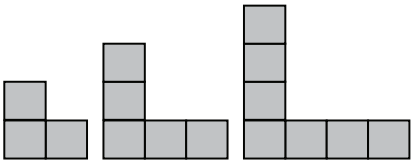
START for ALL PARTICIPANTS

1. THE Ls (coefficient 1)



Matthew received a box of 50 cubes, which he assembled into a series of increasingly larger L shapes, as shown in the figure.
What is the maximum number of L shapes he can build with his box of 50 cubes?

2. PIGGY BANK (coefficient 2)

In his piggy bank, Tom has 25 euro cents composed of 5, 2, and 1 cent coins.
What is the minimum number of coins he has, given that he has at least one of each type?
1 euro = 100 cents

3. MOBILE SHADOW (coefficient 3)

A mobile, composed entirely of squares, hangs from the ceiling.
At night, its silhouette appears on the wall:
we see partially overlapping squares.
What is the minimum number of squares making up the mobile?
Note: a rotated square remains a square.

4. MAGIC SQUARE (coefficient 4)

Complete the magic square below with the following conditions:
• Each row and column must contain the four numbers 1, 2, 3, and 4;
• The two numbers replacing the letters A and B are less than 3.

		2	
		3	A
3		B	2

5. JULIA'S CODE (coefficient 5)

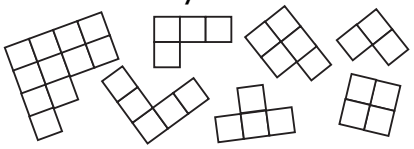
Curious Julia found a chest locked with a three-digit secret code in an attic.
Luckily, someone had left an old sheet of paper with code attempts and some clues (see image). Julia managed to open it.
What is this code?

	number of correct digits	number of correct digits correctly placed
9 6 5	1	0
1 8 4	1	0
1 9 3	3	1

END for CE PARTICIPANTS

6. PUZZLE (coefficient 6)

These seven puzzle pieces are made from small squares of side 1 cm. Matilda can take single examples of one or more of these pieces to form a square larger than 2x2 and without any holes.

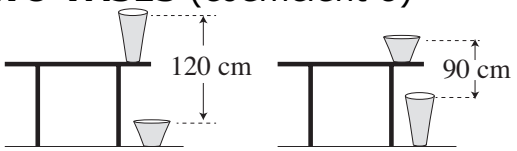


Matilda can choose to build more than one square. Each puzzle piece can be rotated and used to build several different squares.
What are the side lengths of all the possible squares she can build?

7. MATTHEW'S BIRTHDAY (coef. 7)

On a certain day in the year 2025, Matthew said: "The day before yesterday, I was only 9 years old. But in 2026, I will turn 12."
What is Matthew's date of birth?

8. TWO VASES (coefficient 8)



When a large vase is placed on the table and a small one on the floor, the distance between the tops of the two vases is 120 cm.
If the large vase is placed on the floor and the small one on the table, the distance between the tops of the two vases is only 90 cm.
What is the height of the table?

END for CM PARTICIPANTS

Problems 9 to 18: beware! For a problem to be completely solved, you must give both the number of solutions, AND give the solution if there is only one, or give any two correct solutions if there are more than one. For all problems that may have more than one solution, there is space for two answers on the answer sheet (but there may still be just one solution).

9. MAHDIA (coefficient 9)
The Tunisian city of Mahdia was built in 916 by El Mahdi who made it the capital of Tunisia.

$$\begin{array}{r} \text{MAHDI} \\ +\ \text{BUILT} \\ \hline =\ \text{MAHDIA} \end{array}$$

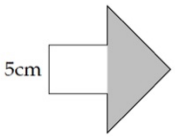
In this addition, different letters always replace different digits, and the same digit is always replaced by the same letter. Furthermore, the first digit of a multi-digit number cannot be a 0.
What is the value of MAHDIA?

10. SQUARE OF THE YEAR (coef. 10)

5	a	b	→ 2025
c	5/3	d	→ 2025
e	f	25	→ 2025
↓ 2025	↓ 2025	↓ 2025	

The numbers a, b, c, d, e, and f are integers other than 5 and 25, and all different from one other.
They are all factors of 2025. The product of the three numbers in each row and column is equal to 2025.
Complete the square.

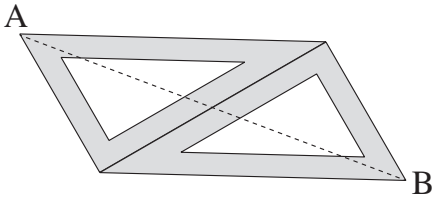
11. ARROW PAVING (coefficient 11)



We tile the plane with the shape above. The lengths are not necessarily correct, but the arrow has symmetry and five right angles.
What is the area of the grey triangle?
Give the answer in cm^2 rounded to the nearest hundredth.

END for C1 PARTICIPANTS

12. TWO SET SQUARES (coefficient 12)



Matthew has two identical set squares whose right-angle sides measure 18 cm and 24 cm. He arranges these set squares as shown in the figure, placing the two 24 cm sides in contact.
What is the distance AB?
Give the answer in cm, rounded to the nearest tenth, and if necessary, take $\sqrt{13}$ to be 3.606.

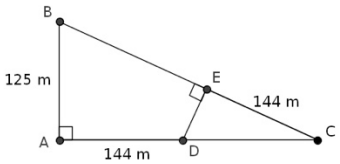
13. THE COLLECTION (coef. 13)
Matilda collects postage stamps.
When asked how many she has, she replies:
"If you add 25 to my number of stamps, you get the square of a whole number, and if you subtract 26 from my number of stamps, you also get a square."
How many stamps does Matilda own?

14. THREE AGES (coefficient 14)
Three members of a family meet for the youngest's birthday.
One of them suddenly says, "If we add the product of the other two people's ages to each of our ages, we get 969, 384, and 256."
If the product of the three people's ages is 8640, what will this product be one year later?

END for C2 PARTICIPANTS

15. DICE (coefficient 15)
Dee definitely likes dice. With a determined gesture, he rolled six dice (six equiprobable sides, values ranging from 1 to 6) and calculated the average. He rolled another die and found that the resulting value was strictly greater than the average of the first six dice.
What was the probability of this happening?
Give the answer as an irreducible fraction.

16. RICH PACTOLUS' PLOT (coef. 16)



Distances are in metres.
Richard Pactolus owns a plot of land divided into two parcels.
Give the area of the plot in m^2, if necessary rounded to the nearest m^2.

END for L1, GP PARTICIPANTS

17. TRIANGULATION POINT (coef. 17)
We have a triangle ABC with sides AB = 6, BC = 5, and CA = 4.
Taking vertex A as the origin of an orthonormal coordinate system and (AB) as the abscissa axis, with point C above the abscissa axis, give the approximate values of the coordinates of the interior point P of the triangle, which is located at distances from the sides proportional to the lengths of these sides.
Give the approximate values to the nearest thousandth, and if necessary, take $\sqrt{7}$ as 2.646.

18. QUARTER-REGULAR POLYHEDRON (coefficient 18)
A polygon is said to be quarter-regular if all its vertices are identical, in the sense that for any pair of vertices, there exists an isometry (not necessarily direct) that maps the vertices onto one another and maps the polygon onto itself. A polyhedron is said to be quarter-regular if each of its faces is a quarter-regular polygon and if all its vertices are identical in the previous sense. Paul has a quarter-regular polyhedron that is not a right prism and that has edges of three different lengths.
How many vertices, edges, and faces does the polyhedron have?

END for L2, HC PARTICIPANTS