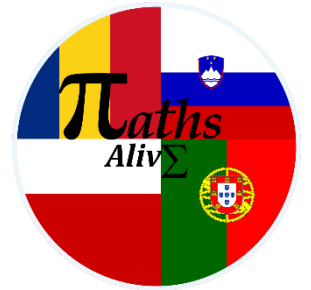


# Estimating the area of an irregular shape

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# Introduction

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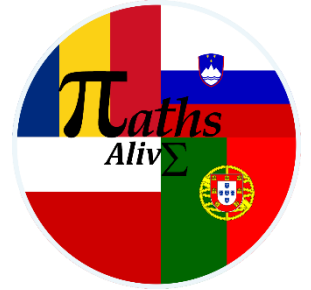
- Area is the quantity that expresses the extent of a two-dimensional figure or shape.
- The area can be measured by comparing the shape to squares of a fixed size, named unit squares.
- In the International System of Units (SI), the standard unit is the square meter ( $\text{m}^2$ ), which is the area of a square whose sides are one meter long.



# Introduction

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- There are several well-known formulas for the areas of simple shapes such as triangles, rectangles, parallelograms, quadrilaterals.
- Using these formulas, the area of any polygon can be found by dividing it into triangles.
- For shapes with curved boundary, calculus is usually required to compute the area.



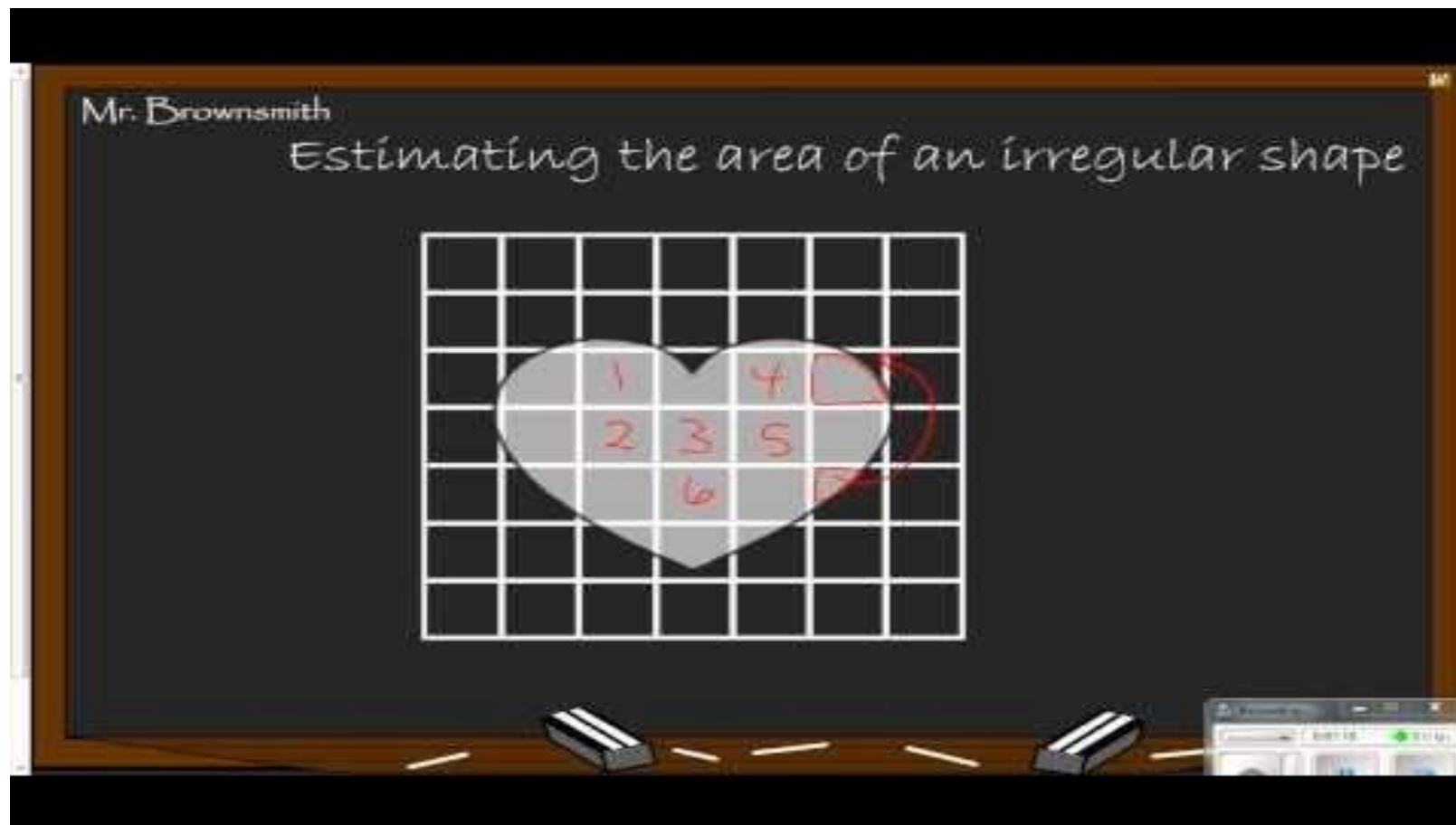
# Introduction

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- For irregular shapes, the area cannot be calculated accurately, only approximate methods can be used.
- Let's watch a short video to learn the easiest way.



