



UNITED KINGDOM MATHEMATICS TRUST

GROUP ROUND

- Time allowed: 45 minutes.
- There are 15 questions to try to answer in the time allowed.
- Each question is worth *four* marks. A question is marked either correct or incorrect – no partial marks are awarded.
- Some questions are easier than others!
- You will have to decide your team's strategy for this group competition. Do you split up so that individuals work on a few questions each, or do you work in pairs on a greater number of questions? Working all together on all the questions may well take too long. You decide!
- 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.
- Answers should be in their simplest form where appropriate.

Answer Sheet (Ignore Units)

School Name _____

School Number _____

<u>Question 1</u>	<u>Question 2</u>
<u>Question 3</u>	<u>Question 4</u>
<u>Question 5</u>	<u>Question 6</u>
<u>Question 7</u>	<u>Question 8</u>
<u>Question 9</u>	<u>Question 10</u>
<u>Question 11</u>	<u>Question 12</u>
<u>Question 13</u>	<u>Question 14</u>
<u>Question 15</u>	Award six points for each correct answer. <u>Total:</u>

Question 1

The school 5-a-side football squad is made up of four boys: Peter, Tom, Mark and Robert, and four girls: Ursula, Kate, Malinda and Tina.

For the final game of the season, a team of three boys and two girls has to be chosen. However, unfortunately Mark will not play if Tina is picked, and Ursula will not play if Tom is picked.

In how many ways could a team be chosen for the final game of the season?

Question 2

Amy and Adam are in training for a half marathon. They are training by running round a 360m circuit. They start by running in opposite directions, Amy at 4 metres/second and Adam at 5 metres/second.

How far will Amy have run when they cross for the first time?

Question 3

In the table below the numbers from 1 to 16 can be placed such that each number is only used once and the sum of the numbers in every row, column and 2 x 2 square adds to 34.

What is the value of $X + Y + Z$?

X			Y
	16		
	5	11	6
Z			9

Question 4

Each pupil in the class is given a card with either a two digit prime number or a two digit square number or a two digit cube number on the card.

Three of the pupils show their cards. The total of the three numbers is 81 and there is one prime number, one square number and one cube number showing.

What are the three numbers?

Question 5

I think of a positive number.

One less than my number is multiplied by 5 and one more than my number is multiplied by 4.

The difference between these two numbers is 1.

What is my number?

Question 6

The school site covers 8000m^2 . The buildings take up $\frac{3}{5}$ of the area of the school site. Hard play areas occupy $\frac{1}{4}$ of what is left and the rest of the site is footpaths and grass. The area of grass is seven times the area of the footpaths.

How many square metres of the school site is covered in grass?

Question 7

Three ordinary dice are thrown. The numbers showing on the top face are arranged to form a three digit number.

How many ways can this be done if the sum of the three digits is a cube number?

Question 8

I form a sequence of numbers by always adding the same number to produce the next number in the sequence.

The tenth number in the sequence is 67 and the fifteenth is 82.

What is the sum of the first and twentieth numbers in the sequence?

Question 9

The sum of the numbers from 1 to 100 is 5050.

What is the sum of all the digits in the numbers from 1 to 100 inclusive?

Question 10

There are 51 girls in the school year which has 100 pupils.

All of the pupils were asked to say which was their favourite sport, football, tennis or cricket.

The number of boys who chose tennis was twice the number of boys who chose football.

7 boys chose cricket.

41 pupils chose tennis.

The number of girls that chose football was $\frac{3}{7}$ of the number of boys in the school year.

How many pupils chose cricket?

Question 11

In a game you need to get the three coloured discs, green, orange and red in the correct order. Three attempts have been made and are shown below with the number of coloured discs that are in the correct positions.

What is the correct order for the three coloured discs?

Position 1	Position 2	Position 3	Number Correct
Red	Orange	Green	One
Red	Green	Orange	None
Green	Orange	Red	None

Question 12

I buy food for my three cats in boxes of 24 cans each week.

Each of my cats eat a can every day of the week.

After how many weeks will I not have to buy any cans for the following week?

Question 13

My 5km journey to town by bus takes 30 minutes. The bus stops 20 times for 30 seconds on average to pick up and drop off passengers before it gets to town.

What would the average speed of the journey into town be if the bus did not stop until it reached its destination?

Question 14

$$E = \frac{1}{8}$$

$$T + E + A + M = \frac{1}{3}$$

$$I + C + E = \frac{1}{4}$$

$$M + A + T + H + S = \frac{1}{2}$$

What is the value of:

$$M + A + T + H + E + M + A + T + I + C + S?$$

Question 15

In each game of the schools' rugby tournament our team scored either 5 points or 7 points.

They scored 5 points three times as often as they scored 7 points.
They scored 440 points altogether.

How many times did the team score 7 points in the tournament?