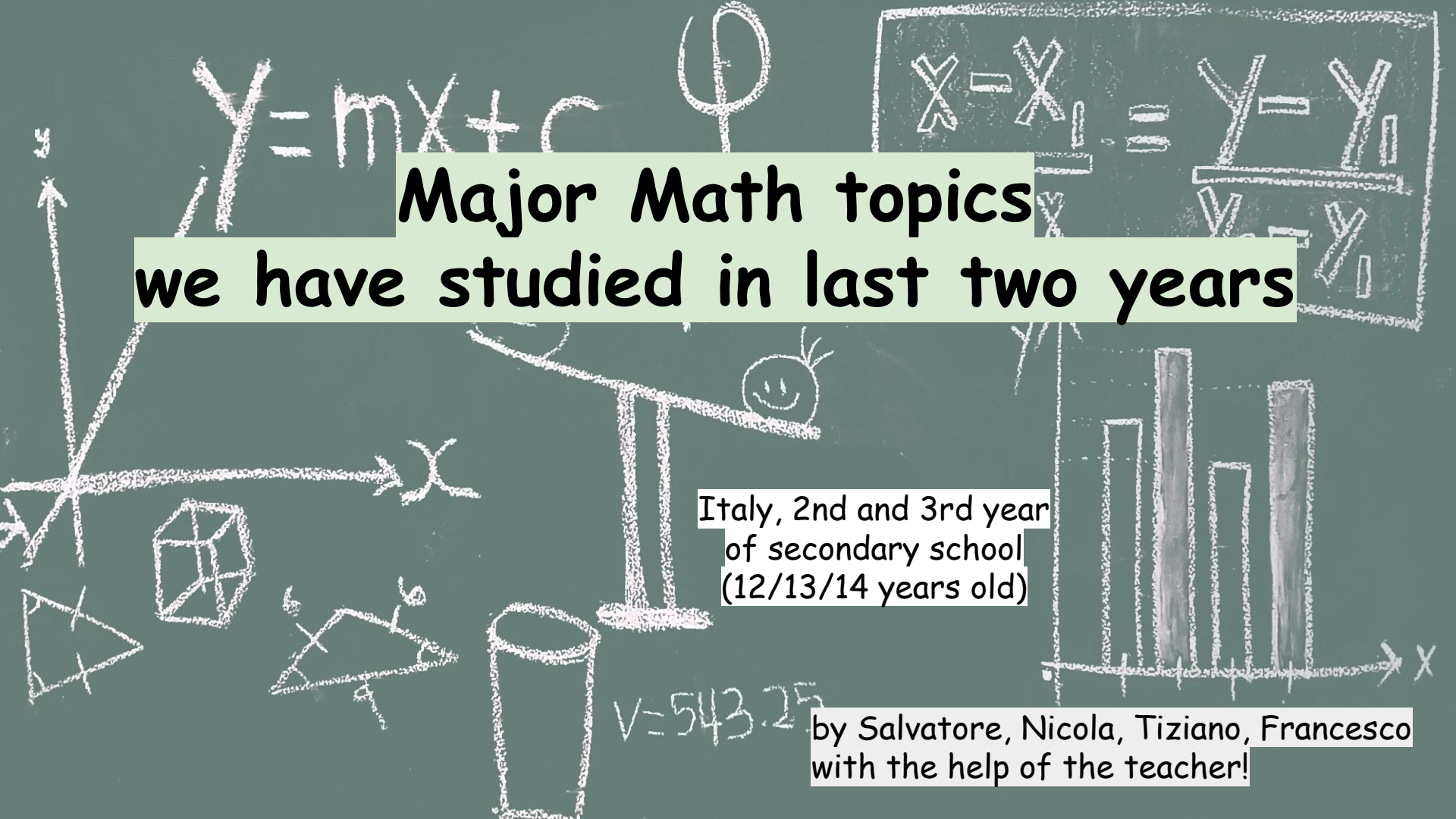
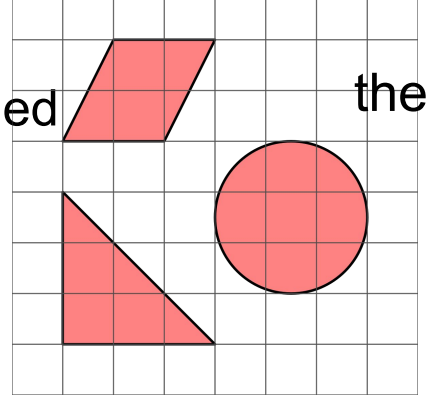
Major Math topics we have studied in last two years



Italy, 2nd and 3rd year of secondary school (12/13/14 years old)

by Salvatore, Nicola, Tiziano, Francesco with the help of the teacher!

