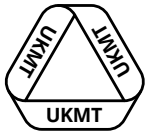


## Instructions

- There are four rounds to this Shuttle Round. Each round contains a set of four questions, and lasts 8 minutes.
- *Three* marks are awarded for every answer correct on the first attempt; *one* mark is awarded if correct on subsequent attempts. A bonus of three marks is awarded if there is a correct set of answers after 6 minutes.
- Your team should split into pairs. One pair will be given questions 1 and 3, and the other pair will be given questions 2 and 4.
- You are not allowed to talk to your other pair except through the supervising teacher.
- Question 1 can be solved independently of the other questions. The answer to this question should be written on the RESPONSE SHEET and passed to your other pair via your supervising teacher. The second pair will need the answer to question 1 to be able to calculate the answer to question 2, although some work can be done on question 2 before the answer to question 1 is received. The answer to question 1 is referred to as  $T$  (for example, “ $T$  is the number you will receive”). The first pair can then do some work on question 3, but will need the answer to question 2 to finalise their answer, and so on.
- Once question 4 has been answered, or if the time is up, hand the RESPONSE SHEET to the supervising teacher for marking.

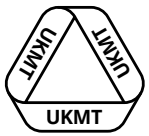


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# A1

Pass on the value of

$$9 - (8 + 7) + (6 + 5) - (4 + 3) + (2 + 1).$$

# A3

*T is the number you will receive.*

Pass on the smallest number that has  $(T - 2)$  factors.

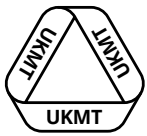


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*T is the number you will receive.*

**A2**

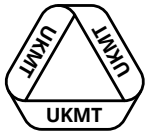
Pass on the value of

$$\frac{1}{3} T \times (T + 1) \times (T + 2) \times (T + 3).$$

*T is the number you will receive.*

**A4**

What is the value of  $(\frac{1}{8} - \frac{1}{9}) T^2$  ?

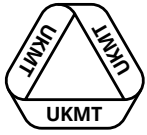


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# B1

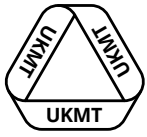
Pass on the value of

$$(4 - 1) \times (5 - 2) \times (6 - 3) \times (7 - 4) + (8 - 5).$$

# B3

*T is the number you will receive.*

Pass on the value of  $\frac{T}{2} + \frac{2T}{3} + \frac{3T}{4} + \frac{7T}{6}$ ?

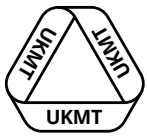


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**B2**

*T is the number you will receive.*

Pass on the smallest square that is a multiple of  $\frac{T}{7}$ .

**B4**

*T is the number you will receive.*

What is the sum of the two prime factors of  $T$ ?

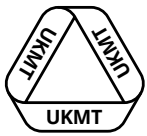


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# C1

Pass on the number of months that start with a letter that isn't at the start of any other month.

# C3

*T is the number you will receive.*

Jo arranged to meet Dennis at the cinema in  $(T - 6)$  hours time.

Jo's watch lost 7 seconds every hour.

Dennis's watch gained 2 seconds every hour.

Pass on how long, in seconds, Dennis had to wait at the cinema for Jo.

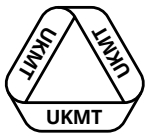


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**C2**

*T* is the number you will receive.

The sum of the  $(T - 1)$  smallest primes equals another prime.

Pass on this prime.

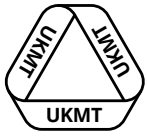
**C4**

*T* is the number you will receive.

A six-sided die is resting on a table such that the number  $\frac{T}{33}$  cannot be seen.

All of the other five numbers can be seen.

What is the sum of the numbers that *can* be seen?

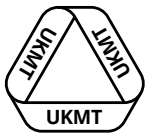


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# D1

Pass on the number of months that end with a letter that isn't at the end of any other month.

# D3

*T is the number you will receive.*

The total surface area of a cube is  $2T$  square centimetres.

Pass on the perimeter of this cube, in centimetres.



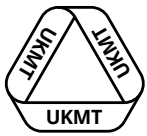


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**D2**

*T is the number you will receive.*

The area of a square is  $9T^2$  square centimetres.

Pass on the perimeter of this square, in centimetres.

**D4**

*T is the number you will receive.*

The total surface of a cube is  $\frac{T}{2}$  square centimetres.

What is the volume of this cube, in cubic centimetres?

TEAM NUMBER

SCHOOL NAME

<p><b>A1</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>B1</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>C1</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>D1</b></p> <p style="text-align: right;">0 1 3</p>
<p><b>A2</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>B2</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>C2</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>D2</b></p> <p style="text-align: right;">0 1 3</p>
<p><b>A3</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>B3</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>C3</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>D3</b></p> <p style="text-align: right;">0 1 3</p>
<p><b>A4</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>B4</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>C4</b></p> <p style="text-align: right;">0 1 3</p>	<p><b>D4</b></p> <p style="text-align: right;">0 1 3</p>

BONUS 3

BONUS 3

BONUS 3

BONUS 3

A TOTAL /15

B TOTAL /15

C TOTAL /15

D TOTAL /15

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.

FINAL SCORE /60