

**United Kingdom
Mathematics Trust**

TEAM MATHS CHALLENGE
2018

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.

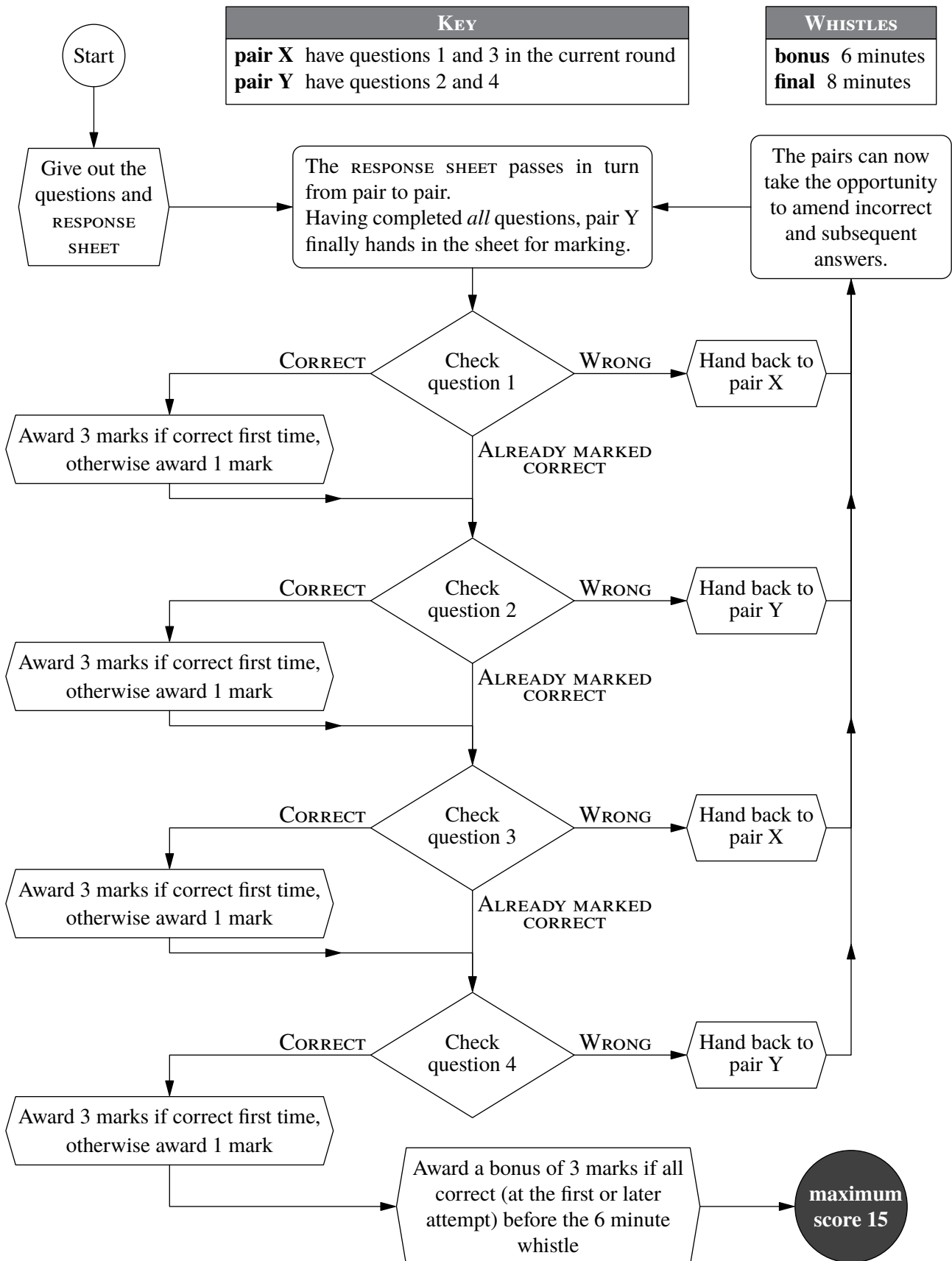
Please ensure that students use blue or black ink to write their answers; teachers are asked to use red ink for marking.

