

## GROUP ROUND INSTRUCTIONS

- Your team will have 45 minutes to answer 10 questions. Each team will have the same questions.
- Each question is worth 6 points. However, some questions are easier than others!
- You will have to decide your team's strategy for this group competition.
- There is only one answer sheet per team. Five minutes before the end of the time you will be told to finalise your answers and write them on to the answer sheet. This answer sheet is the only thing that will be marked.



## *Question 1*

How many times does the digit 3 appear when the whole numbers between 1 and 150 are written down?



## *Question 2*

A car's milometer shows that the number of miles it has travelled is 15951. This number is palindromic which means it reads the same forwards as backwards. The next time a palindromic number appears on the milometer is exactly two hours later. Find the average speed of the car during these two hours.



### *Question 3*

What is the value of

$$1 - 2 + 3 - 4 + 5 - 6 + \dots + 2011 - 2012 + 2013 ?$$



### *Question 4*

Five consecutive whole numbers add up to 162 after the middle one has been doubled. Find the smallest of these five numbers.



## *Question 5*

How many diagonals does a regular octagon have?



## *Question 6*

Five positive whole numbers have the following properties:

Their mean is 4;  
Their median is 2;  
Their mode is 2;  
Their range is 6.

What is the product of these five positive integers?



## *Question 7*

A shopkeeper paid £30 (cost price) for a coat. She wishes to place a price tag on it so that she can offer a 10% discount on the price marked on the tag and still make a profit of 20% on the cost price.

What price should she mark on the tag?



## *Question 8*

Claire, David, Jean and Richard are queuing for the bus. In how many different ways can they line up in single file, one behind the other, without Jean being last?



### *Question 9*

A cube is divided into 64 identical smaller cubes. Seven of these smaller cubes are removed. The resulting shape has a volume of  $1539 \text{ cm}^3$ .

What is the surface area of the original cube?



## *Question 10*

Dean spent one fifth of the amount of money in his wallet and then one fifth of what remained. He spent a total of £72. Find the amount of money in his wallet to start with.



# UKMT Team Maths Challenge

## GROUP answer sheet

Team number .....

School name .....

<p><b>1. Number of times:</b></p> <p style="text-align: right;"><b>6 or 0</b></p>	<p><b>2. Average speed:</b></p> <p style="text-align: right;">mph</p> <p style="text-align: right;"><b>6 or 0</b></p>
<p><b>3. Total:</b></p> <p style="text-align: right;"><b>6 or 0</b></p>	<p><b>4. Smallest number:</b></p> <p style="text-align: right;"><b>6 or 0</b></p>
<p><b>5. Number of diagonals:</b></p> <p style="text-align: right;"><b>6 or 0</b></p>	<p><b>6. Product:</b></p> <p style="text-align: right;"><b>6 or 0</b></p>
<p><b>7. Price:</b></p> <p style="text-align: center;">£</p> <p style="text-align: right;"><b>6 or 0</b></p>	<p><b>8. Number of different ways:</b></p> <p style="text-align: right;"><b>6 or 0</b></p>
<p><b>9. Surface area:</b></p> <p style="text-align: center;">cm<sup>2</sup></p> <p style="text-align: right;"><b>6 or 0</b></p>	<p><b>10. Amount of money:</b></p> <p style="text-align: center;">£</p> <p style="text-align: right;"><b>6 or 0</b></p>

Award 6 points for each correct answer.

TOTAL SCORE = \_\_\_\_\_

