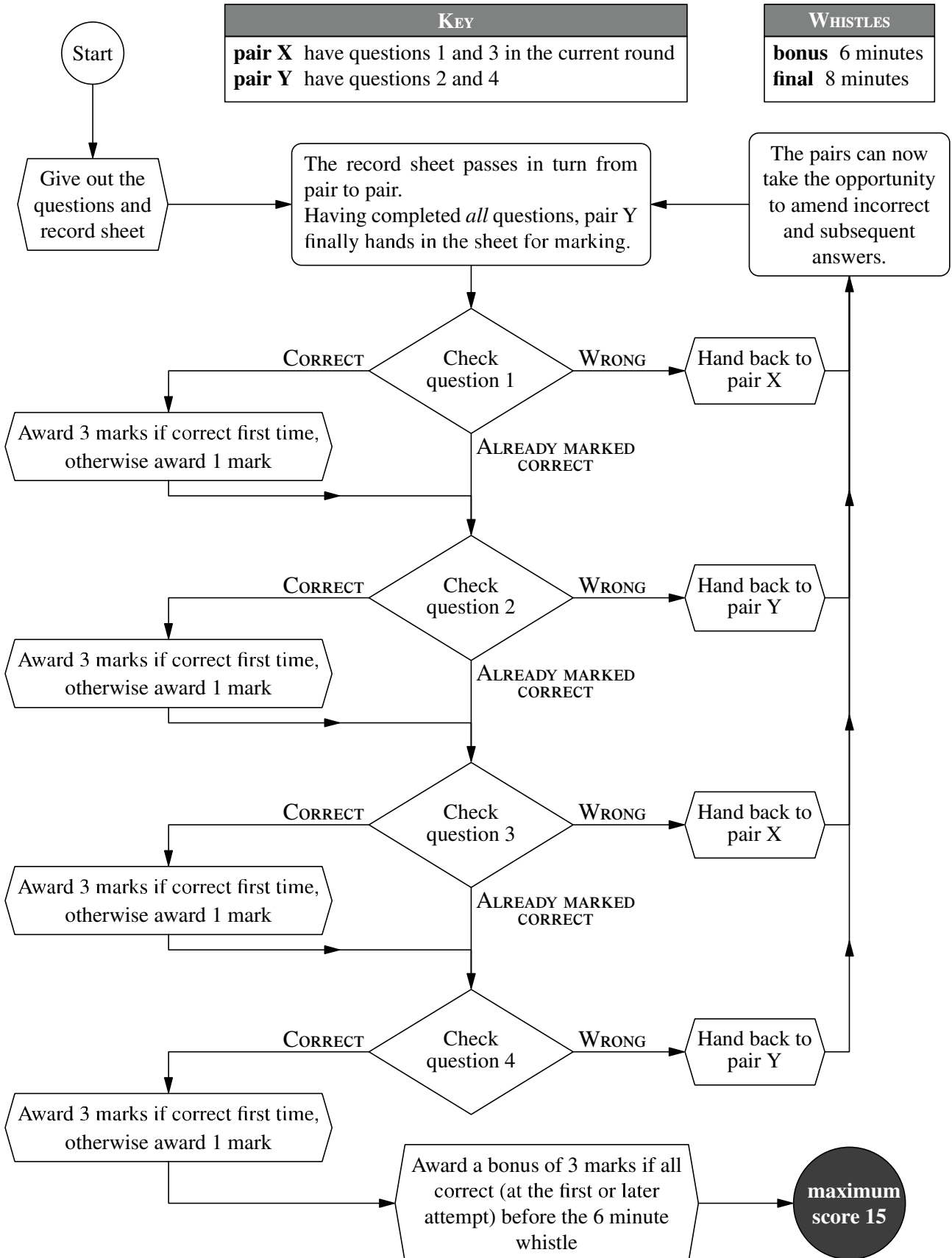
Please ensure that students use blue or black ink to write their answers; teachers are asked to use red ink for marking.

