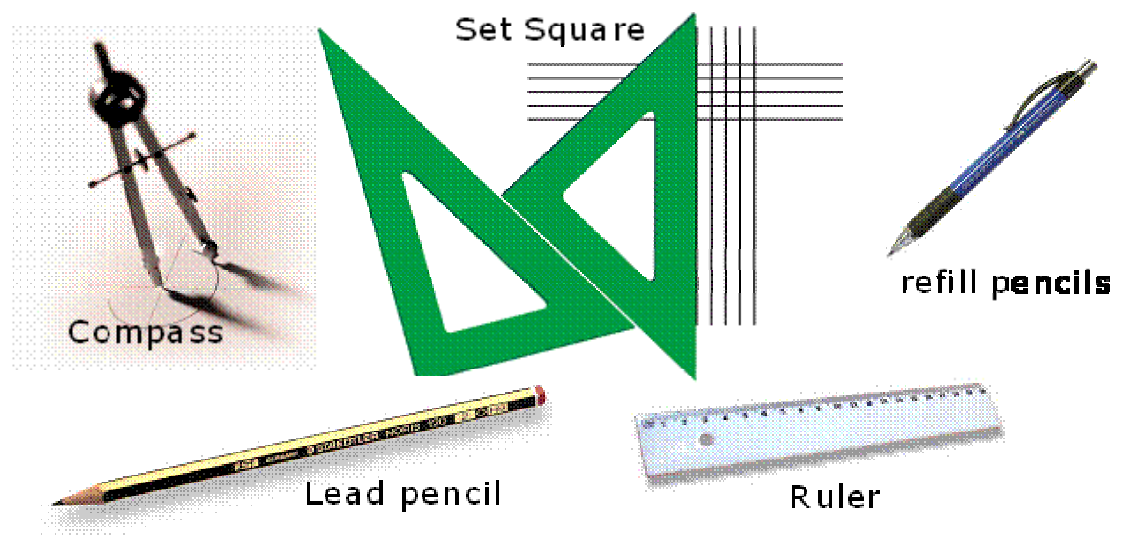


UNIT NUMBER	9
NAME	GEOMETRIC CONSTRUCTIONS

**SUMMARY**

**Drawing Instruments**

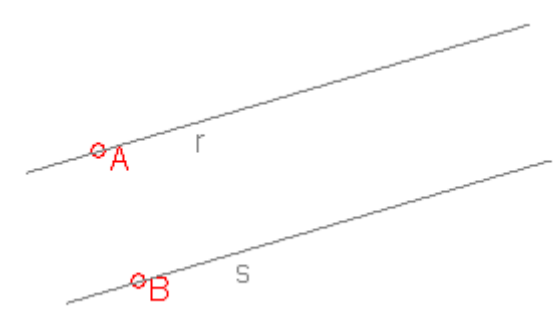
Compass: used to draw circumferences, arcs and to take or move measurements  
Ruler: used to draw lines and take measurements  
T-Square or set square: used to trace parallel lines, perpendicular lines or lines that form different angles.  
Lead pencil and refill pencils: the instruments of drawing



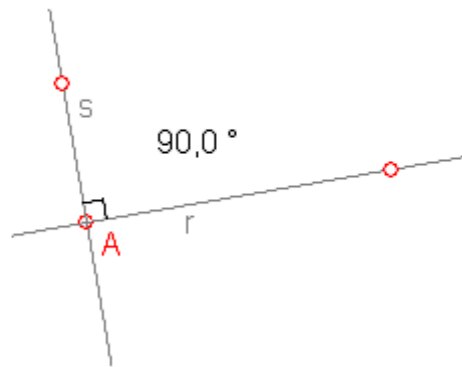
Geometric drawing is a form of objective representation for graphically defining shapes with precision and clarity.

**Basic Geometric lines**

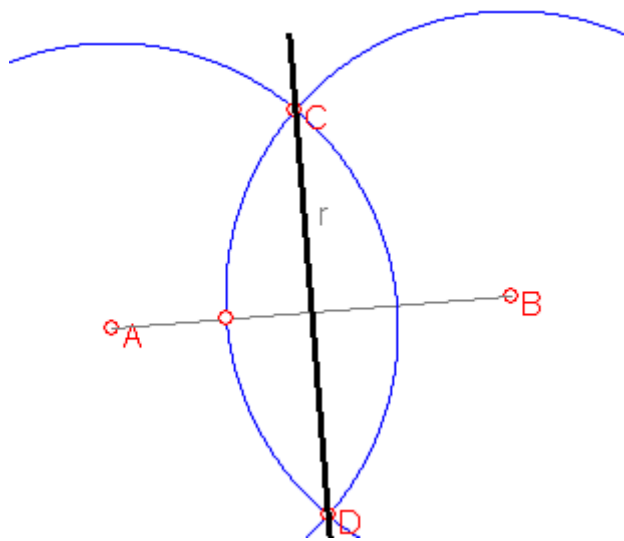
Parallel and Perpendicular:  
- Parallel lines: those that never cross