The area is the space contained within the figure for example:



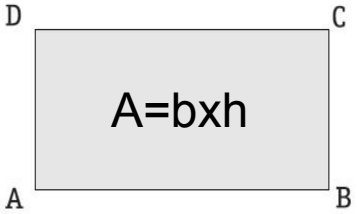
the red space is the area

There are direct and inverse formulas for:

Calculate the area or height knowing the sides

sides or height knowing the area

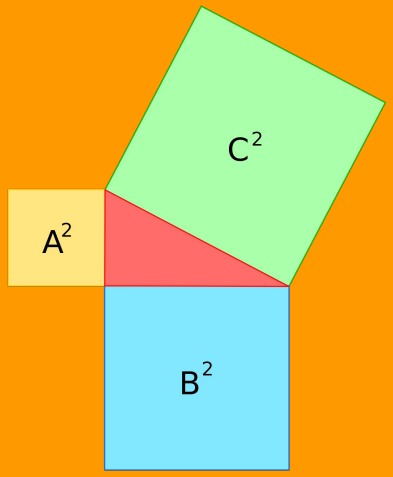
the figure and the main formula is that of the rectangle



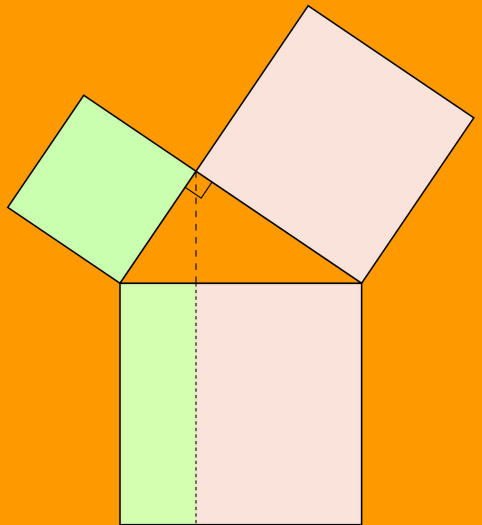
All the others derive from this

The Pythagorean Theorem

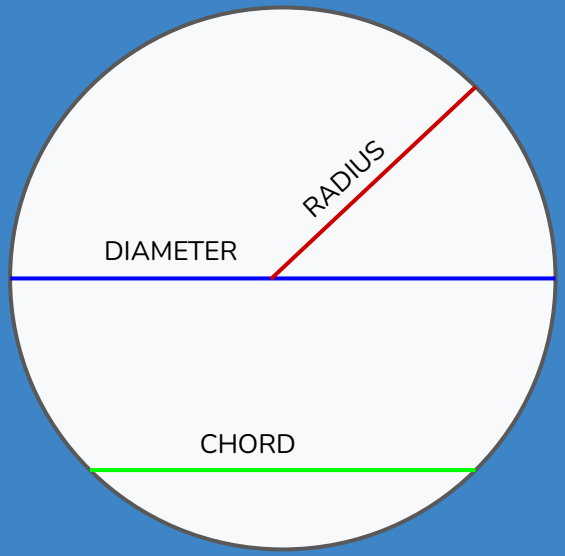
The Pythagorean theorem is one of the most famous theorems in all of geometry, it states that the square built on the hypotenuse of a right triangle is equivalent to the sum of the squares built on the legs of the triangle.