<b>A1</b>  8	<b>B1</b>  6	<b>C1</b>  48	<b>D1</b>  9
<b>A2</b>  576	<b>B2</b>  12	<b>C2</b>  54	<b>D2</b>  2
<b>A3</b>  24	<b>B3</b>  50	<b>C3</b>  15	<b>D3</b>  120
<b>A4</b>  360	<b>B4</b>  3750	<b>C4</b>  6	<b>D4</b>  67

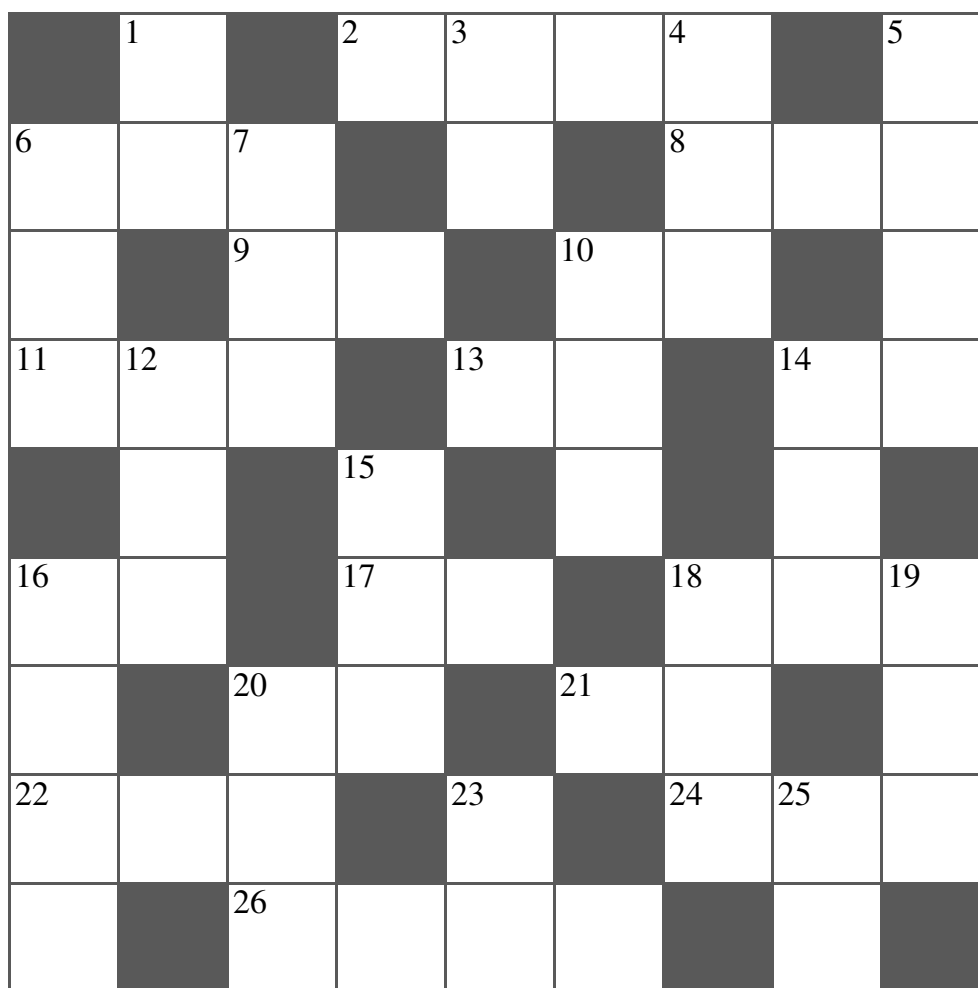
On the RESPONSE SHEET:

Circle the mark awarded for each question and cross out the others.  
At the end of the round, either circle the bonus mark or cross it out.

