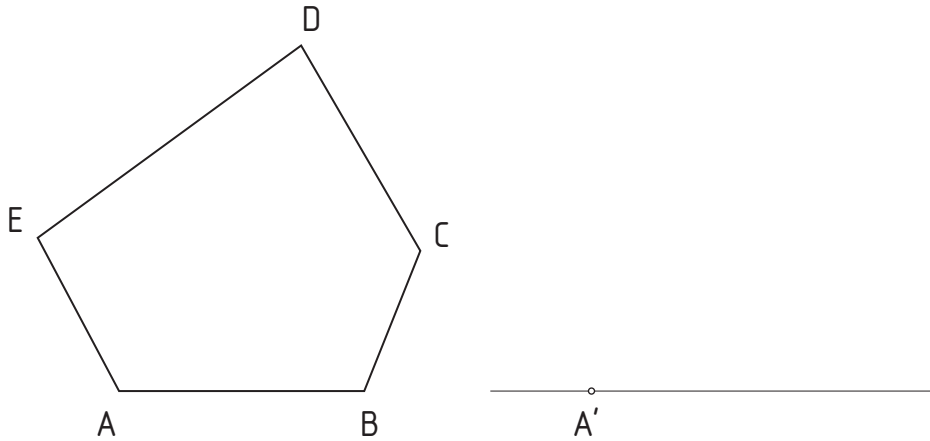
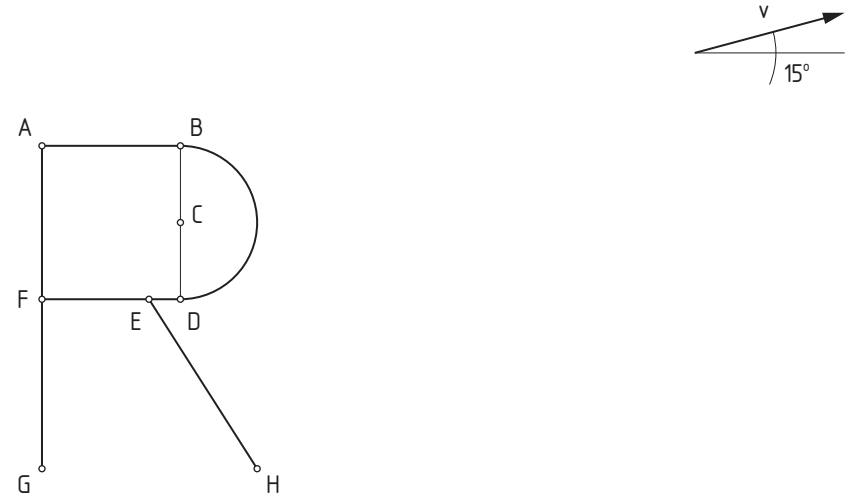


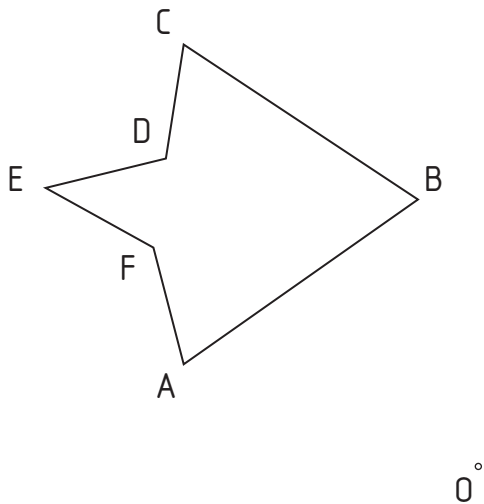
1.- Draw an equal figure to the given **ABCDE** using the triangulation method.



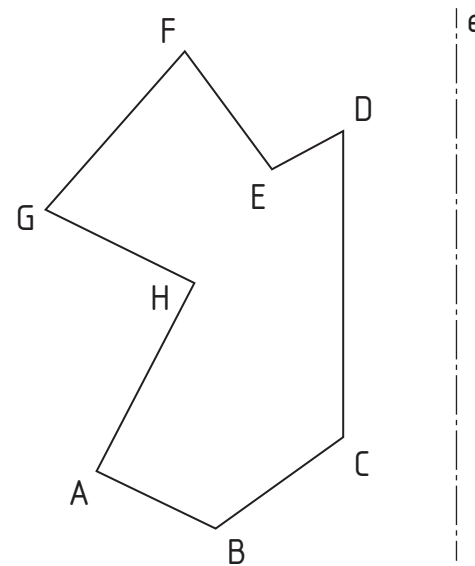
2.- Translate the given figure 40 mm following the direction of **vector v**.



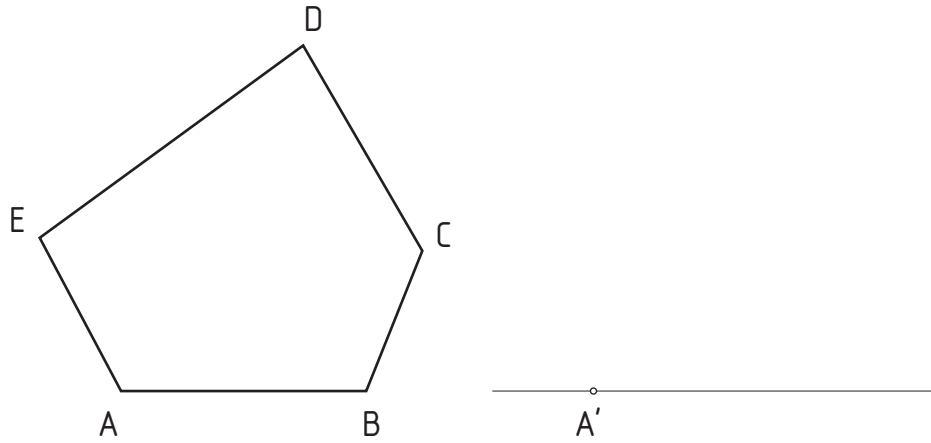
3.- Rotate the given figure **90°** clockwise around the **center O**.



