

TEAM MATHS CHALLENGE  
2017

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.

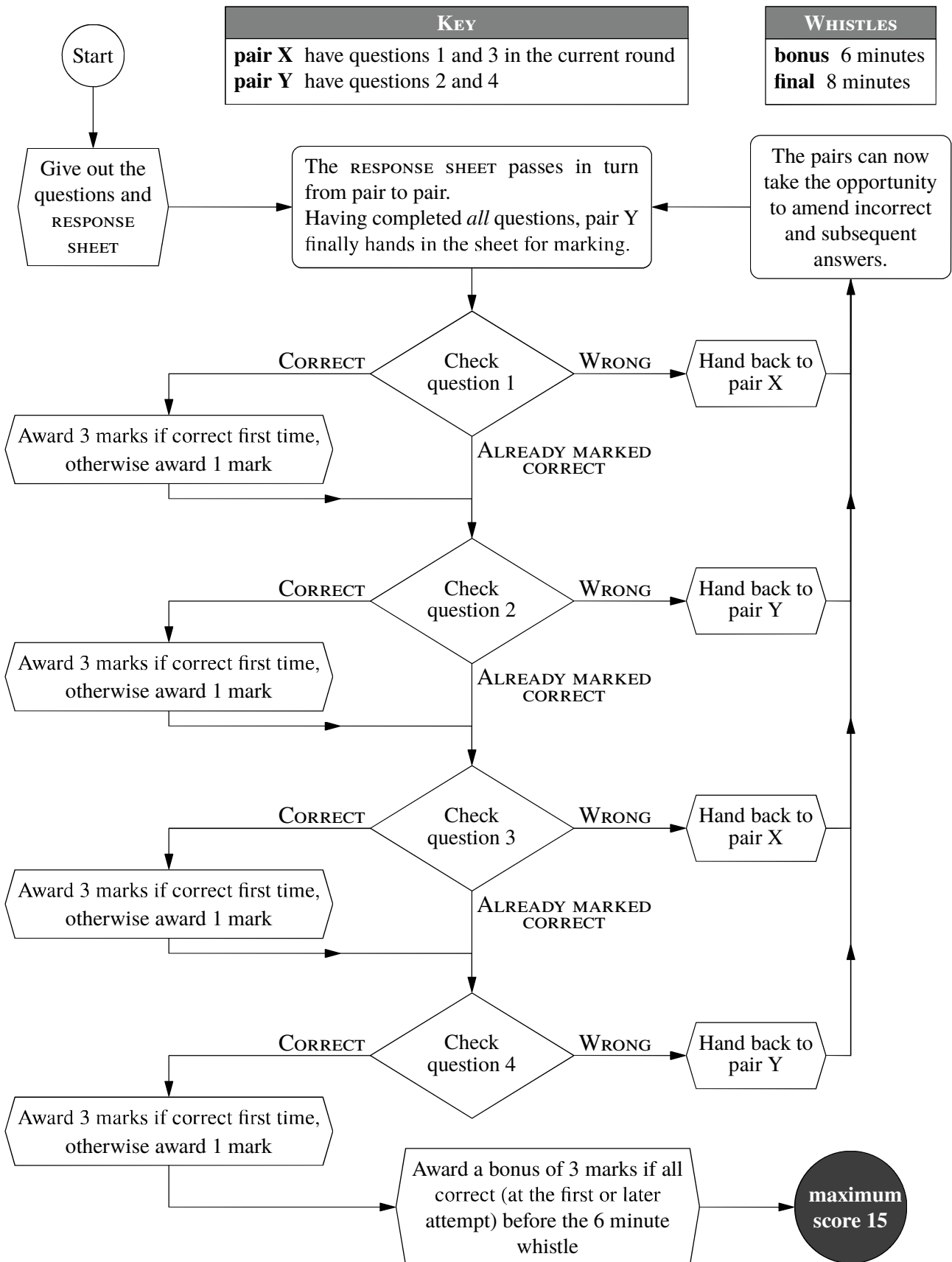
Please ensure that students use blue or black ink to write their answers; teachers are asked to use red ink for marking.

<b>A1</b>  11	<b>B1</b>  6	<b>C1</b>  120	<b>D1</b>  8
<b>A2</b>  8	<b>B2</b>  5	<b>C2</b>  60	<b>D2</b>  2
<b>A3</b>  120	<b>B3</b>  800	<b>C3</b>  64	<b>D3</b>  1024
<b>A4</b>  4200	<b>B4</b>  20	<b>C4</b>  16	<b>D4</b>  511