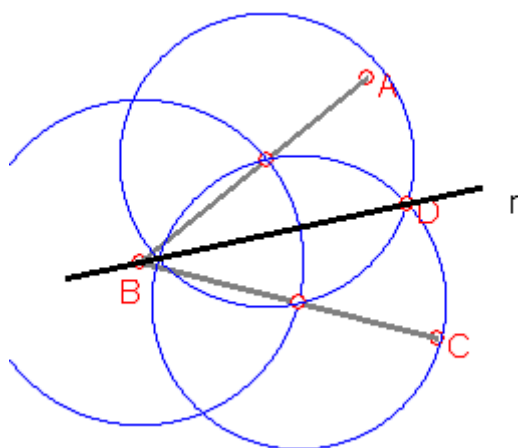
- Perpendicular lines: those that cross forming right angles



Perpendicular bisector: line perpendicular to a segment through it's middle point



Angular Bisector: line that divides an angle into two equal parts

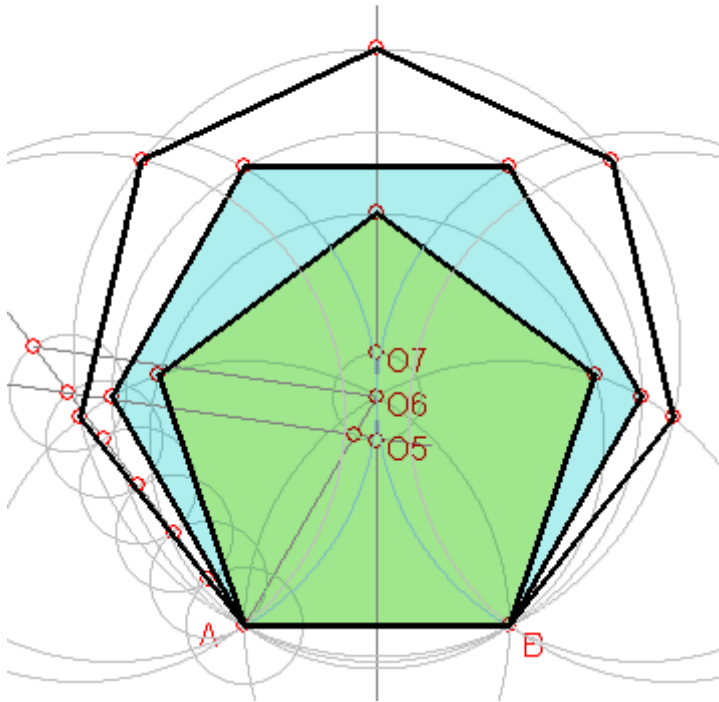


### **Regular polygons**

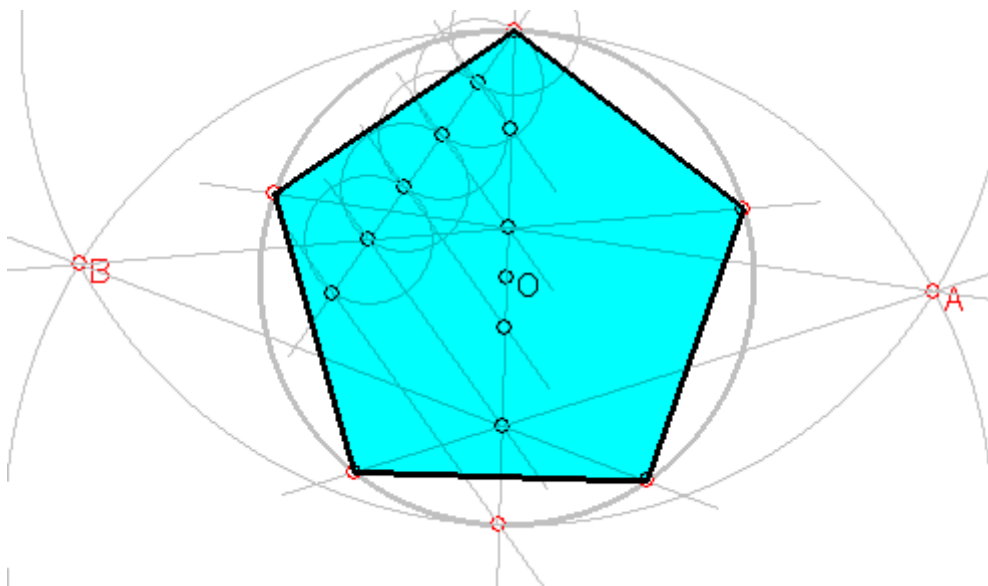
A regular polygon has all sides and angles equal