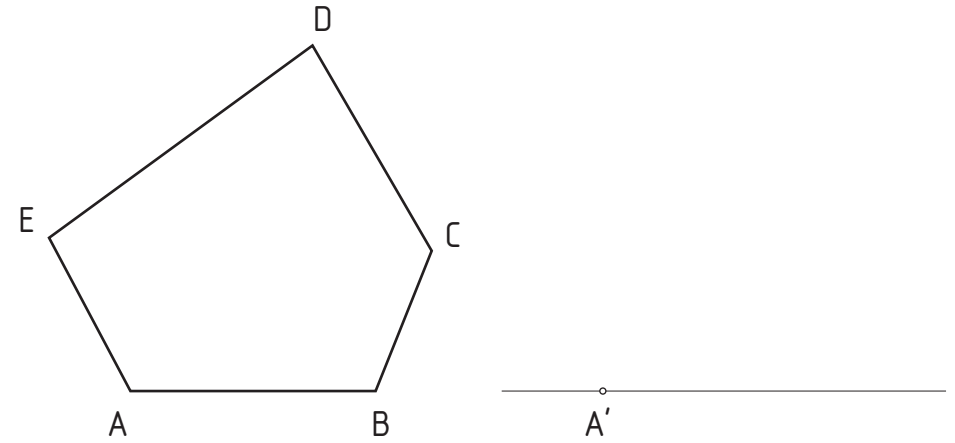
4.- Draw the symmetric figure of the given according to **axis e**.



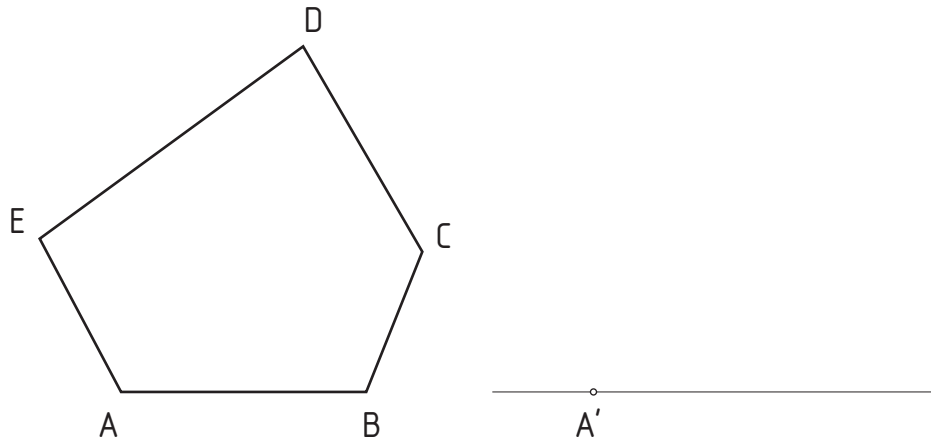
1.- Draw an equal figure to the given **ABCDE** using the triangulation method.



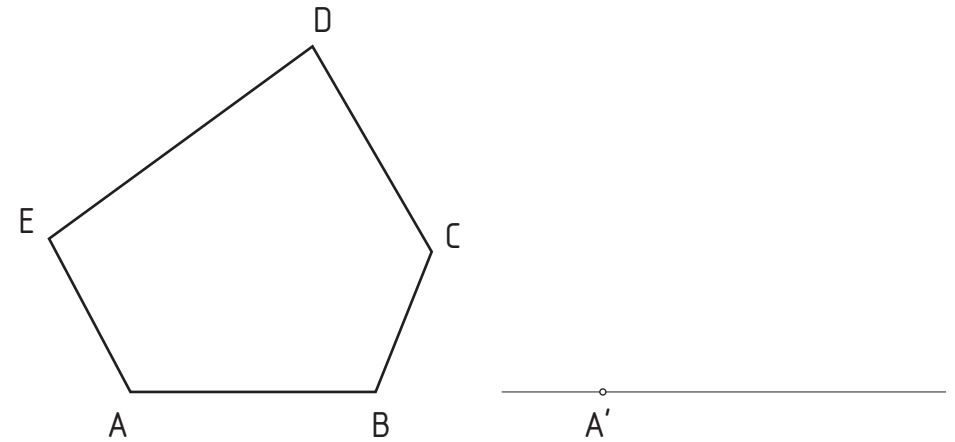
2.- Draw an equal figure to the given **ABCDE** using the radiation method.



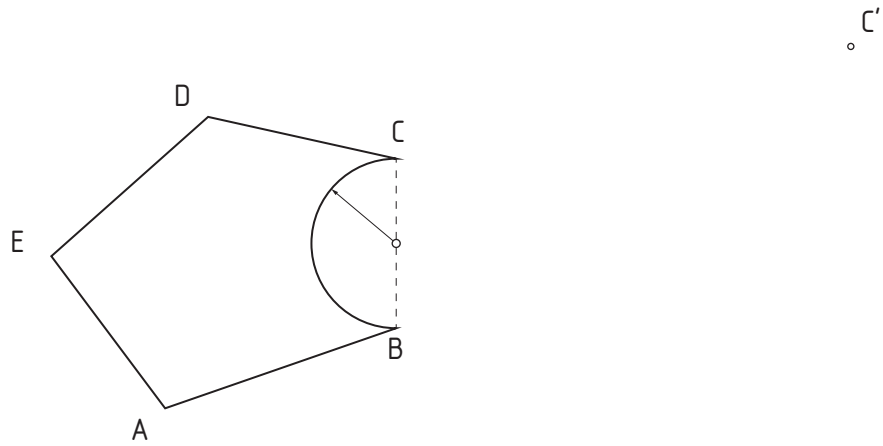
3.- Draw an equal figure to the given **ABCDE** using the perpendicular lines method.



