

## 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.

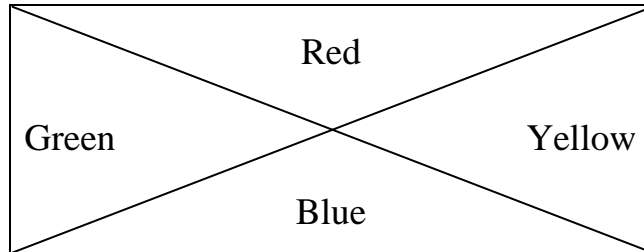


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## Question 1

A tile is fixed to a wall and then painted with four different colours, one for each quarter. One way of doing this is



In how many **other** ways may the tile be painted?



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## *Question 2*

Sarah goes up a hill and then down again the same way. On the way up she averages 2 miles per hour. On the way down she averages 4 miles per hour. What is Sarah's average speed in miles per hour for the whole journey? Give an exact answer.



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### *Question 3*

The name Matilda is written repetitively like this:

MatildaMatildaMatildaMatilda.....

What is the 1000th letter?



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## Question 4

The ten digits of a digital clock are shown below.

0 1 2 3 4 5 6 7 8 9

I have a 12 hour digital clock which shows the time, using four digits, on a piece of glass, so it can be seen from both sides. At what time between 3 o'clock and 10 o'clock does the time look the same from both sides?



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## Question 5

$ABCD$  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?



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## Question 6

Some students (fewer than 100) are having trouble lining up for a school production.

When they line up in 3s, two people are left over.

When they line up in 4s, three people are left over.

When they line up in 5s, four people are left over.

When they line up in 6s, five people are left over.

How many students are there in the group?



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## *Question 7*

The digits of Alberta's age are interchanged and 1 is added. The answer is half of Alberta's present age. How old is Alberta now?



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## Question 8

35 teenagers were asked what takeaways they liked to eat.

24 answered Chinese

16 answered Indian

10 answered pizza

None of the teenagers liked all three. All who liked pizza also liked Chinese and 9 of the Chinese fans didn't like either Indian or pizza.

If all the teenagers liked at least one, how many liked only Indian?



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## *Question 9*

12345 can be expressed as the sum of two primes in exactly one way. What is the larger of the two primes?



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## *Question 10*

Three squirrels, Steve, Keith and Benjamin, have spent all day collecting nuts. At the end of the day they are very tired and go to bed.

During the night, Steve wakes up and eats a nut. He then decides to take half of the remaining pile and hides it before going back to sleep.

Keith then wakes up. He too is hungry, so eats a nut. He also takes half of the remaining pile and hides it before going back to sleep.

Finally, Benjamin wakes up, eats a nut and hides half of the remaining pile.

In the morning, all of the squirrels share the remaining nuts equally between them and each goes off with four more nuts. Each squirrel then eats all the nuts he now has.

How many nuts has Steve eaten in total?



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# UKMT Team Maths Challenge

## GROUP answer sheet

Team number .....

School name .....

<b>1.</b> Number of other ways tile may be painted	<b>2.</b> Average speed  miles per hour
<b>3.</b> 1000th letter	<b>4.</b> Time
<b>5.</b> Number of sides	<b>6.</b> Number of students
<b>7.</b> Alberta's age	<b>8.</b> Number of teenagers
<b>9.</b> Larger of two primes whose sum is 12345	<b>10.</b> Number of nuts

Award 6 points for each correct answer.

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



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