Constructuion of regular polygons:

- Know the side

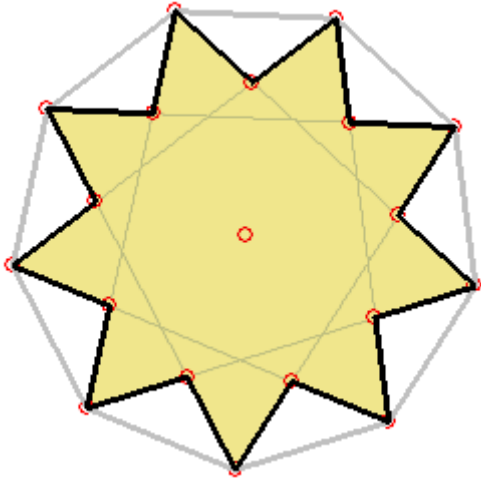


- Know the radius

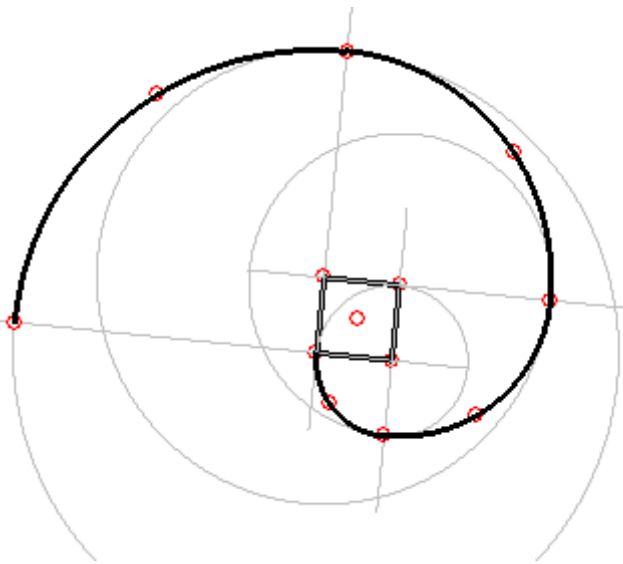


### **Starred polygons and spirals**

Starred polygons are formed drawing straight lines between the corners of a regular polygon in a different way.