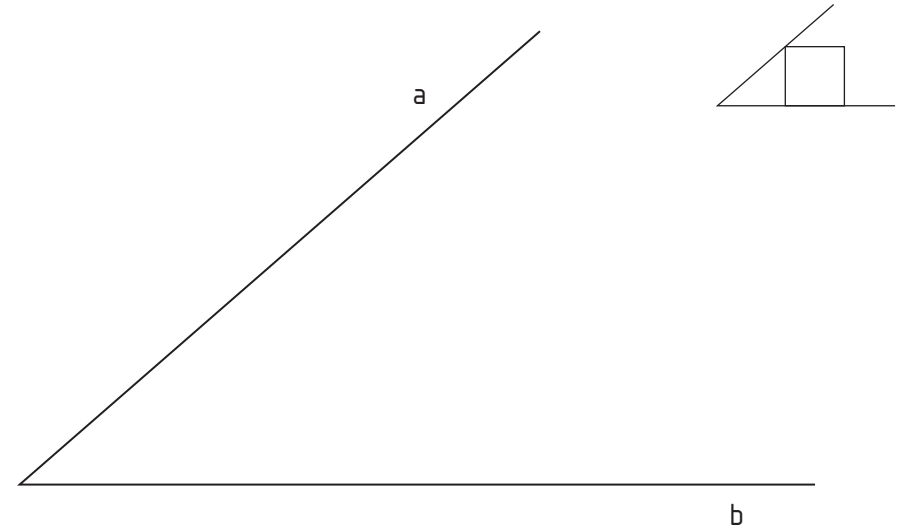
4.- Draw an equal figure to the given **ABCDE** using the copying angles method.



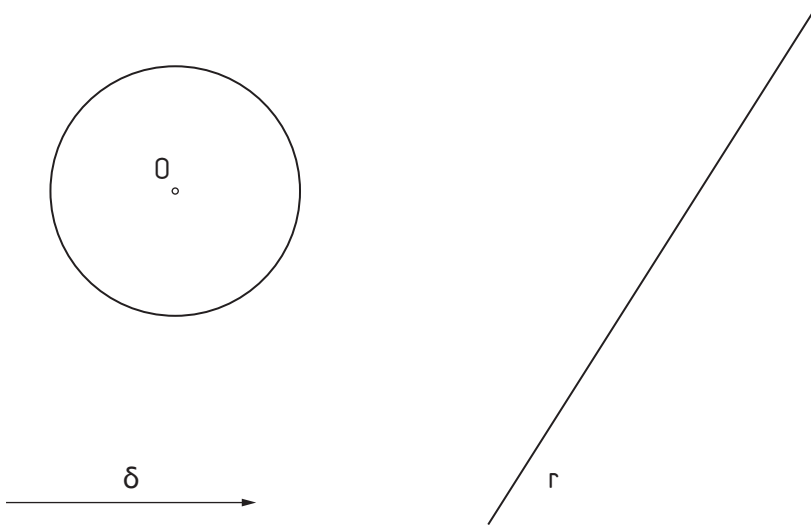
1.- Draw the transformed figure after a translation in which **C** point is transformed in **C'**.



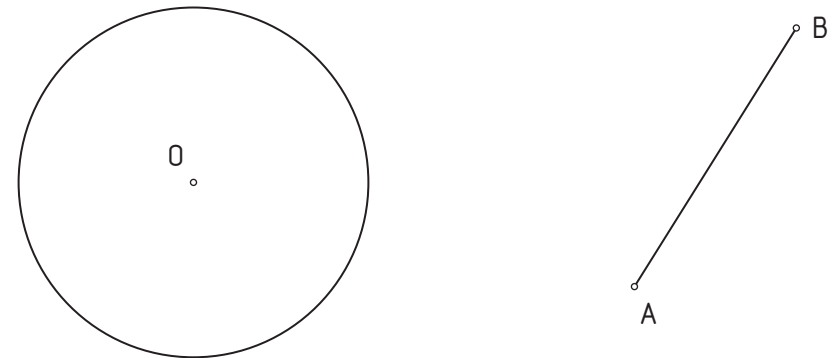
2.- Draw a 35 mm side square that has one of its sides on **b** side and one of its vertices on **a** side.



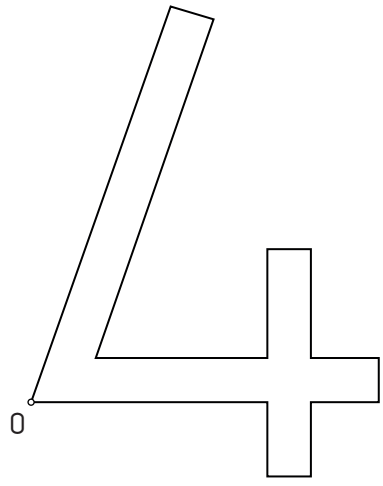
3.- Translate circumference **O** following **direction  $\delta$**  until it is tangent to **line  $r$** .



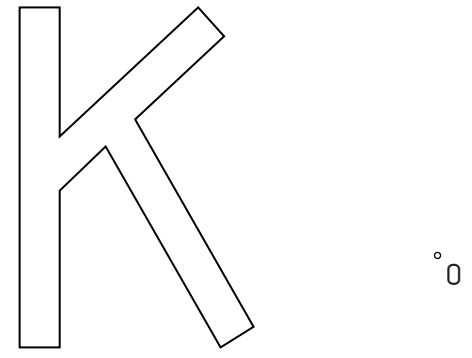
4.- Translate **segment AB** to make it tangent, in its middle point, to **circumference O**.



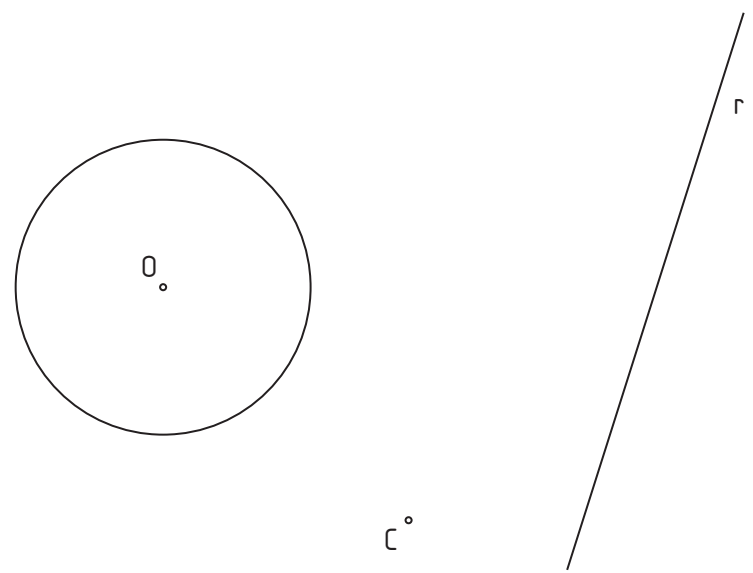
1.- Rotate given figure **90° counterclockwise**, around rotation center **O**.



