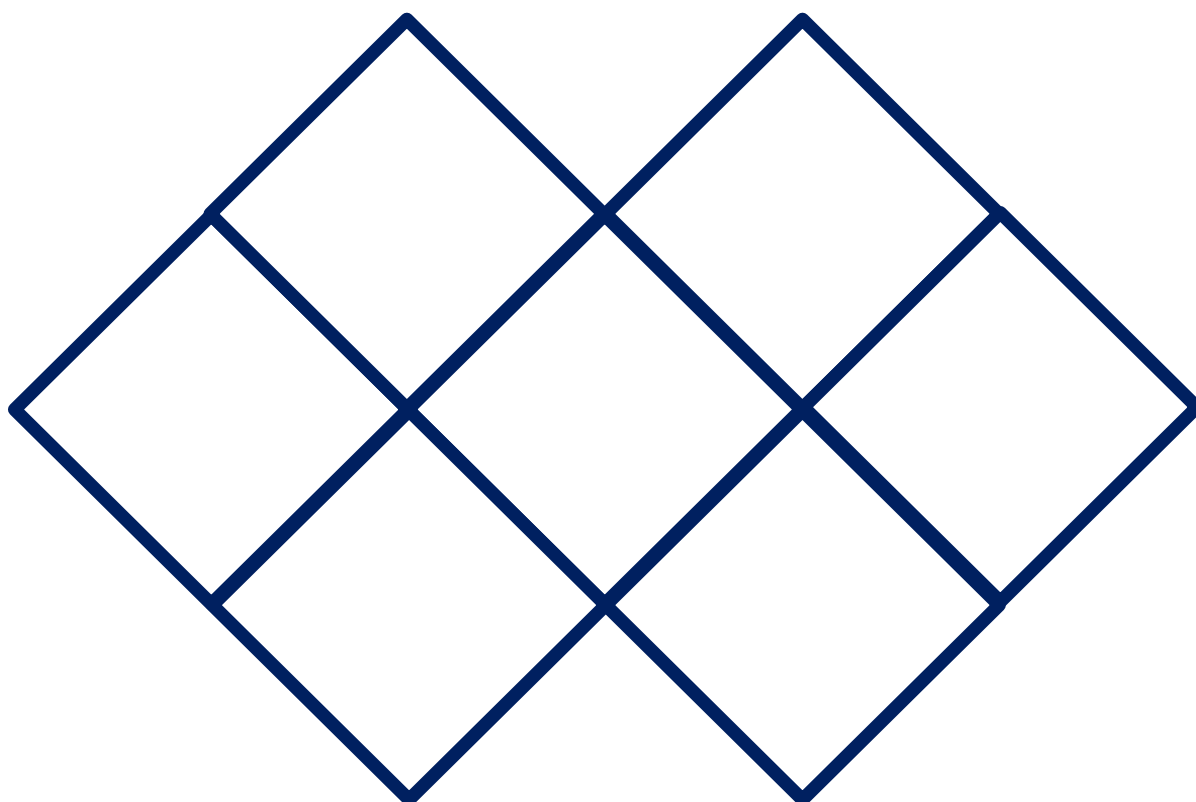




Task 1 (15 marks)

Put the first seven natural numbers (1, 2, 3, 4, 5, 6 and 7) into the squares so that *every line of three squares* adds up to 10.





Task 2 (15 marks)

Arrange the digits 1, 2, 3, 4, 5 into the multiplication calculation below to give the *largest* possible answer.

$$\square \square \square \times \square \square$$



Task 3 (15 marks)

A boy has as many sisters as brothers.

Each sister in the family has only half as many sisters as brothers.

How many boys and how many girls are in the family?



Task 4 (25 marks)

Five maths teachers have been growing pumpkins in their gardens, each trying to grow the biggest.

Use the clues below to figure out what size of pumpkin each teacher grew and what their pumpkin was used for.



Sizes 34 cm, 35 cm, 36 cm, 38 cm and 40 cm

Clues

- Mr Edmond's pumpkin was 1 cm smaller than the one used to make soup.
- Local hooligans used the largest pumpkin as a football, this amused Mrs Reid, who didn't grow it.
- The pumpkin that was used to make the lantern was 2 cm bigger than the pumpkin grown by Mr Moon.
- Mrs Anderson's pumpkin was left to rot and Mr Welsh's pumpkin was not used in a pie.

