Task 1

Tower of dice

Equipment: regular dices

You should stack the dices on top of each other so that the sum of the faces that are in contact will have a constant value across the stack.

a) How many values can you choose?
b) How many dices can the tower consist of per value?

Task 1

Answer Sheet **Country: _____**

a) b)

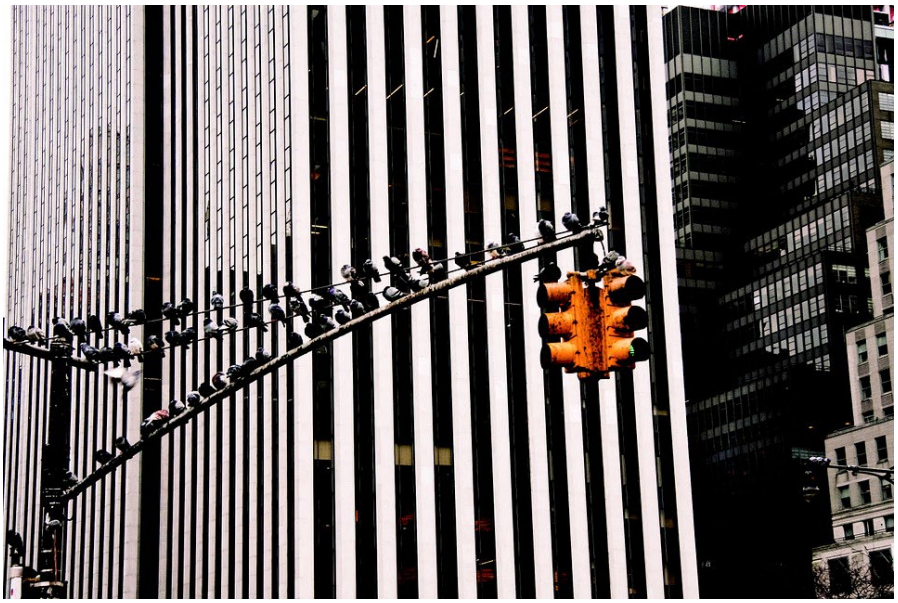
Values	Dice

Task 2

Traffic lights

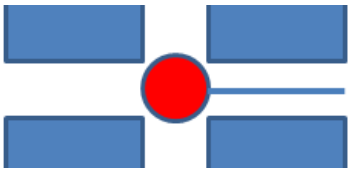
Equipment: Graph paper with streets. Plastic pieces to mark traffic lights.

In many cities the streets form a grid in the same way as in large parts of Manhattan (New York).



At each crossing there are traffic lights.

Use the «map» with the grid. Start at the crossing marked with a point and move one block from this crossing in all directions.



The line shows one block in one direction.

a) How many traffic lights are there in total in all the crossings you have been to?
b) What will the result be if you move two blocks away from the original crossing in all directions?
c) Investigate further.
d) Find a rule for the number of traffic lights at the crossings.

Task 2

Answer Sheet **Country: _____**

a)-c)

BLOCKS	TRAFFIC LIGHTS

d)

Task 3

Area with perimeter 12

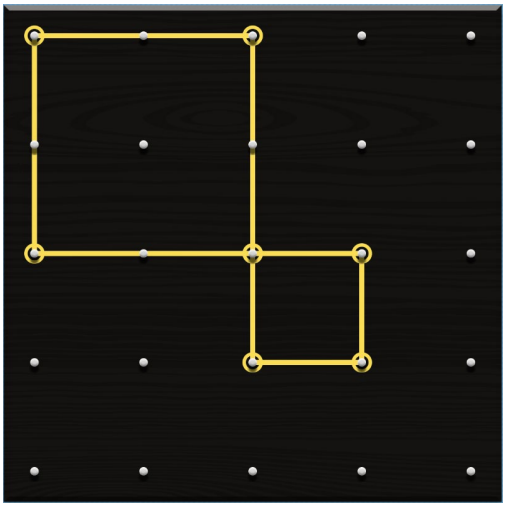
Equipment: Two geoboards 5 x 5

On a geoboard with 5 x 5 pegs you should make polygons consisting of different numbers of unit areas. All the polygons should have perimeter 12.

Note: The figures should have their vertices on the pegs.

Write the different areas you are able to find and draw
the corresponding figures.