$C^2 = B^2 + A^2$



THE CIRCLE



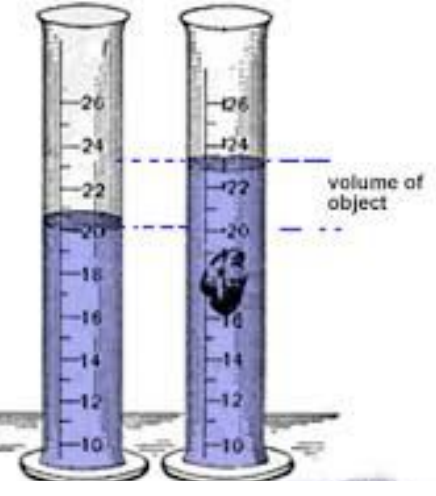
The circle is a set of points that are no more than the radius from the centre.
It has a circumference (set of points equidistant from a point called “the centre”) and an area (area inside the circumference).
We can imagine that the circle is a polygon with infinitely small sides

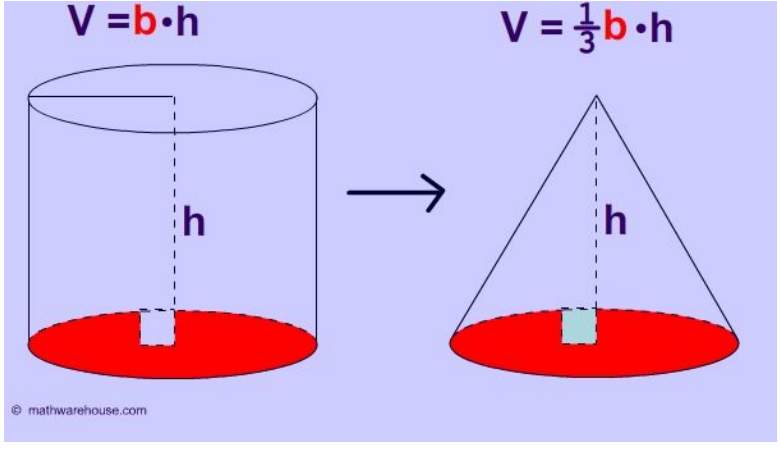
3D FIGURES

Volume
Space occupied by the solid

measure for any object

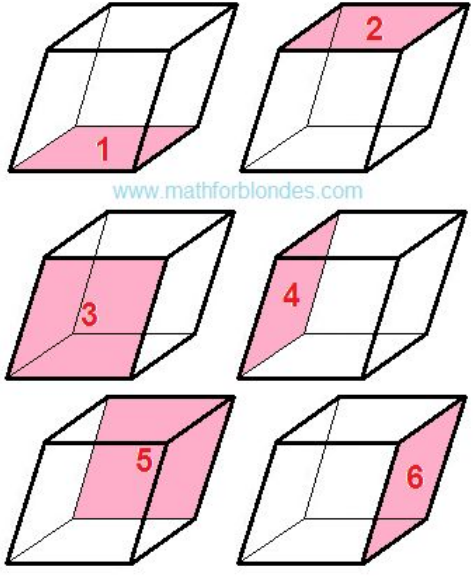
calculation for object of special shapes



