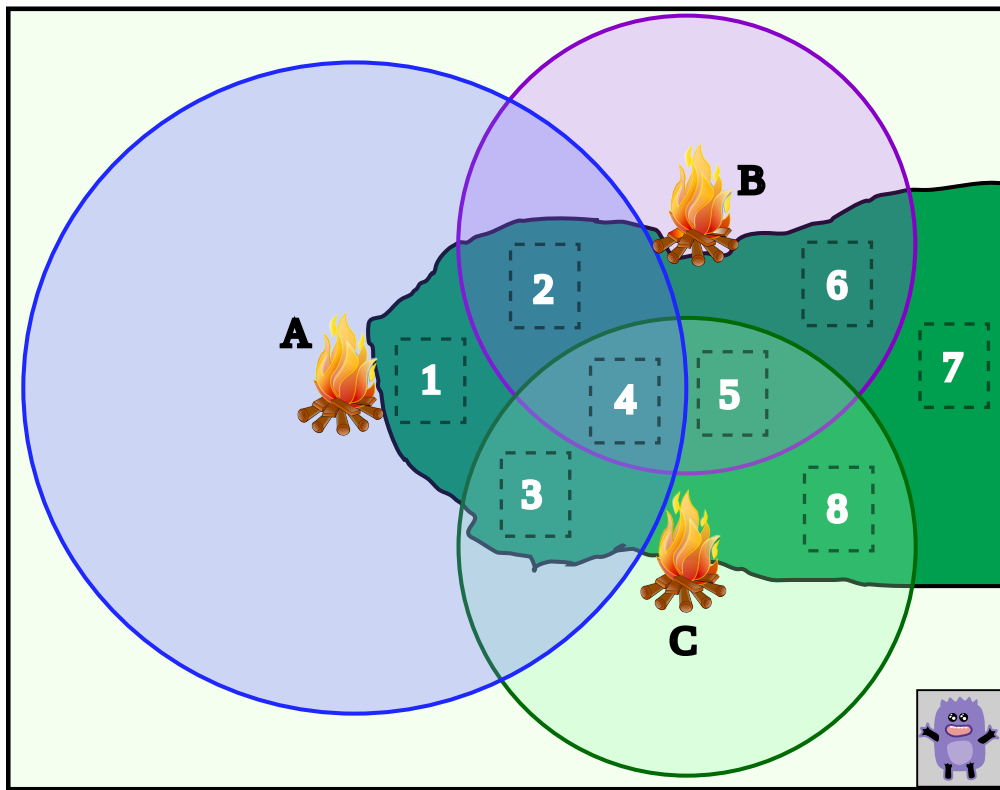




Visible bonfires



Scary Monster lives in the forest. The circles on the map show the locations where Scary can see the light from each bonfire. Depending on which lights it can see, Scary knows if it is in location 1, 2, 3, 4, 5, 6, 7, or 8.



QUESTION

Scary can see the light from bonfires B and C. It can't see the light from bonfire A.
Where is Scary on the map?

1 2 3 4 5 6 7 8



Answer

The correct answer is 5.

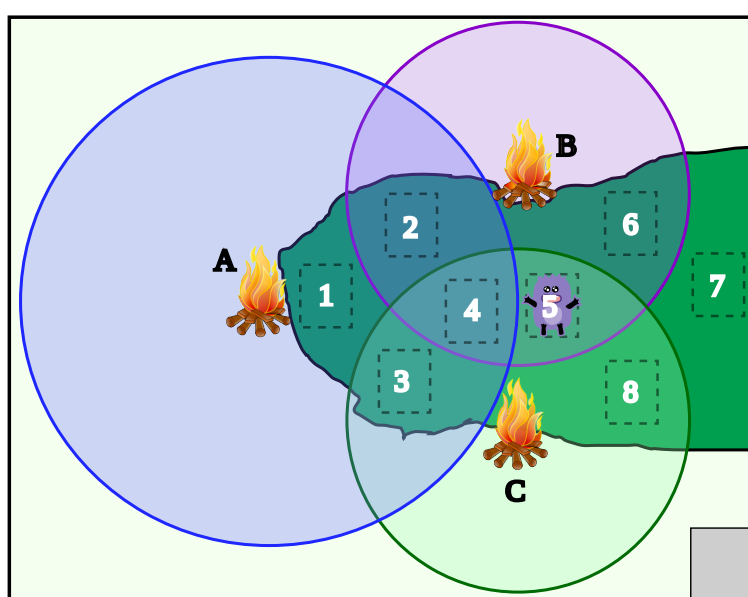
Explanation of the answer

Scary can see the light from bonfire B, so it must be inside circle B.

Scary can see the light from bonfire C, so it must be inside circle C.

Scary can not see the light from bonfire A, so it must not be inside circle A.

Only one location on the map is inside B and C but outside A, and that is the correct answer.



Connection to computational thinking

Logic: This task is an example of a logic problem in the form of a Venn diagram. With three sets, and two possibilities for each set (“in” or “out”), there are eight (2^3) possible different places that Scary could be. Solving this task requires three pieces of information (“in” or “out” for each of the three sets).

Decomposition: This task is an example of how to solve a problem by *breaking into parts*. Each of the three circles can be considered in any order for whether Scary is in that circle, and the answer can be found by combining the results from each.

Algorithms: To a lesser extent, solving this task can require one to *invent an algorithm*. Students can follow a step-by-step process: start with all locations, eliminate the locations that do not satisfy the first condition (“in” or “out” of the first circle), apply the next condition, eliminate locations that no longer fit, and repeat until a solution is found. This demonstrates how complex problems can be solved by iteratively repeating a simple sequence of actions.





Ghoul sweeper



This Halloween logic game starts with a grid of blank squares. If you click on a square, it changes to be either a ghou or a number. If it is a number, it tells us how many of the eight neighbouring squares have ghouls in them.

The goal of the game is to uncover all squares that do NOT contain ghouls. The player has finished the game on the right.

		1	1	1	
	1	3		2	
	1			2	
	1	2	2	1	

In the unfinished game below, we can see some numbers and one ghoul. We are told that there is another ghoul in the picture.

		A	1	B	
		1	2	1	
			1	C	
			D		

QUESTION

In which square, marked with A, B, C or D, is the other ghoul?



Answer

The correct answer is **B**.

Explanation of the answer

Could it be A? In the square below the square marked “A” we have a “1”. We are shown that there is a ghoule below that. So “1” indicates that ghoule and the square marked “A” cannot contain another ghoule.

Could it be C or D? In the square to the left of the “C” and above the “D” we have a “1”. And next to that is a ghoule. So “1” indicates that ghoule and the squares marked “C” and “D” cannot contain another ghoule.

Could it be B? The square marked “B” has two neighbours with a “1”. This square “B” is the only square is a neighbour to these two “1”s. Therefore, the ghoule must be here. Alternatively, one could consider the square with a “2”. If there are two ghoules that are neighbours of this “2”, and one is visible already, then the other must be in at “A”, “B”, or “C”. If we have ruled out “A” and “C” already, then it must be “B”.