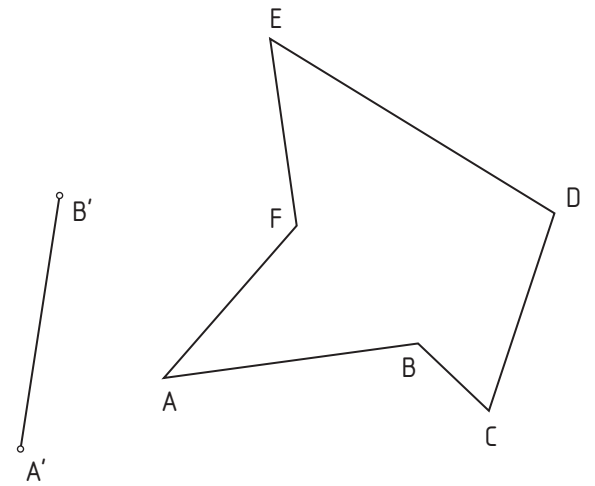
2.- Rotate given figure **120° clockwise**, around rotation center **O**.



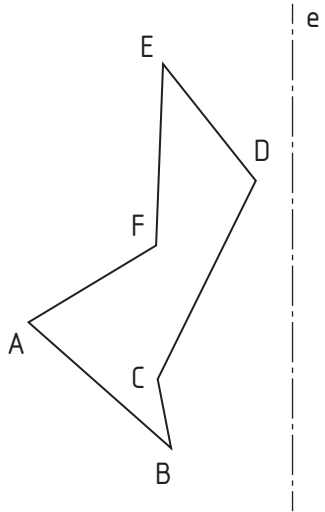
3.- Rotate given circumference **O** around rotation center **C** until it is tangent to line **r**.



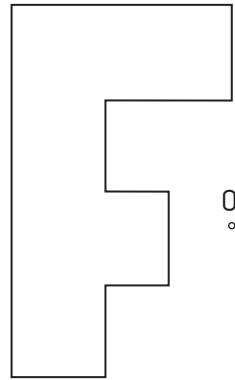
4.- **A'B' segment** is the transformed segment from **AB**. Find the rotation center and angle and trace the transformed figure.



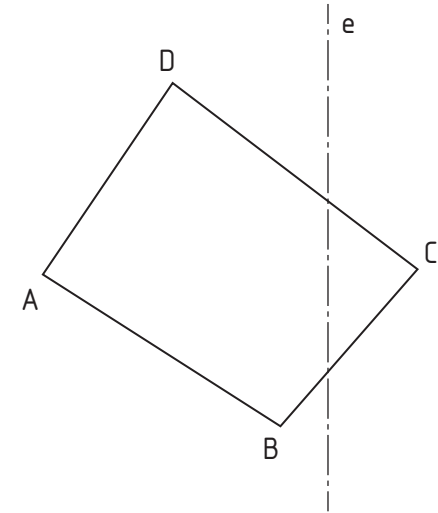
1.- Determine the symmetric figure of the given one according to **axis e**.



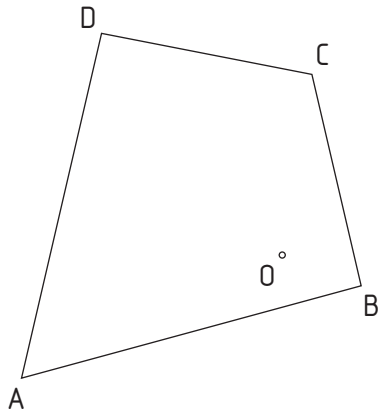
2.- Determine the symmetric figure of the given one according to **center O**.



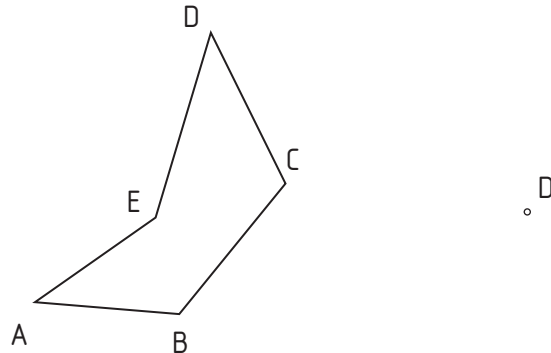
3.- Trace the symmetric quadrilateral of the given one according to **axis e**.



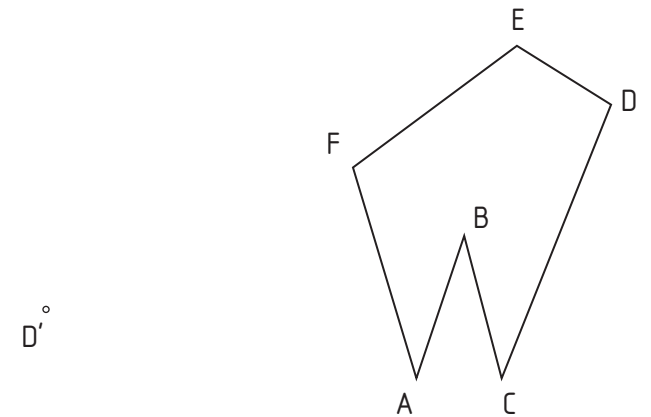
4.- Trace the symmetric quadrilateral of the given one according to **center O**.



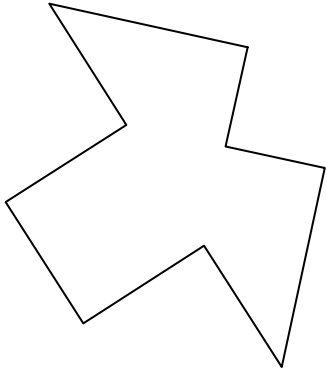
5.- **D** and **D'** dots are symmetric. Find **symmetry axis** and draw the resulting figure.