A1 50	B1 4	C1 2	D1 14
A2 80	B2 6	C2 9	D2 20
A3 16	B3 2	C3 1.5 or $1\frac{1}{2}$ or $\frac{3}{2}$	D3 9
A4 44	B4 13	C4 12	D4 9 : 11

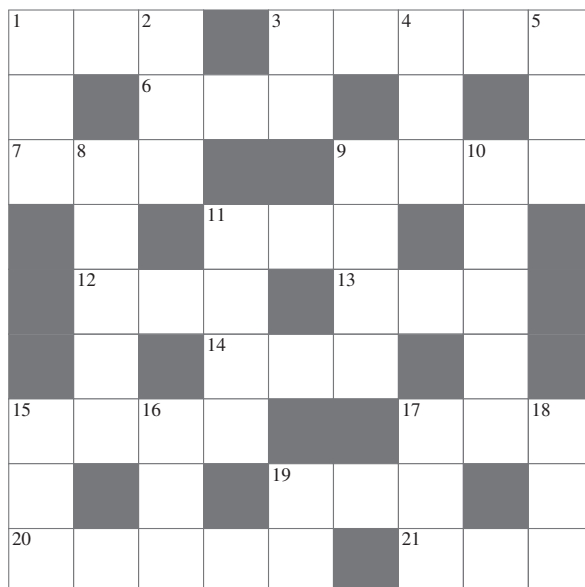
On the RESPONSE SHEET:

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

1. 21 ACROSS minus 3 DOWN (3)
3. The mean of 8 DOWN and 10 DOWN (5)
6. A factor of 9 ACROSS (3)
7. $1! + 4! + 5!$
[Note: When n is a positive integer $n!$ is the product of all the integers from 1 to n . For example, $6! = 1 \times 2 \times 3 \times 4 \times 5 \times 6$.] (3)
9. An odd multiple of 6 ACROSS (4)
11. The size of an interior angle of a regular polygon with 19 DOWN sides (3)
12. The 40th triangular number (3)
13. A multiple of 11 (3)
14. The sum of the divisors of 7 ACROSS (3)
15. A multiple of 2 DOWN, but not a multiple of 3 (4)
17. x , where
 $3 \text{ DOWN} : 12 \text{ ACROSS} = 19 \text{ DOWN} : (x - 51)$ (3)
19. x , where
 $13 \text{ ACROSS} - x = 3x - 7 \times 11 \times 13$ (3)
20. The product of the first six primes (5)
21. The area of a right-angled triangle with longer sides 3 DOWN and 19 DOWN (3)

DOWN

1. A square (3)
2. A factor of 15 ACROSS (3)
3. The sum of the first six primes (2)
4. The sum of the divisors of this number is 1216 (3)
5. x , where
 $3x + 14 \text{ ACROSS} + 35 = 16 \text{ DOWN} - 2x$ (3)
8. A '1' after this number makes it three times larger than when it has a '1' in front of it (5)
9. x , where
 $21 \text{ ACROSS} : 18 \text{ DOWN} = x : 16 \text{ DOWN}$ (4)
10. $4! + 1! + 5! + 8! + 5!$
[Note: When n is a positive integer $n!$ is the product of all the integers from 1 to n . For example, $6! = 1 \times 2 \times 3 \times 4 \times 5 \times 6$.] (5)
11. The smallest four-digit multiple of 7 ACROSS (4)
15. One more than 17 DOWN minus 19 ACROSS (3)
16. 12 ACROSS minus 19 DOWN (3)
17. A multiple of 11 (3)
18. The number of different 5-digit numbers that can be made using every digit of 8 DOWN (3)
19. n , where 12 ACROSS is the n th triangular number (2)

CROSSNUMBER

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

Marking Instructions—a reminder

- Pairs should write their own answers in the Answer Grid; teachers should not do this on their behalf.
- 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, 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
 - show the correct answer 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

(a) 23179 (b) 89731

Station 5

(a)

6	7	8	9	10
2	1	4	3	5

 (b)

1	3	4	5	7
2	9	8	10	6

Station 2

35

Station 6

(a) 1026 (b) 1602

Station 3

(a) 48 (b) 936

Station 7

		1	5
3	7		
	2	8	
6			4

 OR

		1	7
3	5		
	4	8	
6			2

Station 4

(a) 16 (b) 27

Station 8

24

On the RESPONSE SHEET:

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

TEAM NUMBER SCHOOL NAME

A1 $73\frac{1}{2}$ or 73.5 0 2	A6 24 ° 0 2	A11 20 0 2
B1 53 0 2	B6 8 square units 0 2	B11 $\frac{22}{25}$ or 0.88 0 2
A2 10 441 0 2	A7 8 201 820 0 2	A12 3 0 2
B2 $260\frac{1}{2}$ or 260.5 0 2	B7 15 0 2	B12 12 0 2
A3 9 0 2	A8 525 0 2	A13 38 0 2
B3 24 seconds 0 2	B8 $52\frac{1}{2}$ or 52.5 ° 0 2	B13 7 cm 0 2
A4 4 072 000 m ² 0 2	A9 16 square units 0 2	A14 $\frac{1}{6}$ 0 2
B4 $2\frac{3}{10}$ or $\frac{23}{10}$ or 2.3 0 2	B9 30 0 2	B14 101 0 2
A5 10.48 seconds 0 2	A10 $3\frac{3}{5}$ or 3.6 cm 0 2	A15 66 minutes 0 2
B5 12 0 2	B10 30 cm 0 2	B15 5 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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