

GROUP COMPETITION 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

Find the sum of the digits when all the integers from 1 to 99 inclusive are written down. It is the sum of the digits that is required and not the sum of the integers, for example, for all the integers from 10 to 15 inclusive the sum of the digits is 21.



Question 2

Alan owned two exercise bicycles. He sold the first for £300, making a loss of 25% on that one, and then sold the second one, also for £300, but this time making a profit of 25%.

Tick the box to show whether Alan broke even, or made a profit or loss overall.

If he made a profit or loss then *also* write down by how much (in pounds).



Question 3

Find the smallest number whose digits are only 0s and 1s that is exactly divisible by 15.



Question 4

Find the sum of all numbers less than 120 which are the product of exactly three different prime factors.



Question 5

At a certain time in a race, Manjit is 125 metres behind Sarah. Sarah is 495 metres ahead of Pippa. Pippa is 200 metres behind Claire and Claire is 675 metres behind Jackie. Find the distance between Claire and Manjit.



Question 6

Each one of a group of 20 children plays either football or hockey. Nobody plays both. Nine of these children play football. Eight of the children are boys. Eight of the girls are hockey players. Find the number of boys who play football.



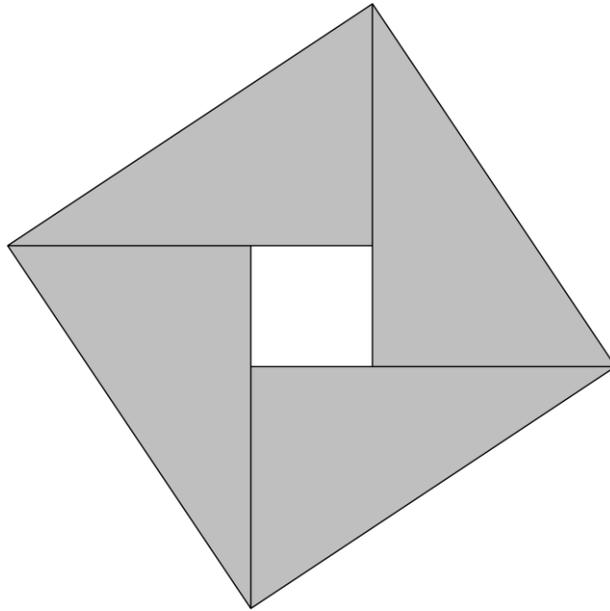
Question 7

$ABCD$ is a square; $BCGFE$ is a regular pentagon, not overlapping the square. AB and BE are adjacent sides of a regular polygon. How many sides does this polygon have?



Question 8

I have two identical rectangular pieces of toast, 8cm by 12cm. I cut each piece along a diagonal and place the four triangles, long edge to short, to form a square with a square gap in the middle, as shown.



What is the ratio of the areas, small square : large square in its lowest terms?



Question 9

In how many ways can you split your team of 4 people into two separate teams, so that there is at least one person in each team?



Question 10

$$\begin{array}{r} T T \\ M M \\ + C C \\ \hline T M C \end{array}$$

The letters T, M and C in the addition sum above represent three different non-zero digits. Find the values of T, M and C.



UKMT Team Maths Challenge

GROUP answer sheet

Team number

School name

<p>1. Sum of digits:</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>	<p>2. Tick one box and, if Alan made a profit or loss, write the amount.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 2px;"><i>Tick</i></th> <th style="text-align: center; padding: 2px;"></th> <th style="text-align: center; padding: 2px;"><i>Amount</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 2px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 2px;">Broke Even</td> <td style="text-align: center; padding: 2px;">-</td> </tr> <tr> <td style="text-align: center; padding: 2px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 2px;">Profit</td> <td style="text-align: center; padding: 2px;">£</td> </tr> <tr> <td style="text-align: center; padding: 2px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 2px;">Loss</td> <td style="text-align: center; padding: 2px;">£</td> </tr> </tbody> </table> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>	<i>Tick</i>		<i>Amount</i>	<input type="checkbox"/>	Broke Even	-	<input type="checkbox"/>	Profit	£	<input type="checkbox"/>	Loss	£
<i>Tick</i>		<i>Amount</i>											
<input type="checkbox"/>	Broke Even	-											
<input type="checkbox"/>	Profit	£											
<input type="checkbox"/>	Loss	£											
<p>3. Number:</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>	<p>4. Sum of numbers:</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>												
<p>5. Distance between them:</p> <p style="text-align: center; padding: 5px;">metres</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>	<p>6. Number of boys who play football:</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>												
<p>7. Number of sides:</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>	<p>8. Ratio of areas:</p> <p style="text-align: center; padding: 20px;">:</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>												
<p>9. Number of ways:</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>	<p>10.</p> <p style="text-align: center; padding: 10px;">T = , M = , C =</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">6 or 0</p>												

Award 6 points for each correct answer.

TOTAL SCORE = _____