Transfer your solution to the grid on your team answer sheet.



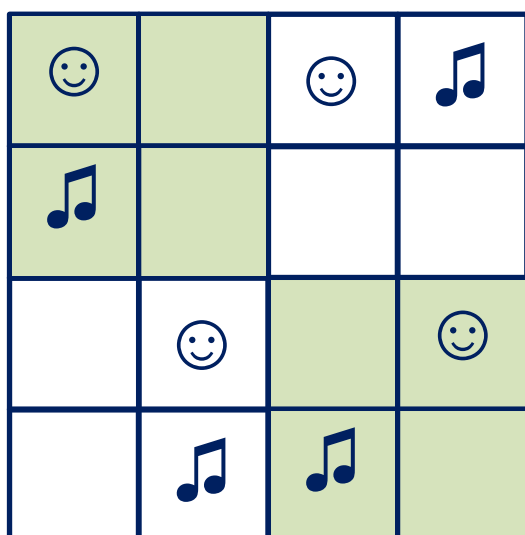
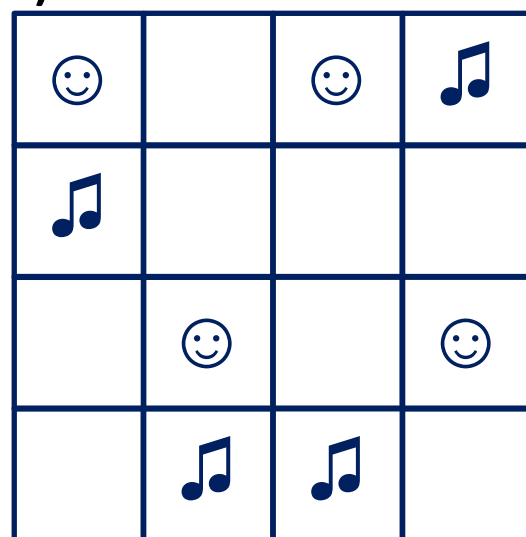
Team Contest

Task 5 (20 marks)

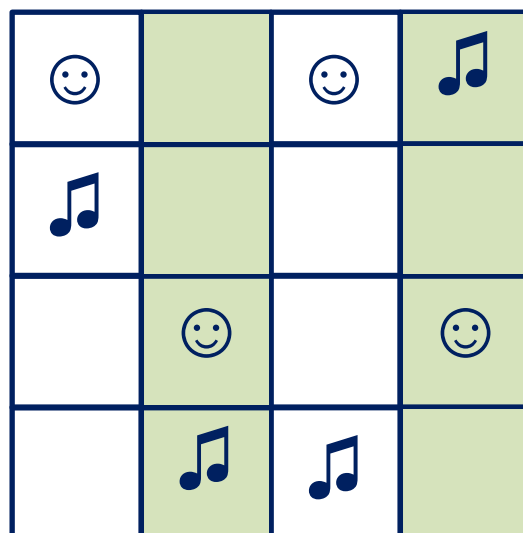
This square can be divided into four pieces, identical in size and shape.

Each piece must contain one ☺ and one 🎵.

This can be done in at least two ways as shown below:

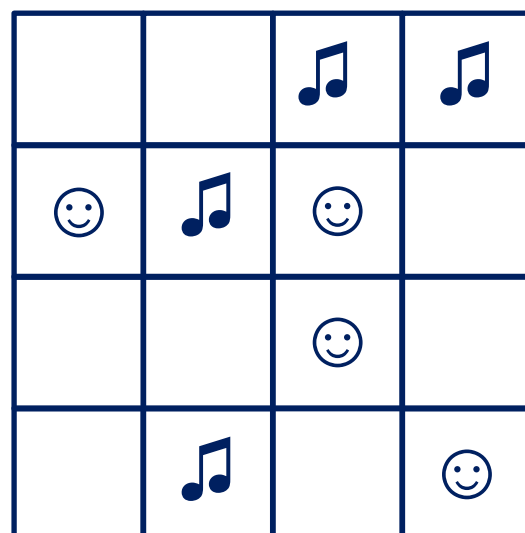


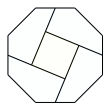
and



Divide this new square into four pieces so that, identical in size and shape.