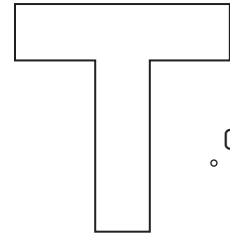
6.- **D** and **D'** dots are symmetric. Find **symmetry center** and draw the resulting figure.



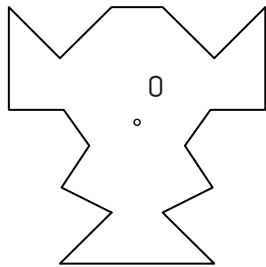
1.- With given similarity center **O**, draw similar figure with **ratio 3/5**.



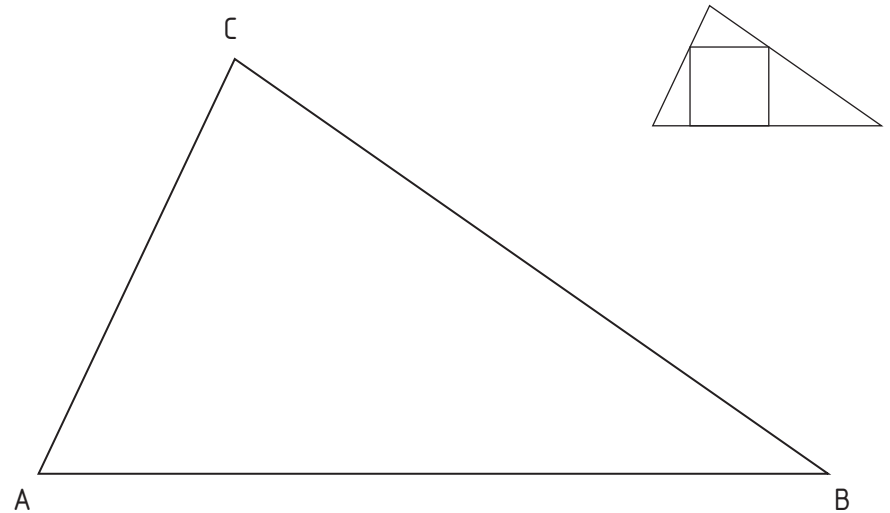
2.- With given similarity center **O**, draw similar figure with **ratio -2**.



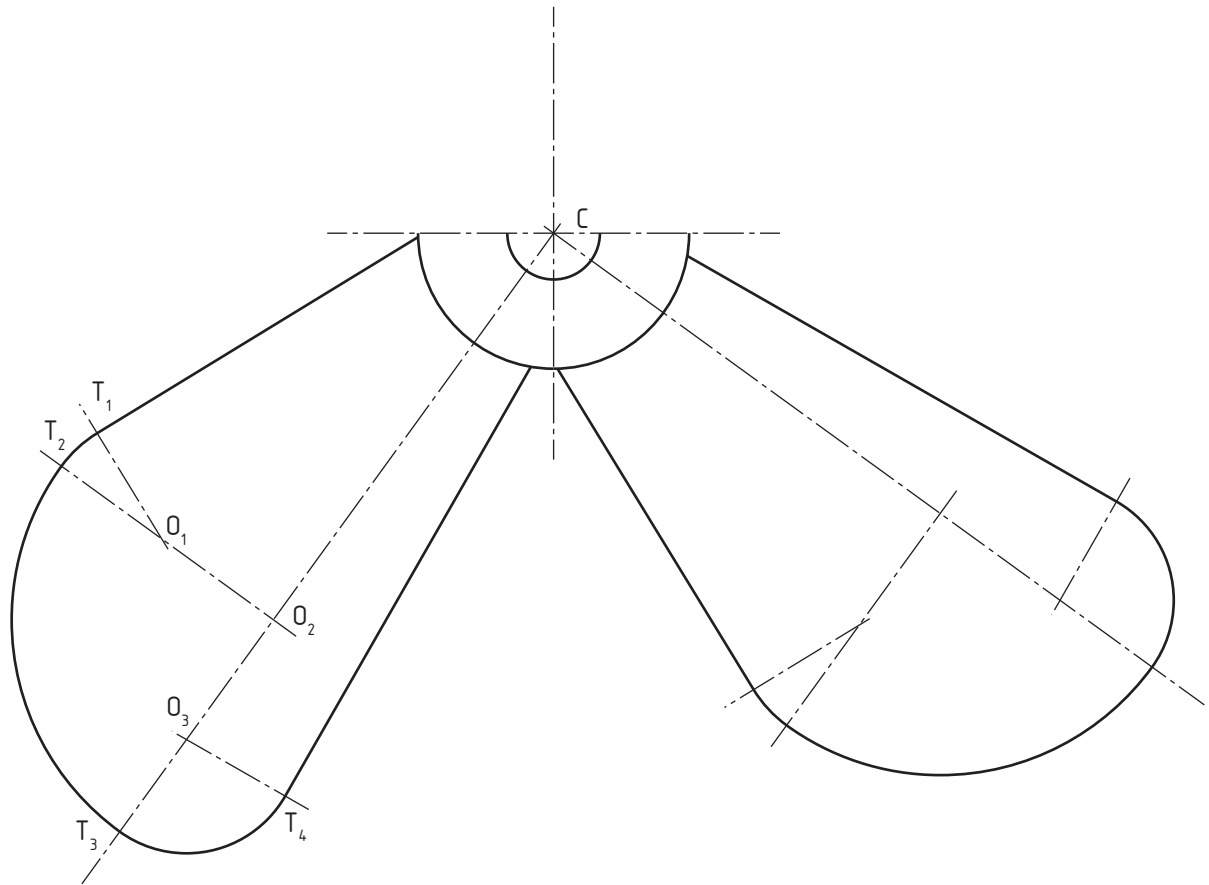
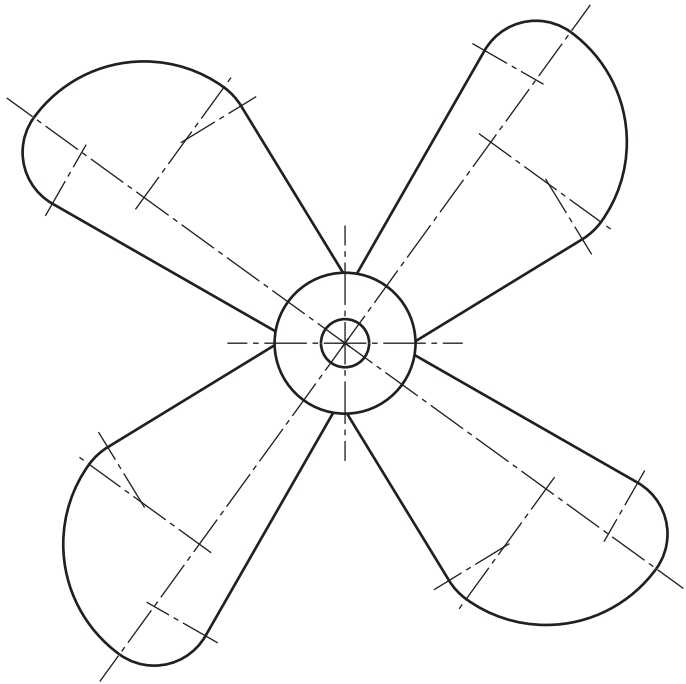
3.- With given similarity center **O**, draw similar figure with **ratio 2**.