# Introduction



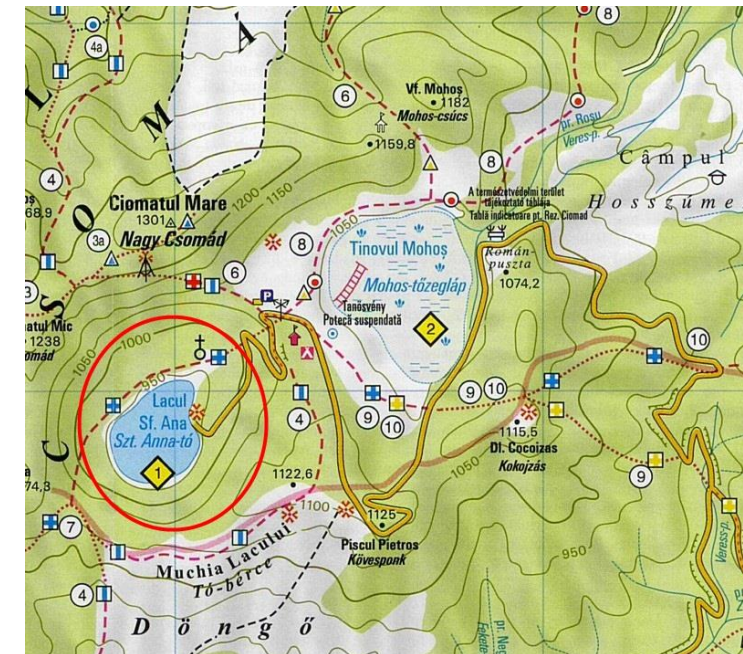
 [Video](#)

# Saint Anne Lake

Romania

Harghita county

Saint Anne Lake





# Saint Anne Lake

- Saint Anne Lake is the only lake in Romania is located in a volcanic crater.
- Together with Mohos-tőzegláp located in adjacent crater, form a Natural Reserve of Mohos.
- Lake Saint Anne is in Csomád Mountains, 55 km of Csíkszereda, but it is near Tusnád Fürdő resort.
- [Video](#)

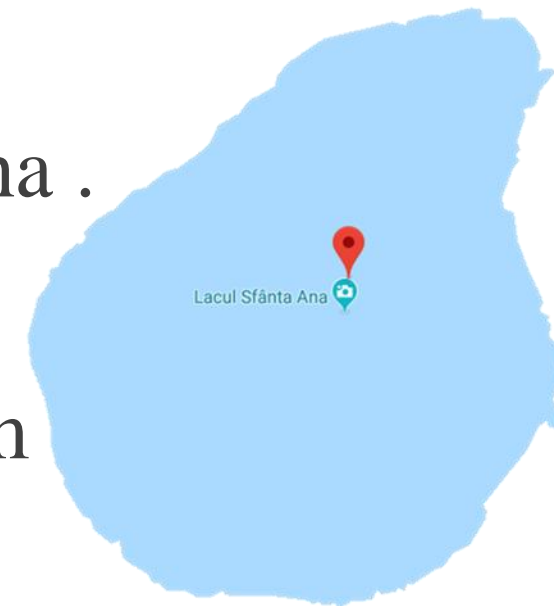




# Saint Anne Lake

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- The lake is at an altitude of 949 m.
- It has an oval form and its surface area is 19.3 ha .
- Walking, we can go around it.
- Specific for the lake is that it does not feed from springs or brooks, but only from precipitation.
- Therefore the degree of mineralization of the water is very low.
- In winter, the lake is covered with a layer of ice of up to 1 m.







# Saint Anne Lake

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➤ Near the lake there is a Roman Catholic chapel dedicated to Saint Anne.