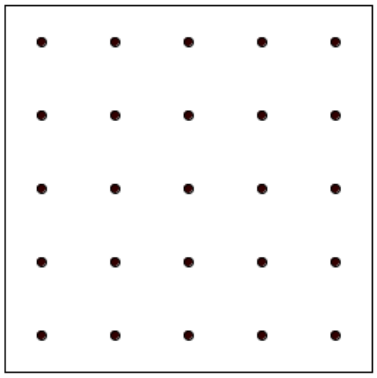
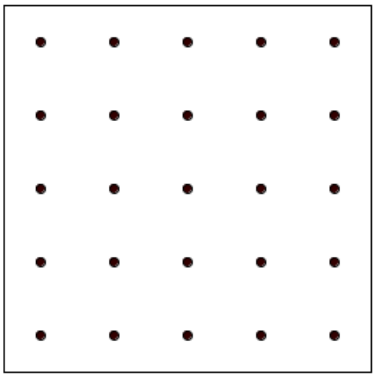
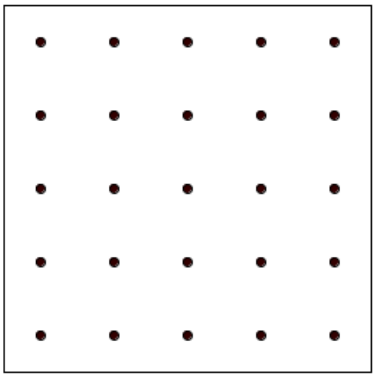
This figure below has perimeter 12 and area 5.
However it cannot be accepted because the area is not connected.



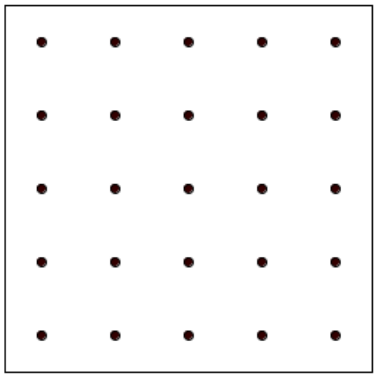
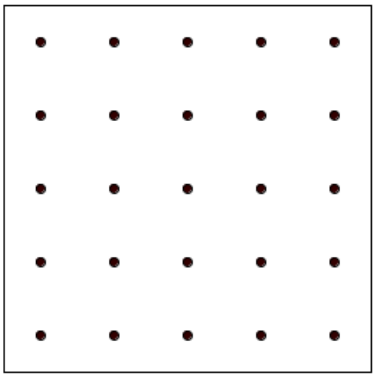
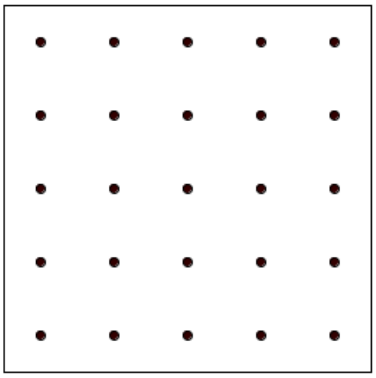
Task 3

Answer Sheet **Country: _____**

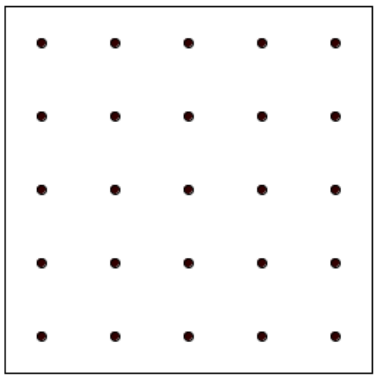
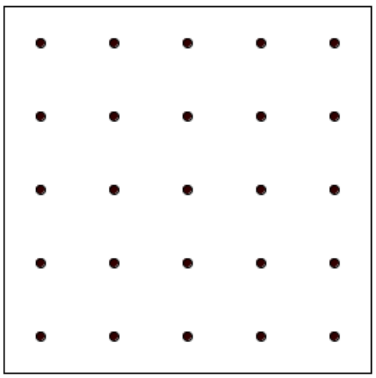
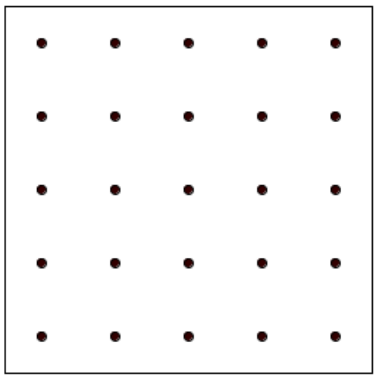
Area: _____ **Area: _____** **Area: _____**

Area: _____ **Area: _____** **Area: _____**

Area: _____ **Area: _____** **Area: _____**

Task 4

A peculiar fraction

Equipment: Two sets of cards with the digits 1-8. Four cards with the digit 9.

$$\frac{1647}{8235} = \frac{1}{5}$$

The value of the fraction is one fifth.

