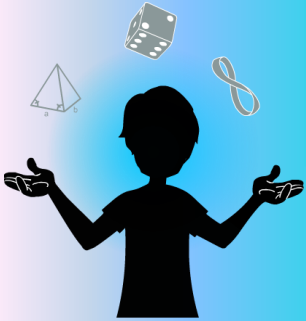


# PUZZLING CARTOON

- IN SHAPE -



AMAZINGMATHS

## Materials :

- Video of the puzzle
- Sheets of paper
- Pencils

## The puzzle

At the school of Mathville, the students have found a new game to play at recess. They draw shapes, like these, on the ground and each student places himself on a different region. They must then give a hint about their position, and another student must determine which region each person has chosen. Allen, Blaise, Pascal, Denise, Estelle, Sophie and Germain invite you to play a game with them. They draw this figure using the three following shapes: a triangle, a circle and a square. They give you the following hints:

1. Allen says: My region belongs to only one shape.
2. Blaise says: Mine belongs to the three shapes.
3. Pascal is moody and refuses to talk.
4. Germain says: My region is within the circle.
5. Sophie announces: My region is not within a polygon.
6. Estelle says: My region is in the circle and the triangle.
7. Denise says: My region is in the triangle, but not in the square.

Allen says: My region belongs to only one shape.

Blaise says: Mine belongs to the three shapes.

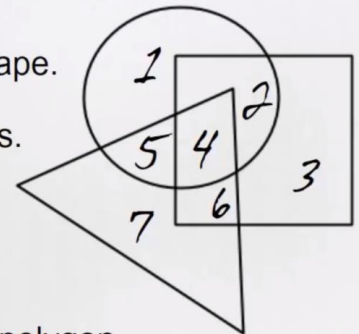
Pascal is moody and refuses to talk.

Germain says: My region is within the circle.

Sophie announces: My region is not within a polygon.

Estelle says: My region is in the circle and the triangle.

Denise says: My region is in the triangle, but not in the square.



Can you overcome the challenge and find which region each person has chosen?



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SCIENCES ET MATHÉMATIQUES EN ACTION



# PUZZLE SOLUTION



## The answer:

Allen (3), Blaise (4), Pascal (6), Germain (2), Sophie (1), Estelle (5) and Denise (7).

## First solution:

A first way to look at the problem is to analyze the hints to find the obvious pieces of information. This is probably the reasoning the students will use.

At the first reading, we find that Pascal chose region 4, because it is the only region that belongs to the three shapes.

Then, we determine that Sophie chose region 1, because it is the only one that is not in a polygon. By reading the hints a second time, we find that Estelle's region is 5, because region 4 is already taken and that they are the only two that belong to the circle and the triangle.

This result allows us to find Denise's region, then Allen's, Germain's and finally Pascal's.

So, we found the answer: Allen (3), Blaise (4), Pascal (6), Germain (2), Sophie (1), Estelle (5) and Denise (7).

## Second solution:

To solve the puzzle in another way, we may draw a table like this one:

Name	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Allen		X		X	X	X	
Blaise							
Pascal							
Germain							
Sophie							
Estelle							
Denise							

We can use this table by eliminating each box that is not possible. For example, the first hint is: "Allen says: My region belongs to only one shape". Since the boxes 1, 3 and 7 are the only ones that correspond to this criterion, we eliminate the other regions in Allen's row.

When there is only one possibility, we circle the box and we eliminate the region for all the other people. When Blaise says, "My region belongs to the three shapes", there is only region 4 that corresponds to that criterion, so we are sure that Blaise chose region 4, and nobody else did.

Name	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Allen		X			X	X	
Blaise	X	X	X	O	X	X	X
Pascal				X			
Germain				X			
Sophie				X			
Estelle				X			
Denise				X			

The final table should look like this one. The small number indicates the hint that gave us this information:

Name	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Allen	X <sub>5</sub>	X <sub>1</sub>	O <sub>7</sub>	X <sub>1</sub>	X <sub>1</sub>	X <sub>1</sub>	X <sub>7</sub>
Blaise	X <sub>2</sub>	X <sub>2</sub>	X <sub>2</sub>	O <sub>2</sub>	X <sub>2</sub>	X <sub>2</sub>	X <sub>2</sub>
Pascal	X <sub>5</sub>	X <sub>7</sub>	X <sub>7</sub>	X <sub>2</sub>	X <sub>6</sub>	O <sub>7</sub>	X <sub>7</sub>
Germain	X <sub>5</sub>	O <sub>7</sub>	X <sub>4</sub>	X <sub>2</sub>	X <sub>6</sub>	X <sub>4</sub>	X <sub>4</sub>
Sophie	O <sub>5</sub>	X <sub>5</sub>	X <sub>5</sub>	X <sub>2</sub>	X <sub>5</sub>	X <sub>5</sub>	X <sub>5</sub>
Estelle	X <sub>5</sub>	X <sub>6</sub>	X <sub>6</sub>	X <sub>2</sub>	O <sub>6</sub>	X <sub>6</sub>	X <sub>6</sub>
Denise	X <sub>5</sub>	X <sub>7</sub>	X <sub>7</sub>	X <sub>2</sub>	X <sub>6</sub>	X <sub>7</sub>	O <sub>7</sub>

This way, we end up with the same solution than with the first method.