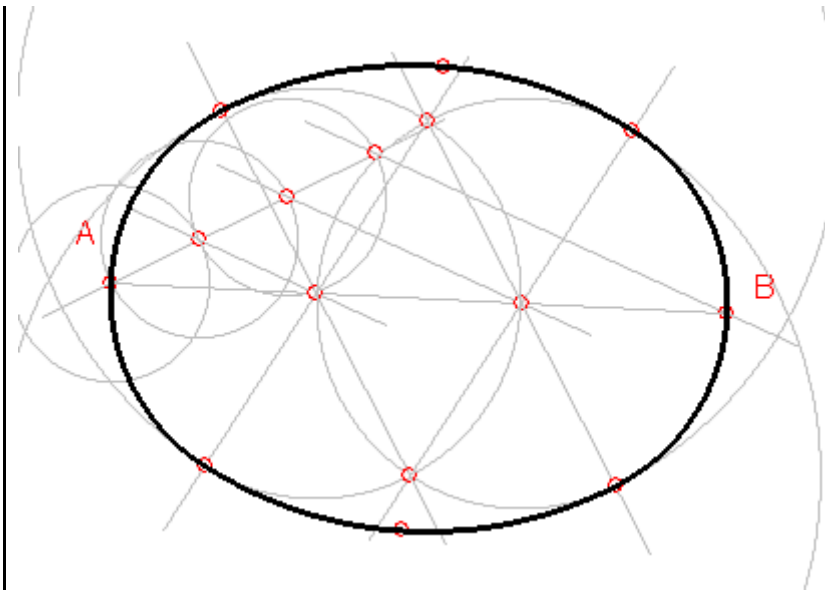


Spirals are curved lines that grow in an ordered way from a central nucleus

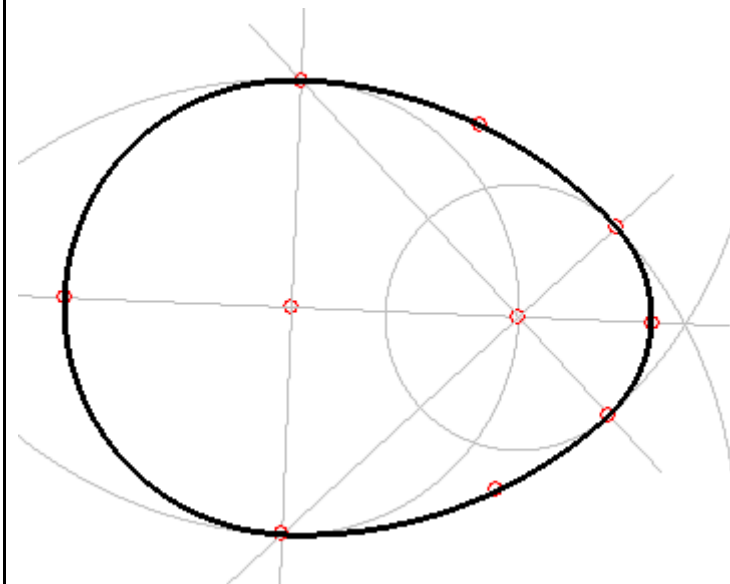


### **Ovals and Ovoids**

An oval is a closed curve formed by arcs of circumference with two axes of symmetry

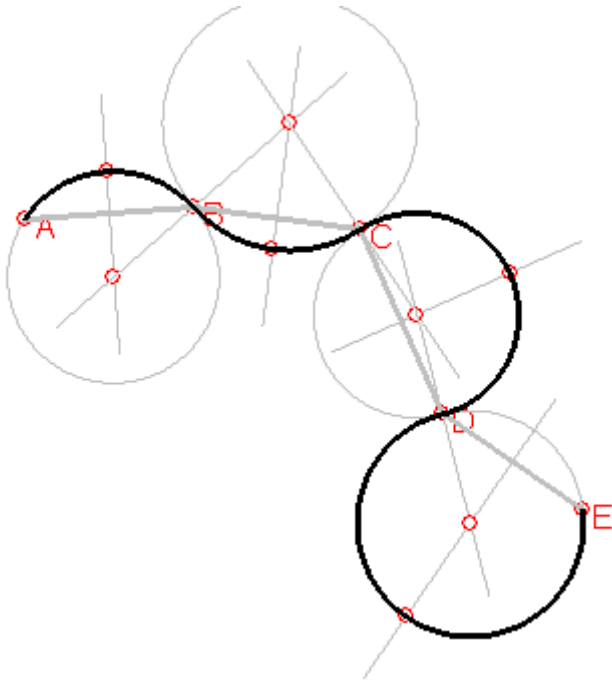


An ovoid is a closed curve formed by arcs of circumference with one axis of symmetry



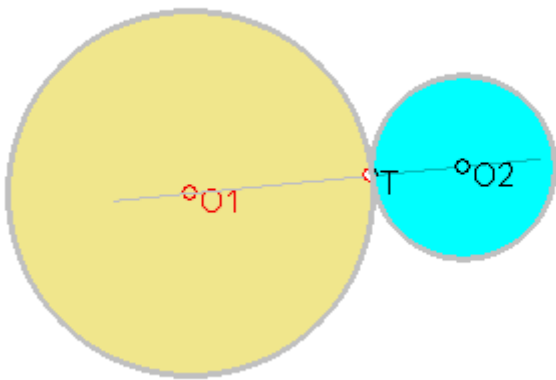
### Tangents

Are lines that join straight lines, curves lines or other kinds of lines in a way that appear continuous.

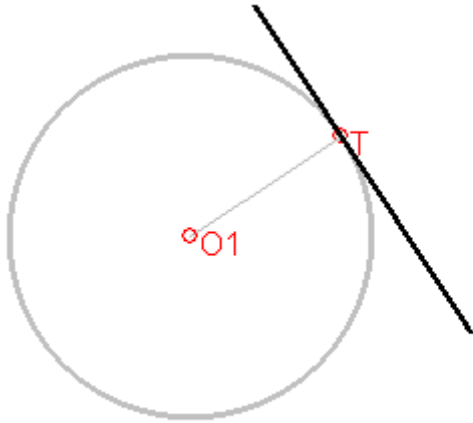


Tangents: Figures to keep in mind

The tangent point of two circumferences is situated on the line that joins the two centers.