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

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				29		

## ACROSS

- 29 ACROSS plus 4 DOWN (3)
- The sum of the first twelve prime numbers (3)
- $77 \times \frac{7 \text{ DOWN}}{2}$  (3)
- This number is a multiple of the sum of its digits (3)
- The sum of the digits of this number is a factor of 10 DOWN (2)
- A non-square factor of 16 DOWN (2)
- A palindromic number (4)
- 3 DOWN plus five (2)
- Twice a square (2)
- $9 \times 8 \times 7 \times (6 - 5 + 4 - 3) \times 2 + 1$  (4)
- $x$ , where  $\frac{5 \text{ DOWN} - 2}{x} = 70 - 22 \text{ ACROSS}$  (2)
- A factor of 23 DOWN (2)
- The mean of 16 DOWN and 24 ACROSS (3)
- The largest three-digit number that is the sum of a Fibonacci number and a square (3)
- The sum of its digits is 8 (3)
- $y$  where  $1 : 20 = 2 \text{ DOWN} : y$  (3)

## DOWN

- The product of the first five odd numbers (3)
- $x$  where  $10 \text{ DOWN} : x = 72 : 1$  (2)
- A factor of 12 ACROSS (2)
- An angle, in degrees, of an isosceles triangle that contains a  $53^\circ$  angle (2)
- The factor of 26 ACROSS whose digits add to 8 (3)
- Twice 6 ACROSS  $\div 77$  (2)
- A multiple of the sum of the digits of 9 ACROSS (4)
- $\frac{14 \text{ DOWN} + 18 \text{ ACROSS}}{6}$  (3)
- $(3 + 1 \times 2)^5$  (4)
- A power of 2 (3)
- A prime number of the form  $n^n + 1$  (3)
- The mean of 2 DOWN and 12 ACROSS (2)
- A multiple of 22 ACROSS (3)
- $x$ , where  $x + 79 = 5 \text{ DOWN} - 10x$  (2)
- A multiple of 5 that is the sum of two different squares (2)
- The remainder when 26 ACROSS is divided by 103 (2)

## CROSSNUMBER

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

### 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.

$$\frac{1}{3}$$

6.

$$5$$

2.

(a) 4 (b) 2

7.

$$2$$

miles

3.

(a) 16 (b) 23

8.

$$4356$$

4.

$$10$$

9.

(a) 7 (b) 10

5.

$$11$$

10.

$$12$$

On the RESPONSE SHEET:

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

TEAM NUMBER  SCHOOL NAME

<b>A1</b> (5, 4) <input type="radio"/> 0 <input type="radio"/> 2	<b>A6</b> 17.5 or $17\frac{1}{2}$ <input type="radio"/> 0 <input type="radio"/> 2	<b>A11</b> 3 June <input type="radio"/> 0 <input type="radio"/> 2
<b>B1</b> £7.76 £ <input type="radio"/> 0 <input type="radio"/> 2	<b>B6</b> (20, -20) <input type="radio"/> 0 <input type="radio"/> 2	<b>B11</b> 634 <input type="radio"/> 0 <input type="radio"/> 2
<b>A2</b> $12\frac{1}{2}$ OR 12.5 % <input type="radio"/> 0 <input type="radio"/> 2	<b>A7</b> 330 ° <input type="radio"/> 0 <input type="radio"/> 2	<b>A12</b> 14 <input type="radio"/> 0 <input type="radio"/> 2
<b>B2</b> 10.5 or $10\frac{1}{2}$ <input type="radio"/> 0 <input type="radio"/> 2	<b>B7</b> 108 cm <sup>3</sup> <input type="radio"/> 0 <input type="radio"/> 2	<b>B12</b> -3 <input type="radio"/> 0 <input type="radio"/> 2
<b>A3</b> 2 <input type="radio"/> 0 <input type="radio"/> 2	<b>A8</b> 289 m <sup>2</sup> <input type="radio"/> 0 <input type="radio"/> 2	<b>A13</b> 4 <input type="radio"/> 0 <input type="radio"/> 2
<b>B3</b> 438 hours <input type="radio"/> 0 <input type="radio"/> 2	<b>B8</b> 37.5 OR $37\frac{1}{2}$ <input type="radio"/> 0 <input type="radio"/> 2	<b>B13</b> $2\frac{1}{3}$ OR 2. $\dot{3}$ OR $\frac{7}{3}$ <input type="radio"/> 0 <input type="radio"/> 2
<b>A4</b> 15 <input type="radio"/> 0 <input type="radio"/> 2	<b>A9</b> 33 <input type="radio"/> 0 <input type="radio"/> 2	<b>A14</b> 5 <input type="radio"/> 0 <input type="radio"/> 2
<b>B4</b> 15 minutes <input type="radio"/> 0 <input type="radio"/> 2	<b>B9</b> 55 <input type="radio"/> 0 <input type="radio"/> 2	<b>B14</b> 12 <input type="radio"/> 0 <input type="radio"/> 2
<b>A5</b> 7 <input type="radio"/> 0 <input type="radio"/> 2	<b>A10</b> 12.8 OR $12\frac{4}{5}$ % <input type="radio"/> 0 <input type="radio"/> 2	<b>A15</b> 540 m <input type="radio"/> 0 <input type="radio"/> 2
<b>B5</b> 63 <input type="radio"/> 0 <input type="radio"/> 2	<b>B10</b> 50 <input type="radio"/> 0 <input type="radio"/> 2	<b>B15</b> 16 cm <sup>2</sup> <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

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