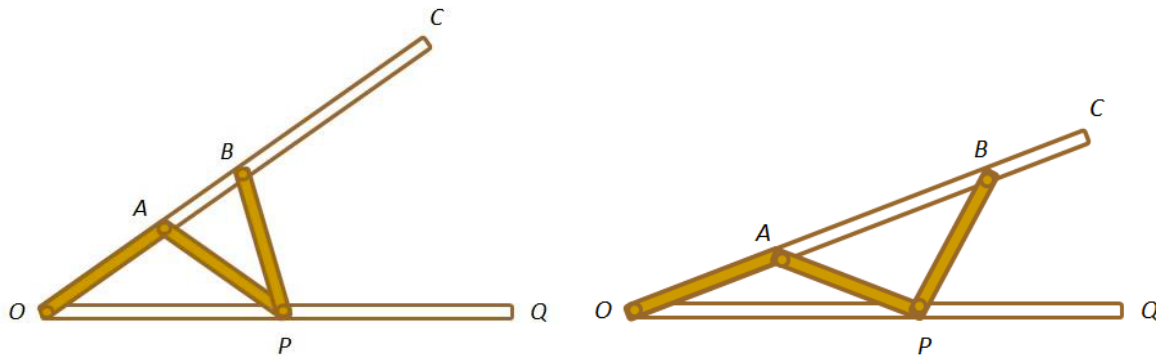


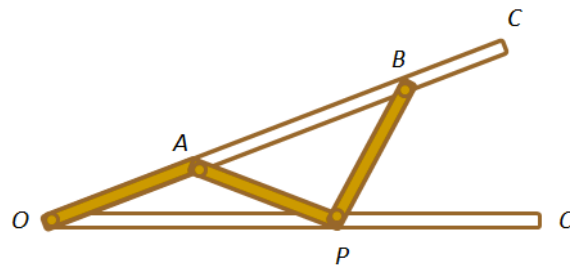
MECHANICAL ANGLE TRISECTOR of E. PASCAL (1588-1651)



ACTIVITY 1

On the right you can see a mathematical machine that was invented by E. Pascal in order to solve one of the unsolved problems of the ancient world that were 'troubling' the mathematicians (and not only them): *trisecting an angle*.

In this machine, the rods OA, AP, PB, have the same length.



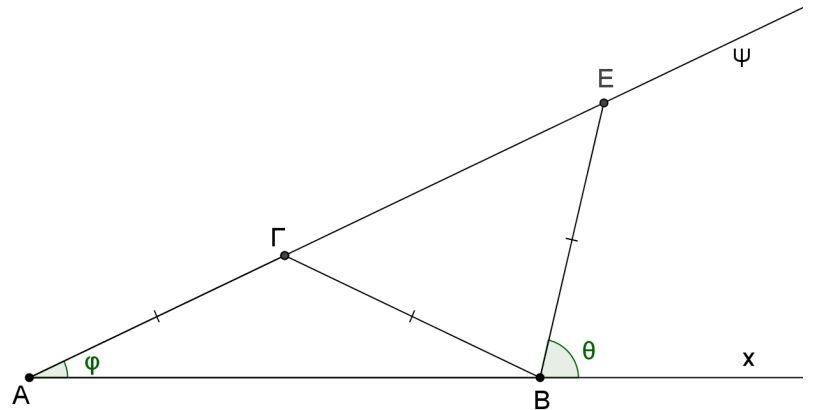
1. Which geometrical shapes and which geometrical properties can you recognize? Explain.
2. Based on your observations, draw the corresponding geometrical shape using your geometrical tools. Describe in detail and accurately the steps for your design.

ACTIVITY 2

1) Your sketch should be similar to the one is shown on the right.

For the sketch on the right it applies that: $AG = BG = BE$.

Find the relationship between the of angles χBE and BAG justifying your opinion.



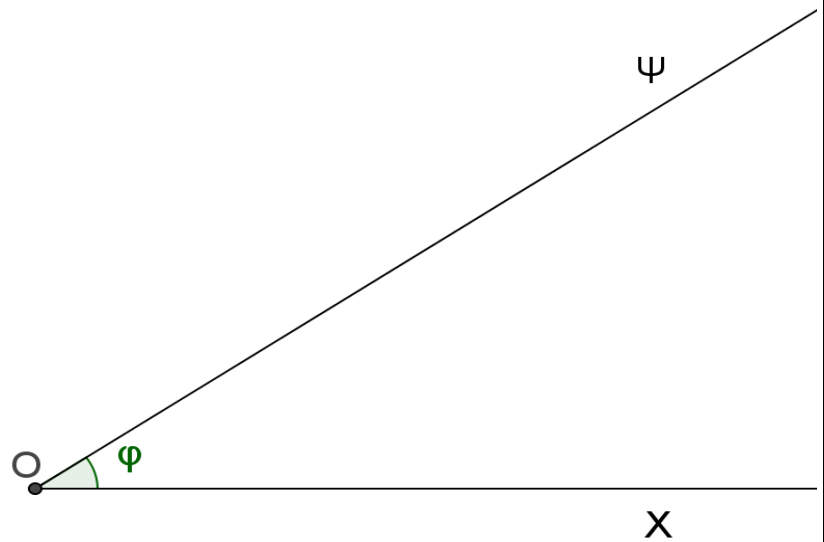
Relationship:

Justification:

ACTIVITY 3

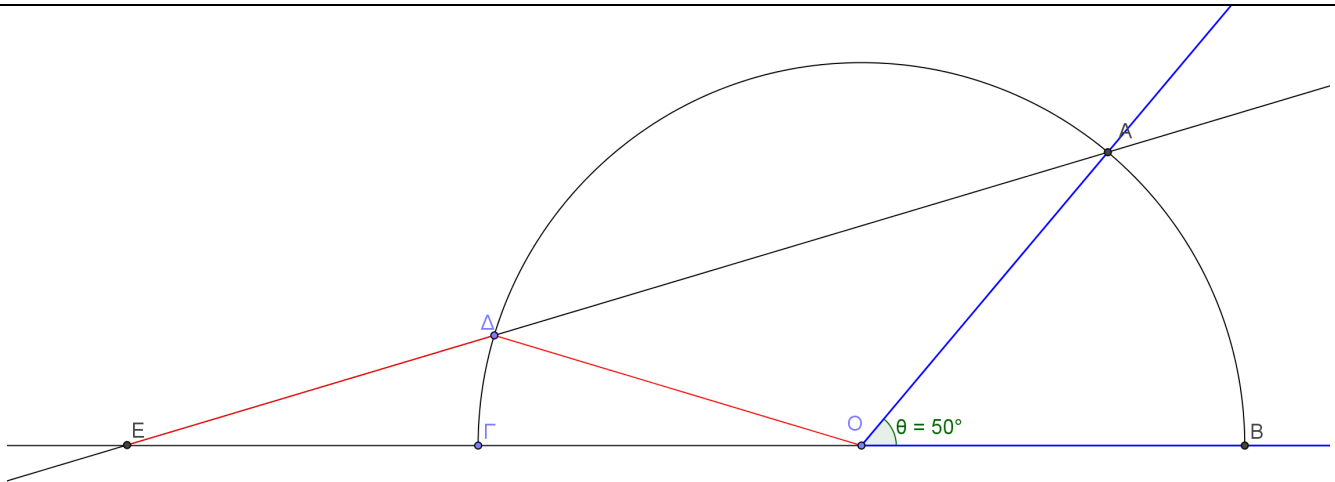
Based on the above, can you divide the angle of the figure into three equal parts?

REMEMBER
 USING ONLY A RULER KAI A
 COMPASS



*If you didn't manage it, go to the next exercise.
 Before you finish you may manage to trisect the angle*

ACTIVITY 4 - IN THE STEPS OF ARCHIMEDES

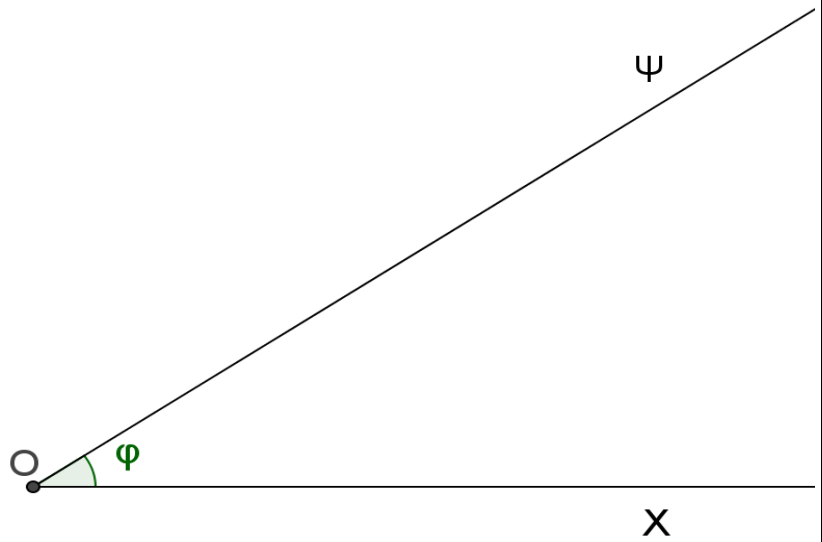


In the figure above the angle $\angle BOA = 50^\circ$ is encircled in a circle with center O and radius OB. The straight line EA intersects the semicircle at point Δ so that $EA = OB$. Calculate the angles of the figure.

Calculations:

ΔΡΑΣΤΗΡΙΟΤΗΤΑ 5

Based on the above, can you divide the angle of the figure into three equal parts?