Each piece must contain one ☺ and one 🎵.





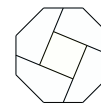
Team Contest

Task 6 (15 marks)

A glass is full of milk. The total mass is 350 g.

When the glass is half full of milk,
the mass is 270 g.

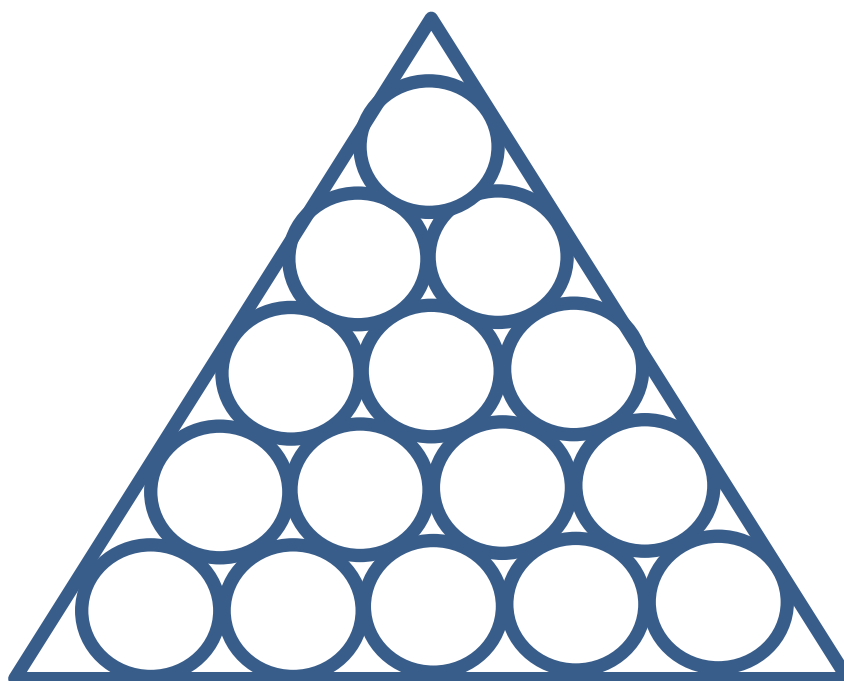
What is the mass of the glass?



Team Contest

Task 7 (25 marks)

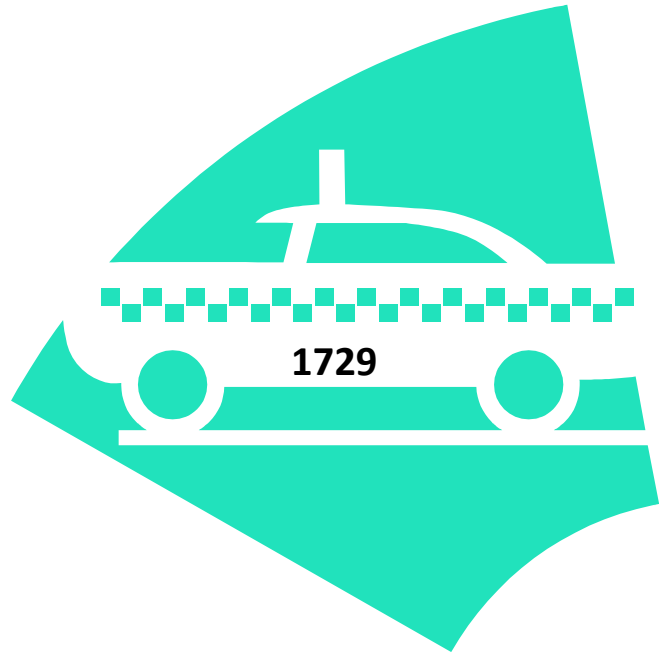
Your task is to fill all circles in the diagram with a number 1, a number 2 or number 3 in such a way that no two numbers of the same value touch.