The peculiar thing is that one can remove one digit in the numerator and one in the denominator, and the value of the fraction will still be one fifth!

a) Find out which digits can be removed and write the new fraction in the answer sheet.

If you remove one more digit in the numerator and denominator the fraction can still maintain the same value.

b) Remove these digits and write the new fraction in the answer sheet.

Now go back to the original fraction and insert the digit 9 in both the numerator and the denominator. The value of the fraction should still be one fifth!

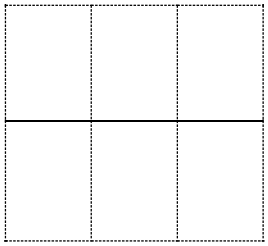
c) Write the fraction with five digits in the numerator and denominator in the answer sheet.

Task 4

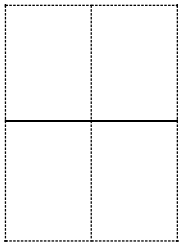
Answer Sheet

Country: _____

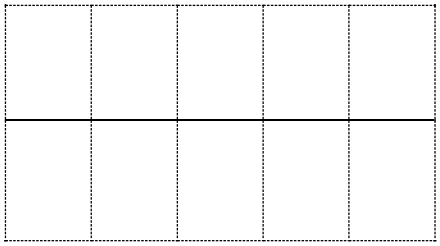
a)



b)



c)



Task 5

Number sign rotated 180°

Equipment: 2 sets of cards with the digits 1-9

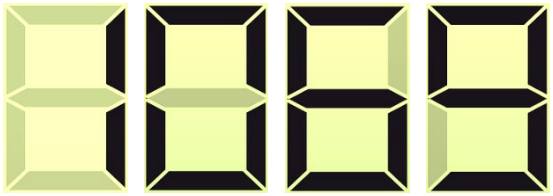
A number sign with 5 different digits is rotated 180° so that it is hanging upside-down. No two digits in the number are the same.

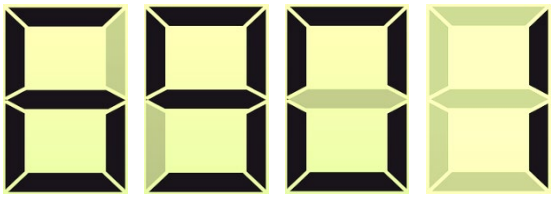
The number on the sign still makes sense, but it is 67023 larger than the original number.

Find the original number.

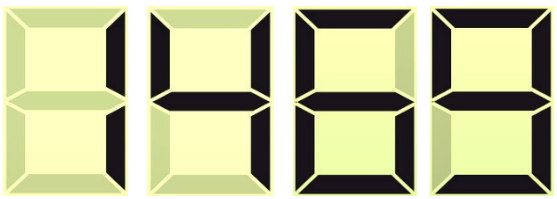
Examples of four-digit numbers that have been rotated 180°.

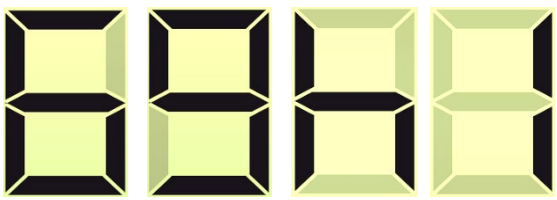
Numbers that still make sense after being rotated:





Numbers that do not make sense after being rotated:





Task 5

Answer Sheet

Country: _____

The correct number is

Additional task

Largest possible product

Equipment: calculator

17 can be written as a sum of positive numbers in various ways.

For example:

$$17 = 5{,}5 + 5{,}5 + 6 \quad \text{og} \quad 17 = 2 + 3 + 5 + 7$$

By multiplying the numbers in the sums one gets:

$$5{,}5 \cdot 5{,}5 \cdot 6 = 181{,}5 \text{ og } 2 \cdot 3 \cdot 5 \cdot 7 = 210$$

Express 17 as a sum that yields the highest possible product

when you multiply the numbers in the sum.

Answer **Country:** _____