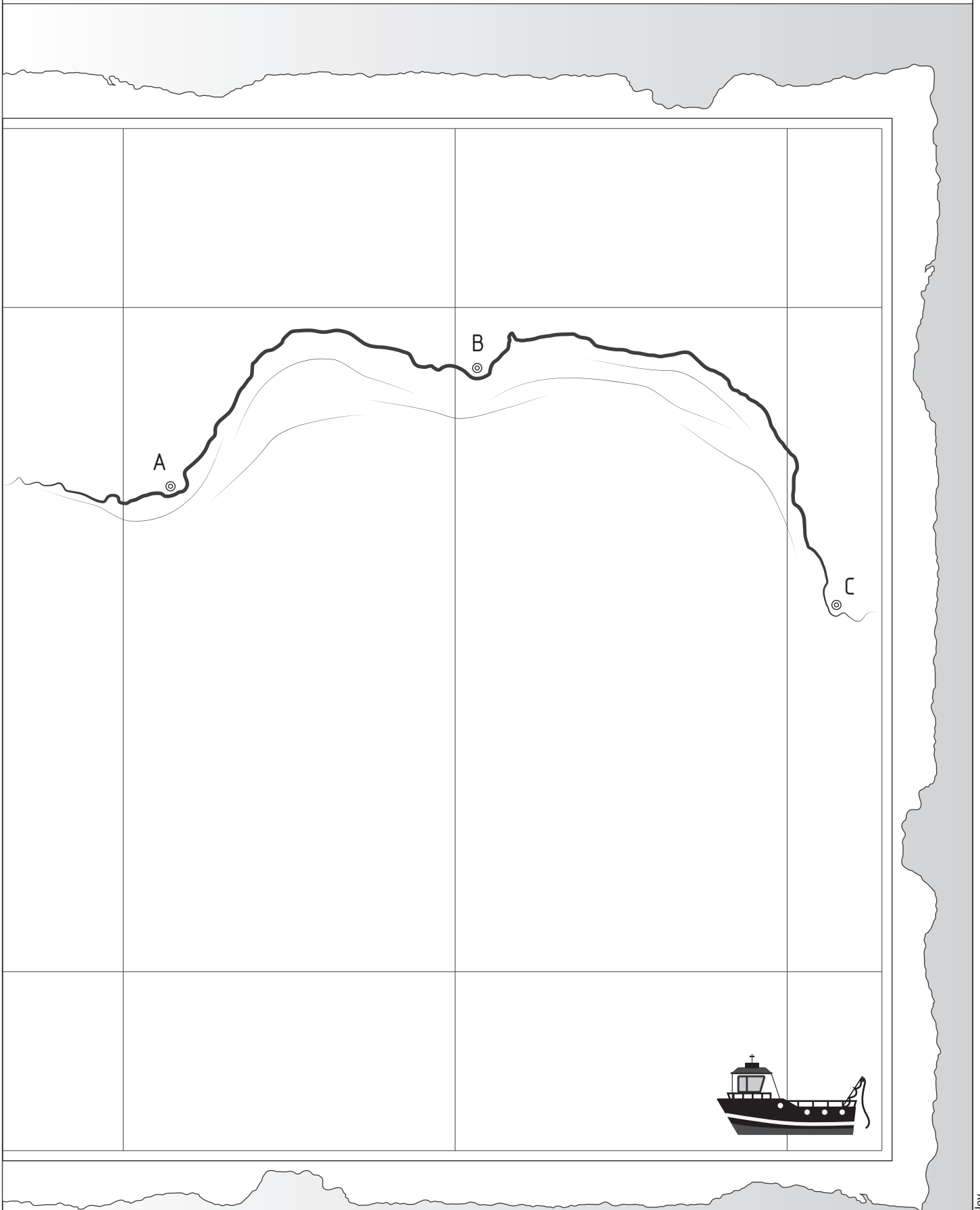
4.- Given **ABC** triangle, draw an inscribed square with a side on **AB** side, a vertex on **BC** and another vertex on **AC** side.



1.- Finish the drawing of the **fan** applying **symmetry** concepts.

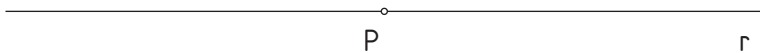


1.- A boat is adrift in the sea, to get help the captain needs to set his precise location in the navigation chart. He verifies that from his position he can see A and B lighthouses under an angle of  $30^\circ$ , and B and C lighthouses under an angle of  $45^\circ$ . Determine where the boat is located.

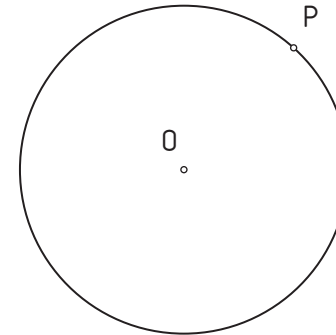




1.- Draw a circumference tangent to line **r** on dot **P** with a radius of **30 mm**.