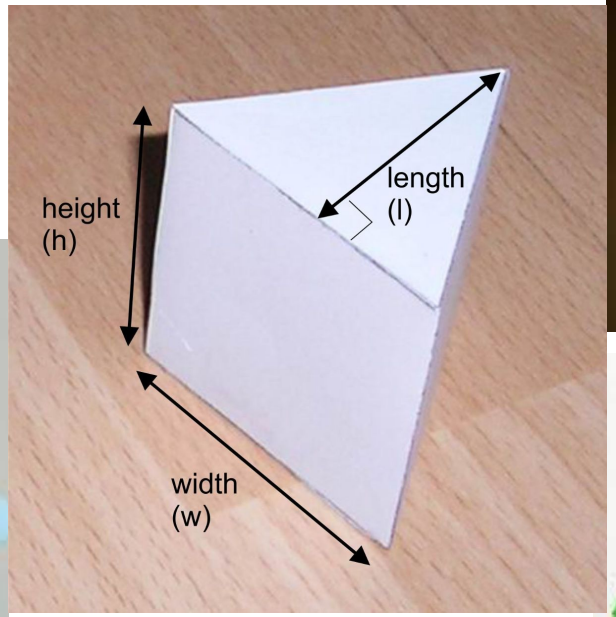


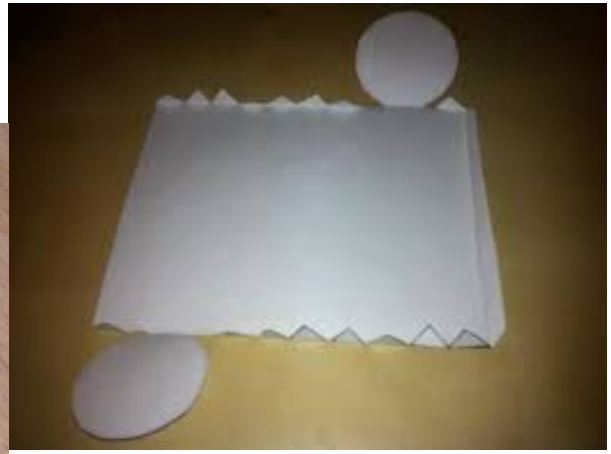
External surface
Surface of his faces

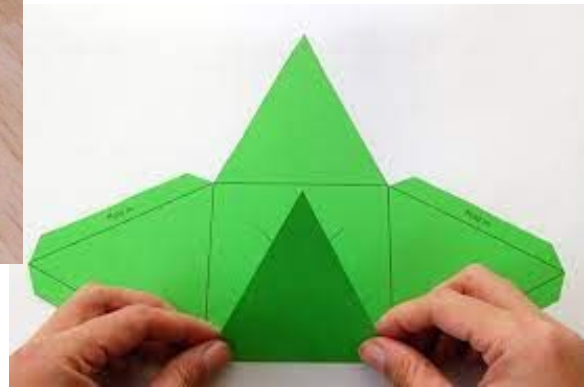
for example, faces of a parallepiped



We construct some of these solids, and we solve problems about them.







PROPORTIONALITY

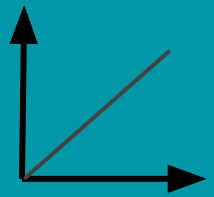
DIRECT

The sides vary in the same way.

The ratio between *y* and *x* is constant.

Proportions are built to solve problems.

The graphic is a straight line passing through the origin.



$y = K \cdot x$

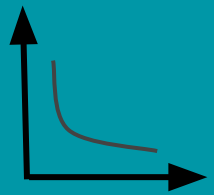
REVERSE

The quantities vary inversely.

The product between *x* and *y* is constant.

Equations of multiplications are constructed to solve problems.

The graphic is a curved line (hyperbole).



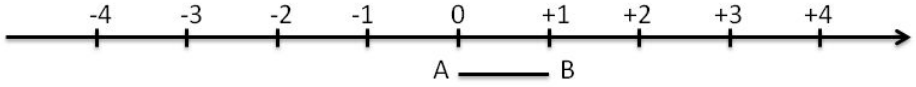
$y \cdot x = K$

Relative numbers

Relative numbers are numbers that can be either greater than zero(0) marked with a +, or less than zero(0) marked with a -.

es. -2+3=+1

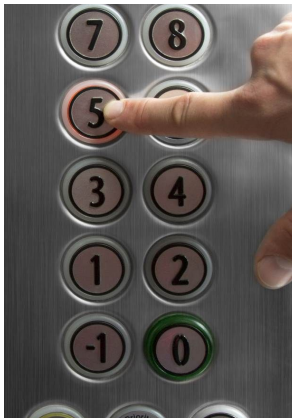
es. +2-5=-3



1° es. We start from -2 and add 3

2° es. We start from +2 and subtract 5

We used relative numbers in daily life.



elevator

thermometer

Relative numbers

When we talk about multiplication or division we have to multiply or divide the numbers and for signs we can use this table:

+ times/divided + = +

+ times/divided - = -

- times/divided - = +

es. $(+5) \cdot (-2) = -10$ $(+2) \cdot (+3) = +6$ $(-10) \cdot (-3) = +30$

$(+6) : (+3) = +2$ $(+10) : (-2) = -5$ $(-12) : (-6) = +2$

of course also with fractions! 

Algebra

We use algebra to write formulas and relationships between quantities

$a^n \times b^n = (a \times b)^n$
$a^n : b^n = (a : b)^n$
$a^n \times a^p = a^{n+p}$
$a^n : a^p = a^{n-p}$
$(a^n)^p = a^{n \times p}$
$a^0 = 1$

We use algebra to solve equations

$$(7 - 3x)2 + x = 5 - 3(5 - x)$$

We use algebra to rappresent curves in the Cartesian plane

$y \cdot x = 24$