

## 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*

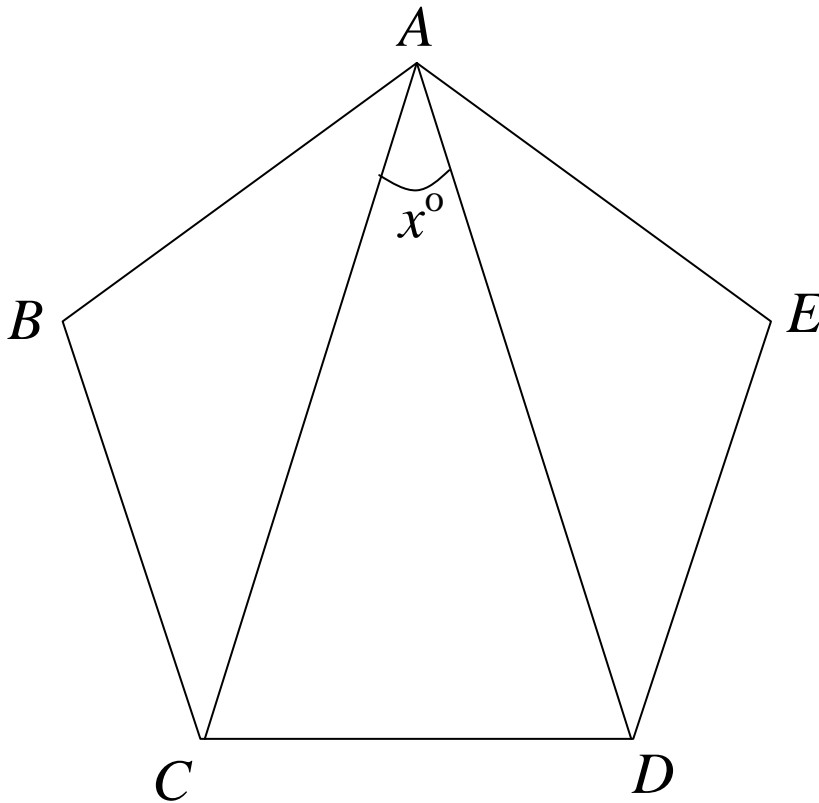
Find the value of  $\frac{x^2 - 4}{x^2 - 2x}$  when  $x = 0.5$ .



## Question 2

$ABCDE$  is a regular pentagon with its diagonals  $AC$  and  $AD$  drawn in.

Work out the size of the angle  $CAD$ .



### *Question 3*

Five whole numbers have the following properties:

mean = 8

median = 8

mode = 8

range = 7 .

The largest number is 11. Find the product of these five numbers.



### *Question 4*

In a four-digit number, where the digits are all different, the sum of the first two digits (counting from the left) equals the sum of the last two. The first digit is four times the last, and the third digit is three times the second.

Find the four-digit number.



### *Question 5*

Ian, Barbara and Martin shared £50. The ratio of the amount Ian received to the total amount shared by Barbara and Martin was 3 : 2. Barbara received £4 more than Martin.

What did each receive?



## *Question 6*

A closed cardboard box measuring 7 cm by 14 cm by 5 cm is filled completely with unit (1 cm by 1 cm by 1 cm) cubes.

How many of these unit cubes touch the box with at least one face?



## *Question 7*

One morning the hour hand of a clock is pointing directly at the 38-minute mark.

At what time does this occur?



## *Question 8*

There are 100 students in a school year group. On one day 99% of the students are present. Only 98% of the students with brown hair are present.

How many of the 100 students have brown hair?



## *Question 9*

A palindromic number is a number which is the same whether it is read forwards or backwards. The product of the digits of a three-digit palindromic number is two-thirds of the sum of the digits.

What is the smallest three-digit palindromic number with this property?



## *Question 10*

$$J6K4 \times 7 = L9M98$$

Each of  $J$ ,  $K$ ,  $L$  and  $M$  is a different digit.

Find the values of  $J$ ,  $K$ ,  $L$  and  $M$ .



# UKMT Team Maths Challenge

## GROUP answer sheet

Team number .....

School name .....

<p><b>1.</b> Value of <math>\frac{x^2 - 4}{x^2 - 2x}</math></p>	<p><b>2.</b> Size of angle <math>CAD</math> in degrees</p> <p style="text-align: center;">_____°</p>
<p><b>3.</b> Product</p>	<p><b>4.</b> Four-digit number</p>
<p><b>5.</b> Amounts received</p> <p style="margin-left: 20px;">Ian            £</p> <p style="margin-left: 20px;">Barbara      £</p> <p style="margin-left: 20px;">Martin        £</p>	<p><b>6.</b> Number of cubes</p>
<p><b>7.</b> Time</p>	<p><b>8.</b> Number of students with brown hair</p>
<p><b>9.</b> Palindromic number</p>	<p><b>10.</b> Values</p> <p style="margin-left: 40px;"><math>J =</math>            <math>K =</math></p> <p style="margin-left: 40px;"><math>L =</math>            <math>M =</math></p>

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