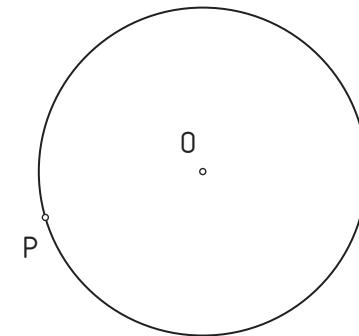
2.- Trace a tangent line to circumference **O** on **P** dot.



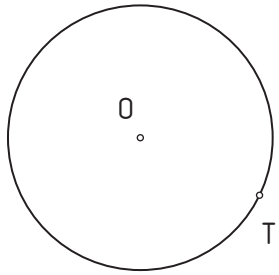
3.- Find the circumferences with radius **25 mm**. tangent to line **r** that go through **P** dot.



4.- Trace the circumference with radius **30 mm**. tangent to circumference **O** on **P** dot.



1.- Find the circumference tangent to given circumference **O** on **T** dot, that go through dot **P**.



P

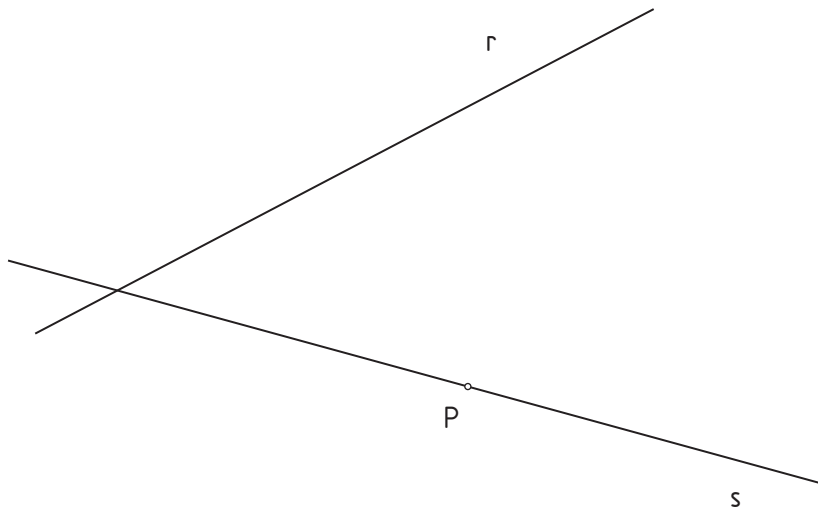
2.- Draw the circumference that passes through **A**, **B** and **C** dots.

A

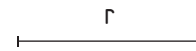
B

C

3.- Trace the tangent circumference to **r** and **s** lines. **P** is one of the tangency dots.



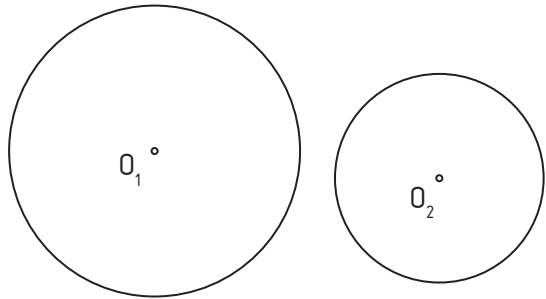
4.- Draw the circumference with **radius r**, tangent to given lines **s** and **t**.



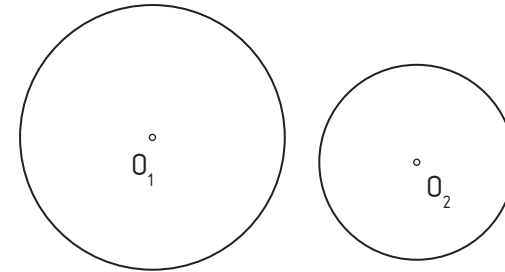
s

t

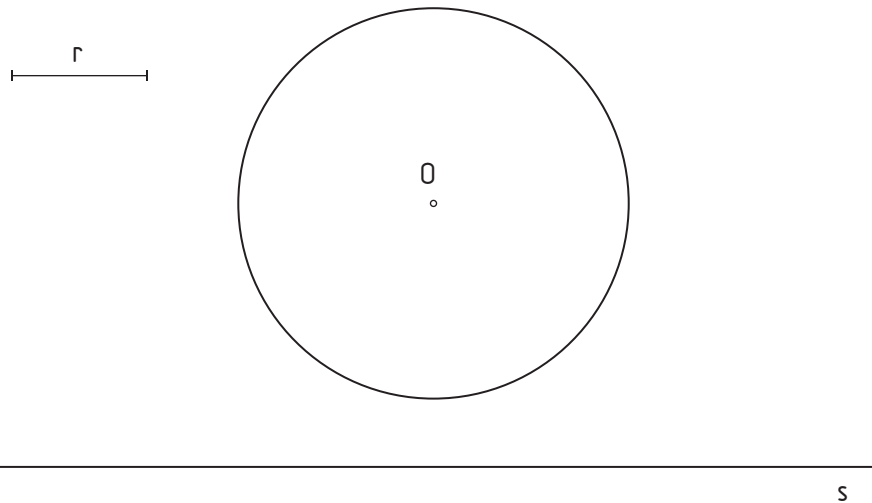
1.- Draw a circumference with radius **20 mm**, external tangent to given circumferences.



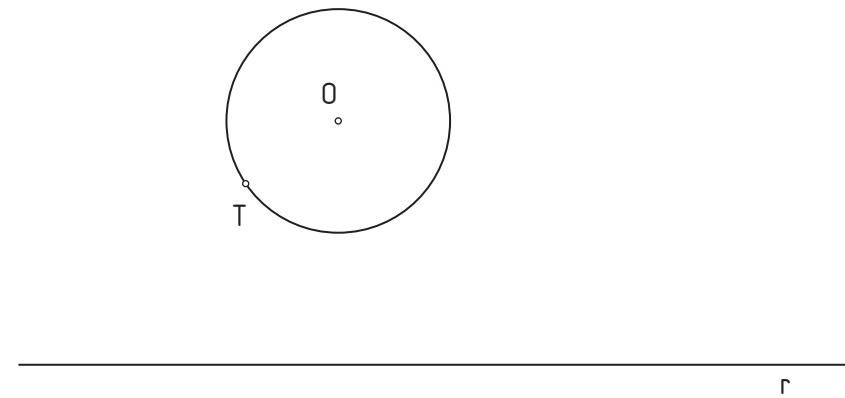
2.- Given circumferences are internally tangent to another with radius **50 mm**, find this circumference.