Describe the procedure step by step:

MECHANICAL ANGLE TRISECTOR Giovanni Ceva (1647-1734)

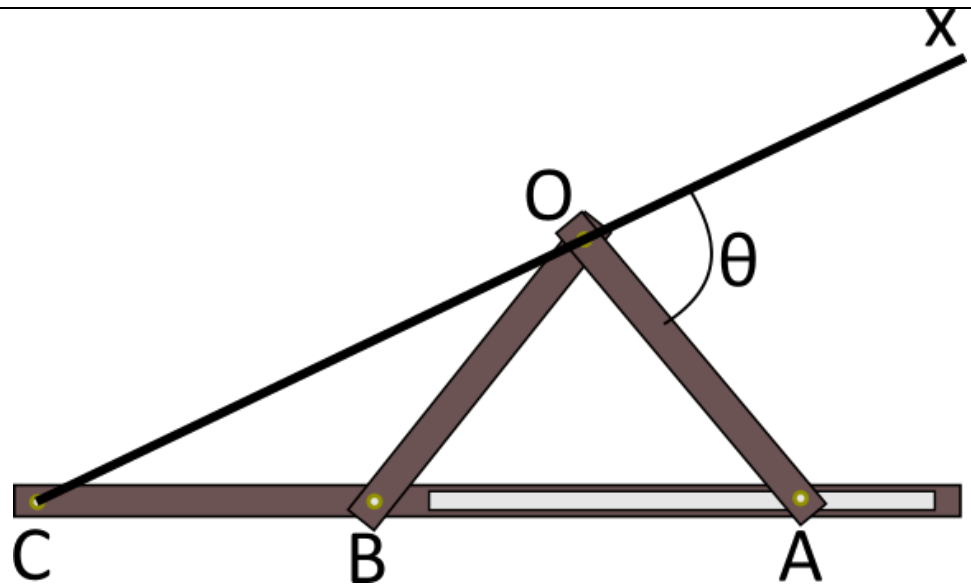
ACTIVITY 6

The figure on the right is a representation of the device made by the Italian mathematician Giovanni Ceva.

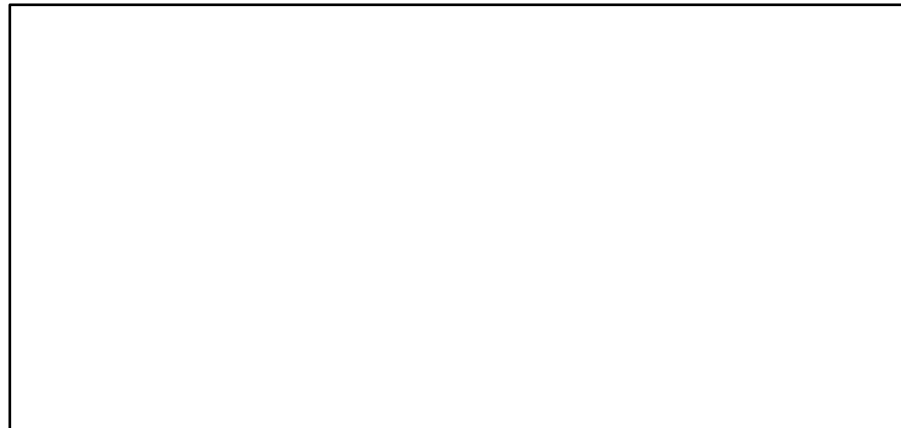
It consists of three rods, $OA=OB$ and CA . The CA rod has a groove where the end point A of the rod OA can be moved on a straight line.

Also, $CB=OB=OA$.

Consider the straight line that joins the points C and O and that $\widehat{COA} = \theta$



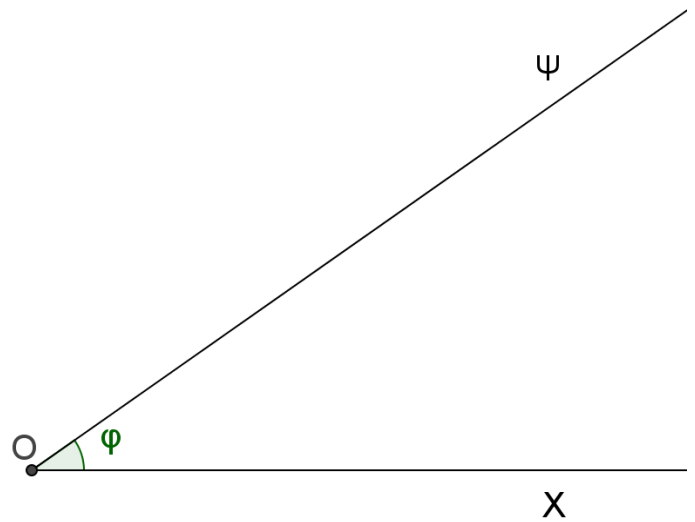
1. Draw with your geometric tools the geometric figure:



2. Recognize and write down all the geometrical shapes of the machine. What properties do they have?
3. Calculate all the angles of the figure.
4. What do you think the above device does?

ACTIVITY 7

Let suppose you have been given the angle on the right and have been asked to trisect it.



Can you use the mechanism of the previous activity and if so, how?
Describe the procedure in steps:

Step 1°

Step 2°

Step 3°

Step 4°

ACTIVITY 8

Draw an angle the size of which is fitting in the size of an A4 page. Trisect the angle using the machine.