Task 8 (15 marks)

The brilliant Mathematician Srinivasa Ramanujan was visited by a friend who arrived in a taxi which had the number 1729 on it.

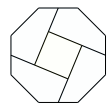


Ramanujan immediately said “1729 is a very interesting number- it’s the smallest number that can be expressed as the sum of two cubes **in two different ways**”.

Find the values of a , b , c and d that show the two ways Ramanujan referred to.

$$a^3 + b^3 = 1729$$

$$c^3 + d^3 = 1729$$



Team Contest

Task 9 (20 marks)

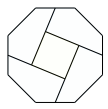
A car uses petrol at the rate of 6 miles per litre and starts off with a full tank of 60 litres.

It travels a distance of 160 miles at 66mph.

However, a hole in the petrol tank means that it is leaking petrol and at the end of the journey the tank is completely empty.



How much petrol is the car losing per hour?



Team Contest

Task 10 (20 marks)

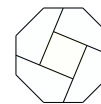
Mr Smith invested £30,000.

Some of this was invested in an account with annual interest of 5%.

The rest was invested in an account with annual interest of 8%.

After a year, the total interest on his investment was £2,040.

How much did he invest in the 5% account?



Team Contest

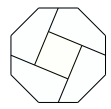
Task 11 (25 marks)

Cut or tear out these strips and arrange them to form four correct equations.

Hint: The mathematical operation strips can be used upside down. The numbers cannot.

13	5	2	16	÷	+	-
10	15	3	2	+	÷	×
4	7	14	11	=	=	+
6	8	9	12	=	×	=

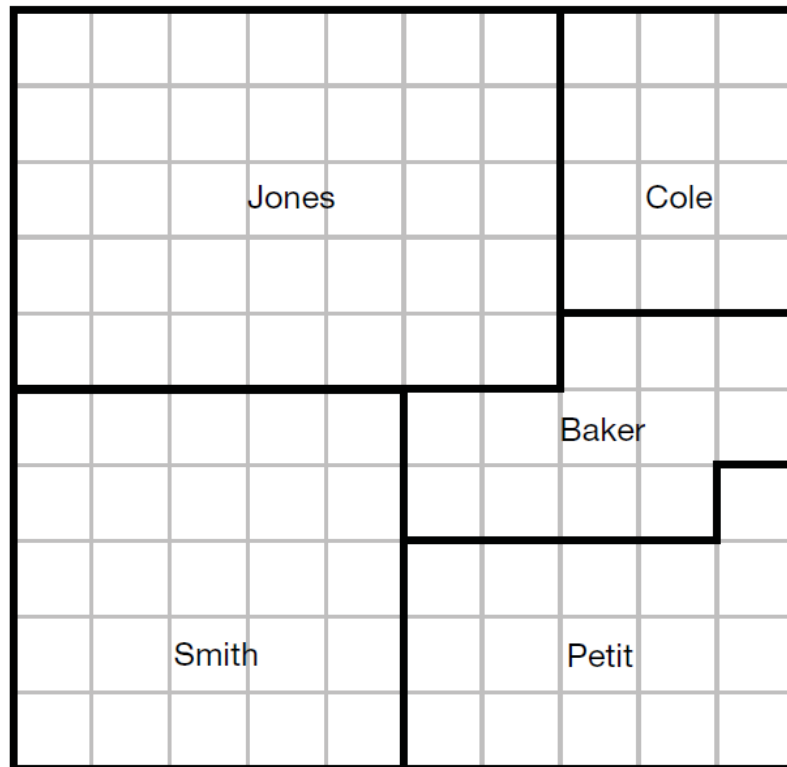
Transfer your solution to the grid on your team answer sheet.



Team Contest

Task 12 (20 marks)

The map shows the farms owned by five farming families.



The county charges a tax based on the size of each farm, not on the quality of the land, so all land is taxed at the same rate.

The Joneses pay £5,250 per year in taxes.

After the map was drawn, the Bakers purchased some property from the Petits and increased the size of their property to 125% of its size on the map.

How much will the new tax bill be for the Petits' farm?