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



# CROSSNUMBER



## ACROSS

2. The smallest 4-digit palindromic cube (4)
6. A square plus its square root (3)
8. A number equal to the sum of the cubes of its digits (3)
9.  $\sqrt{13^2 - 5^2}$  (2)
10. A factor of 10 DOWN (2)
11. The remainder when 26 ACROSS is divided by 22 ACROSS (3)
13. Four more than 1 DOWN (2)
14. A multiple of 17 ACROSS (2)
16. The square of a prime factor of 2015 (2)
17. The highest common factor of 26 ACROSS and 2015 (2)
18. 14 ACROSS plus 25 DOWN (3)
20. A Fibonacci number (2)
21. 23 DOWN plus a non-trivial factor of 18 DOWN (2)
22. A multiple of 23 DOWN (3)
24.  $x$  where  $4 = 5(x - 2) - 26$  ACROSS (3)
26. 6 ACROSS plus 15 DOWN (4)

## DOWN

1. The largest prime factor of 2015 (2)
3. A multiple of 9 ACROSS (2)
4. A Fibonacci number (3)
5.  $9^3 + 10^3$  or  $12^3 + 1^3$  (4)
6. The sum of its digits multiplied by an even number (3)
7. A cube (3)
10. A multiple of 10 ACROSS (3)
12. The product of 13 ACROSS and 16 ACROSS (3)
14. A number equal to the sum of the cubes of its digits (3)
15. The mean of 6 ACROSS and 7 DOWN (3)
16. 2 ACROSS plus 26 ACROSS (4)
18. A multiple of 11 (3)
19. 14 DOWN minus 9 ACROSS (3)
20. A number that makes the sum of the six digits in its column equal to 17 ACROSS (3)
23. The product of 17 ACROSS and a square (2)
25. Both a square and a cube (2)

## CROSSNUMBER

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

**1.** Difference in ages

20

months

**6.** Average walking speed

3

mph

**2.** (a) sum of 3 primes (b) sum of 3 primes

(a) 25  
(b) 71

**7.** Percentage who enjoyed both

10

%

**3.** (a) decoded message (b) decoded message

(a) HOW ARE YOU  
(b) VERY WELL THANKS

**8.** Original number

52

**4.** Value of  $\angle ABE$

90

degrees

**9.** (a)  $a : b$  (b) the ratio of the areas

(a) 2 : 1  
(b) 3 : 8

**5.** Value of  $a + b + c$

9

**10.** Brother's age

25

years

On the RESPONSE SHEET:

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

TEAM NUMBER  SCHOOL NAME

<b>A1</b> $\frac{3}{10}$ 0 2	<b>A6</b> 32.2 or $32\frac{1}{5}$ or $\frac{161}{5}$ 0 2	<b>A11</b> 3.4 g 0 2
<b>B1</b> 120 0 2	<b>B6</b> mogs, mags, migs 0 2	<b>B11</b> $(4\frac{1}{2}, 9)$ or $(4.5, 9)$ or $(\frac{9}{2}, 9)$ 0 2
<b>A2</b> 350 gallons 0 2	<b>A7</b> 64 $\text{cm}^2$ 0 2	<b>A12</b> 294 0 2
<b>B2</b> 60 0 2	<b>B7</b> 4 0 2	<b>B12</b> 315 ° 0 2
<b>A3</b> 1.65 kg 0 2	<b>A8</b> 110 ° 0 2	<b>A13</b> $37.5$ or $37\frac{1}{2}$ or $\frac{75}{2}$ ° 0 2
<b>B3</b> 288 0 2	<b>B8</b> 19 0 2	<b>B13</b> $\frac{13}{60}$ 0 2
<b>A4</b> 3 0 2	<b>A9</b> zogs, zags, zigs 0 2	<b>A14</b> 27.04 $\text{m}^2$ 0 2
<b>B4</b> 50 ° 0 2	<b>B9</b> 3 0 2	<b>B14</b> 336 0 2
<b>A5</b> 11 0 2	<b>A10</b> 48 0 2	<b>A15</b> $(1, -1)$ 0 2
<b>B5</b> 4 g 0 2	<b>B10</b> 225 $\text{cm}^2$ 0 2	<b>B15</b> 52.8 mph 0 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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