➤ Legend





# 1<sup>st</sup> task

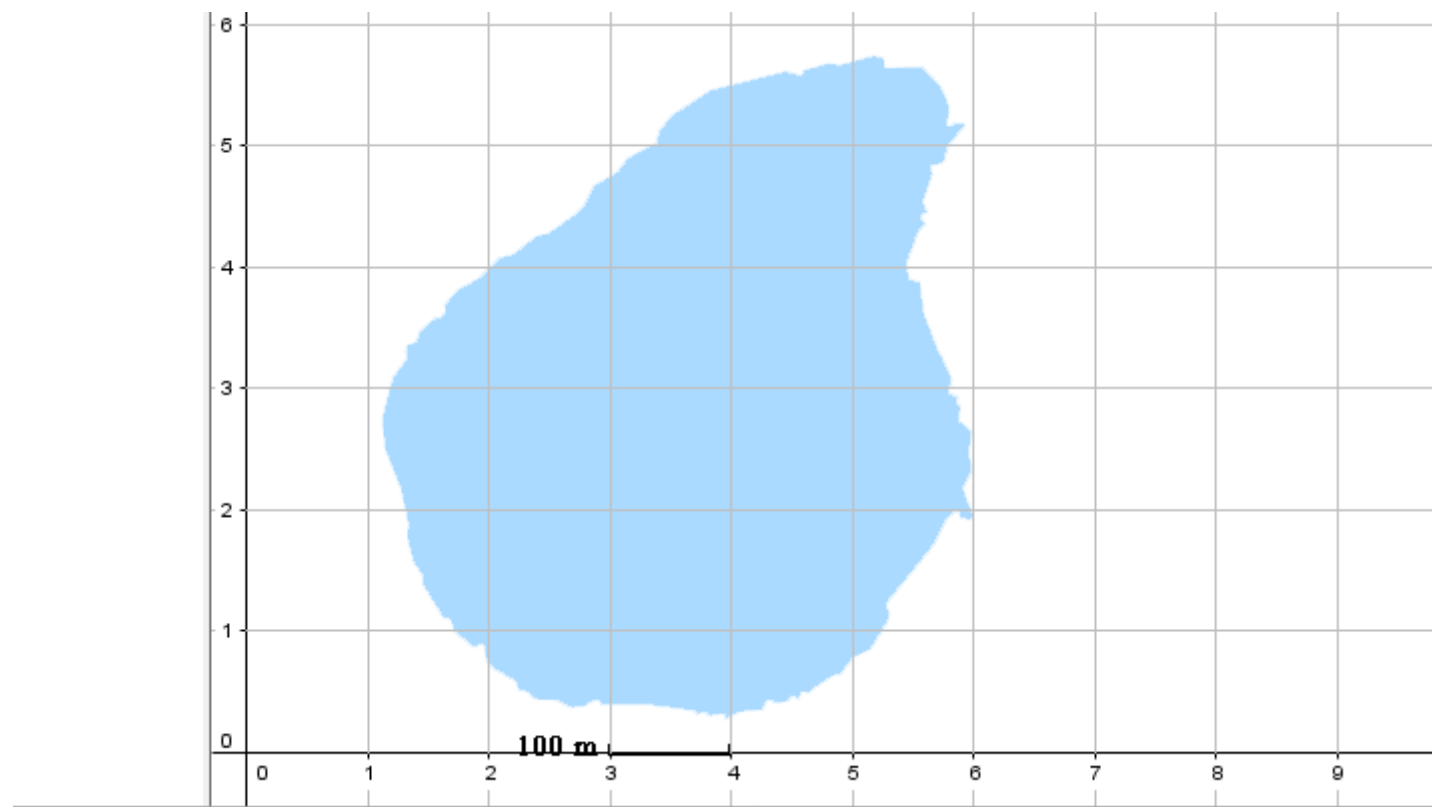
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- Draw a square grid on the Saint Anne Lake's map, and evaluate its area by counting the unit squares.
- The unit square has a side of 100 meters, so one square has an area of 1 hectare.



# 1<sup>st</sup> task





## 2<sup>nd</sup> task

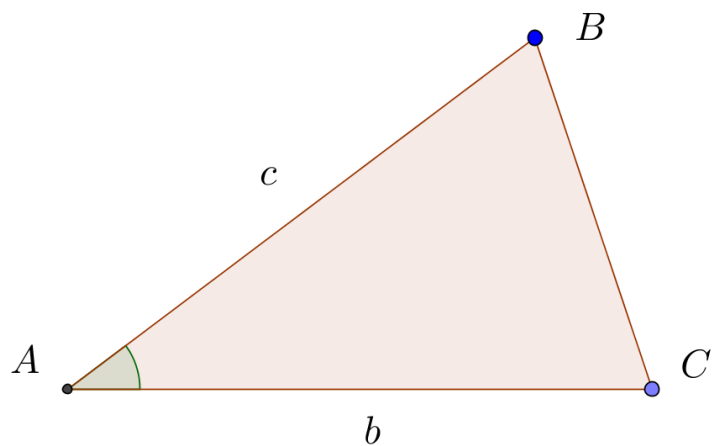
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- Another method is to divide the shape into triangles, and calculate their area.
- The most practical formula gives us the area as half product of two sides of the triangle and the sine of the angle enclosed by them.



# 2<sup>nd</sup> task

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$$A = \frac{b \cdot c \cdot \sin(A)}{2}$$



## 2<sup>nd</sup> task

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- Divide the lake's surface into triangles and calculate the sum of their areas.

# 2<sup>nd</sup> task