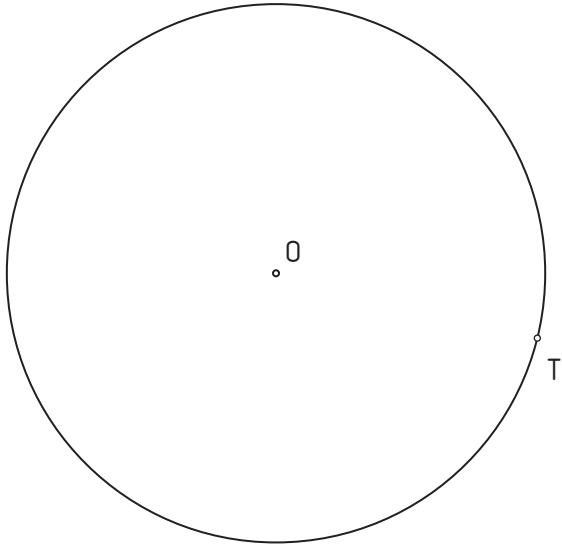
3.- Trace the circumferences with radius **r**, tangent to line **s** and circumference **O**.



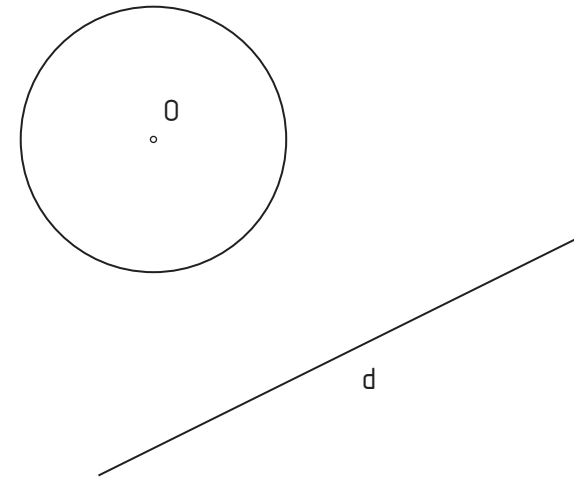
4.- Find the tangent circumferences to line **r** and circumference **O** on **T** dot.



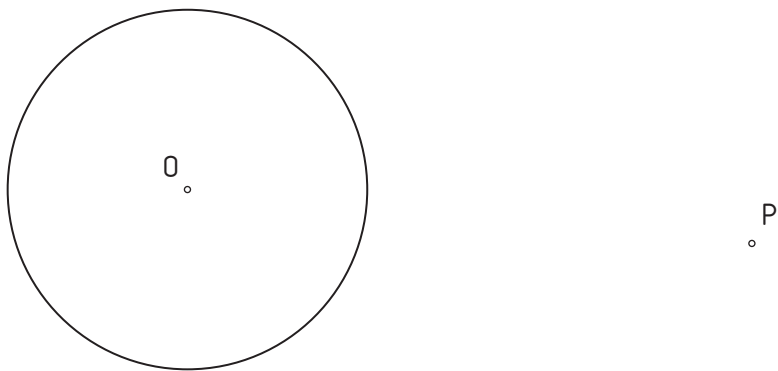
1.- Trace two circumferences with **radius 15 mm**, tangent to given one on **T**.



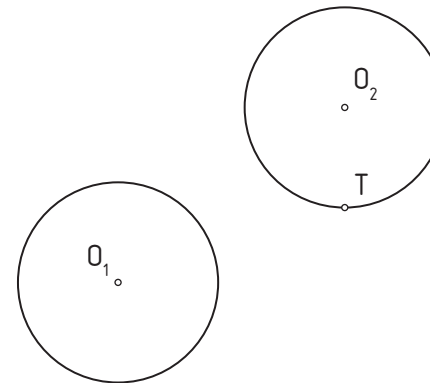
2.- Draw two tangent lines to given circumference, parallel to direction **d**.



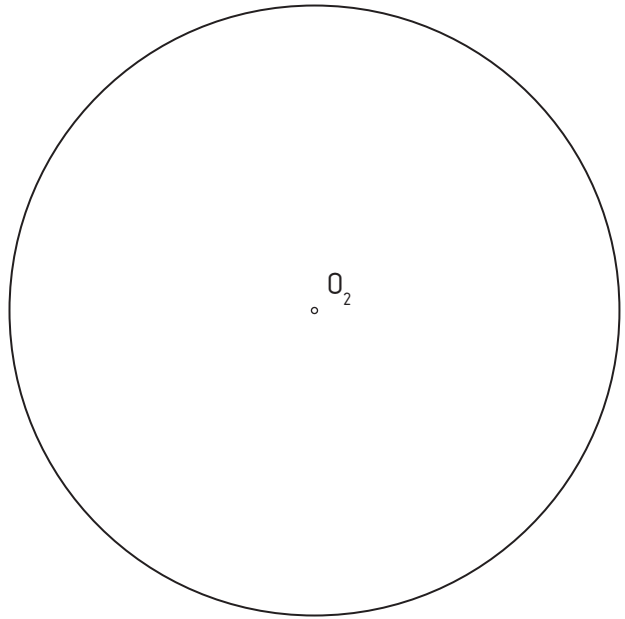
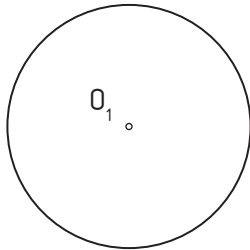
3.- Trace two tangent lines to circumference **O** from outer point **P**.



4.- Draw two tangent, concentric circumferences to given ones **O** and **O<sub>1</sub>** (they have the same radius). **T** is one of the tangent dots.



1.- Draw the outer tangent lines to the given circumferences.



2.- Draw the inner tangent lines to the given circumferences.

