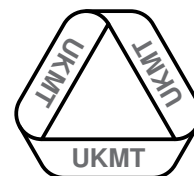
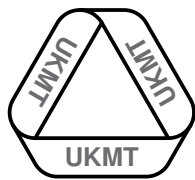


## Instructions

- There are 4 rounds to this Shuttle Round. Each round contains a set of four questions.
- Each round lasts 8 minutes.
- Three marks are awarded for every answer correct on the first attempt or 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. Further instructions for scoring are provided in the Supervisor's Booklet.
- 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, the RESPONSE SHEET should be handed to the supervising teacher for marking.



# A1

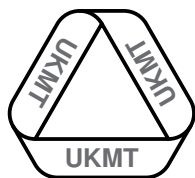
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$X$  is the value of one less than three cubed.

Pass on the value of  $X$ .

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# A3

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$T$  is the number you will receive.

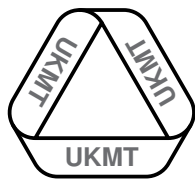
$T^\circ$ ,  $(T + 1)^\circ$ ,  $(T + 2)^\circ$ ,  $(T + 3)^\circ$  are four angles in a pentagon.

$X^\circ$  is the fifth angle in the pentagon.

Pass on the value of  $X$ .

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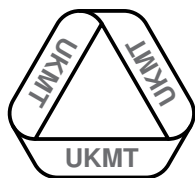
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**A2**

*T* is the number you will receive.

$T - 5$  is the difference between two consecutive square numbers.

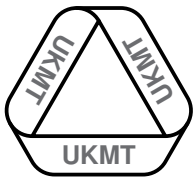
Pass on the larger of the two square numbers.

**A4**

*T* is the number you will receive.

On a journey my average speed was  $T + 4$  kilometres per hour. The journey took 3 hours and 10 minutes.

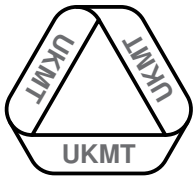
Write down the length of my journey in kilometres.



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# B1

$\frac{3}{4} \times \frac{2}{9} \times \frac{5}{6}$  may be written as  $\frac{a}{b}$  where  $a$  is a prime number and  $b$  is a square number.

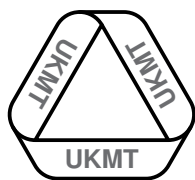
Pass on the value of  $a + b$ .

# B3

$T$  is the number you will receive.

$$\frac{T}{2} + \frac{T}{3} + X = 1.$$

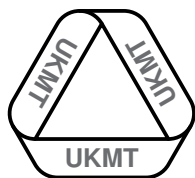
Pass on the value of 1 divided by  $X$ .



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**B2**

*T* is the number you will receive.

The difference between two numbers is  $T - 1$ .

The sum of the two numbers is  $T + 1$ .

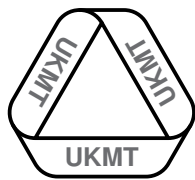
Pass on the smaller of the two numbers.

**B4**

*T* is the number you will receive.

A cuboid has edges of lengths  $T$  cm,  $\frac{T}{2}$  cm and  $\frac{T}{3}$  cm.

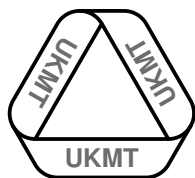
Write down the total length, in centimetres, of all the edges of the cuboid.



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# C1

The three angles of a triangle are  $(X + 10)^\circ$ ,  $(X + 20)^\circ$ ,  
 $(X + 30)^\circ$ .

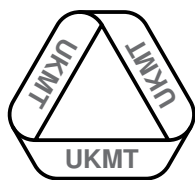
Pass on the value of  $X$ .

# C3

*T is the number you will receive.*

$X$  is the lowest common multiple of  $T + 1$  and  $2T$ .

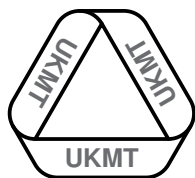
Pass on the value of  $X$ .



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**C2**

*T* is the number you will receive.

The surface area of a cube is  $T + 2$  square centimetres.  
Each face of the cube has an area  $X$  square centimetres.

Pass on the value of  $X$ .

**C4**

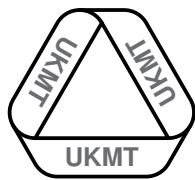
*T* is the number you will receive.

$T$  is the number of coins that you have.

You have equal numbers of 1p, 2p, 5p, and 10p coins.

Write down the total value, in pence, of all the coins you have.

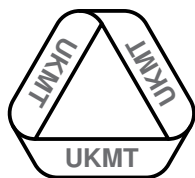




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# D1

$X$  is the sum of 207 divided by 9 and 184 divided by 4.

Pass on the sum of the digits of  $X$ .

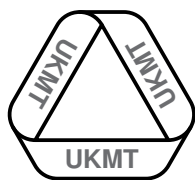
# D3

$T$  is the number you will receive.

You have  $T$  square tiles each 10 cm by 10 cm.

You use them to cover a rectangle which is 90 cm by 60 cm.

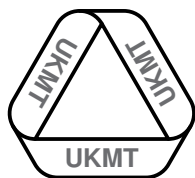
Pass on the number of tiles you have left over.



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**D2**

*T* is the number you will receive.

*T* is the middle number of five consecutive whole numbers.

Pass on the sum of the five numbers.

**D4**

*T* is the number you will receive.

$3T + 6$  is the sum of six consecutive positive whole numbers.

Write down how many of these six numbers are prime numbers.

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