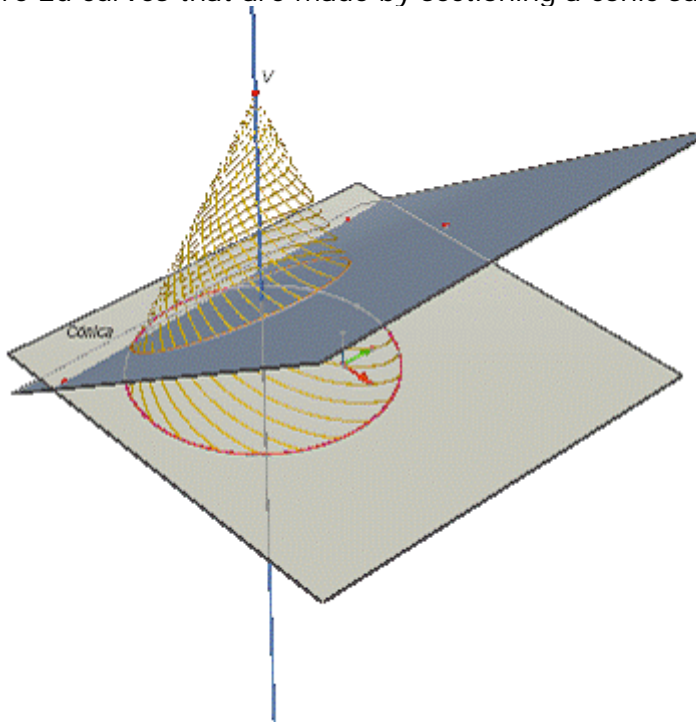


The tangent to a circumference is perpendicular to the radius that touches it's tangent point



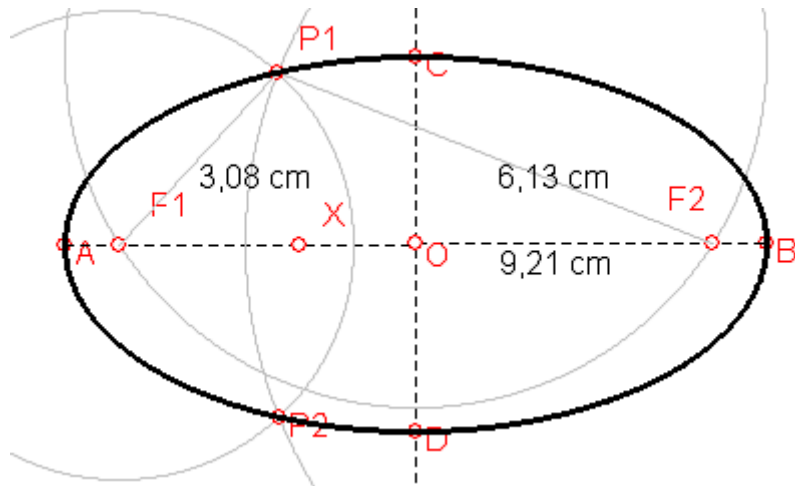
### Conic lines

are 2d curves that are made by sectioning a conic surface of revolution with a plane

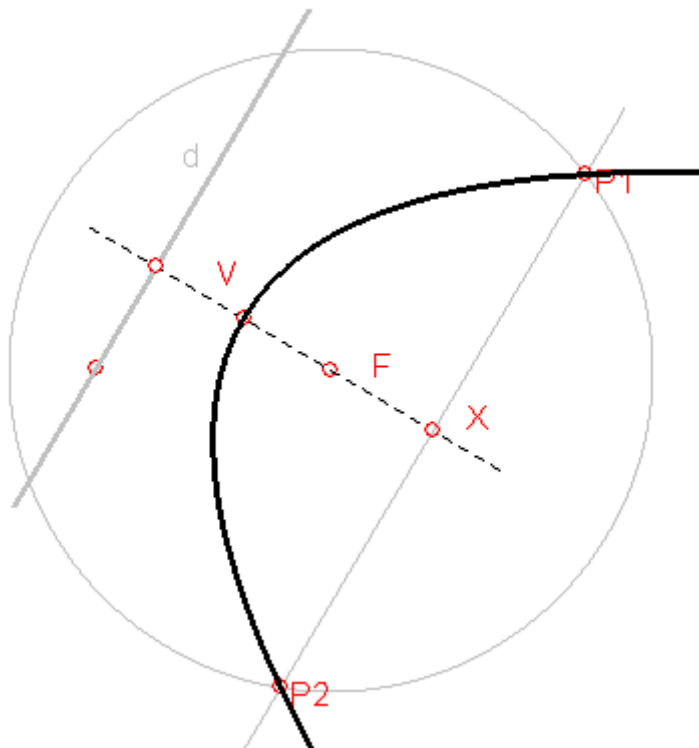


Types of Conic Curves:

ellipse: set of points which have a constant distance to two fixed points

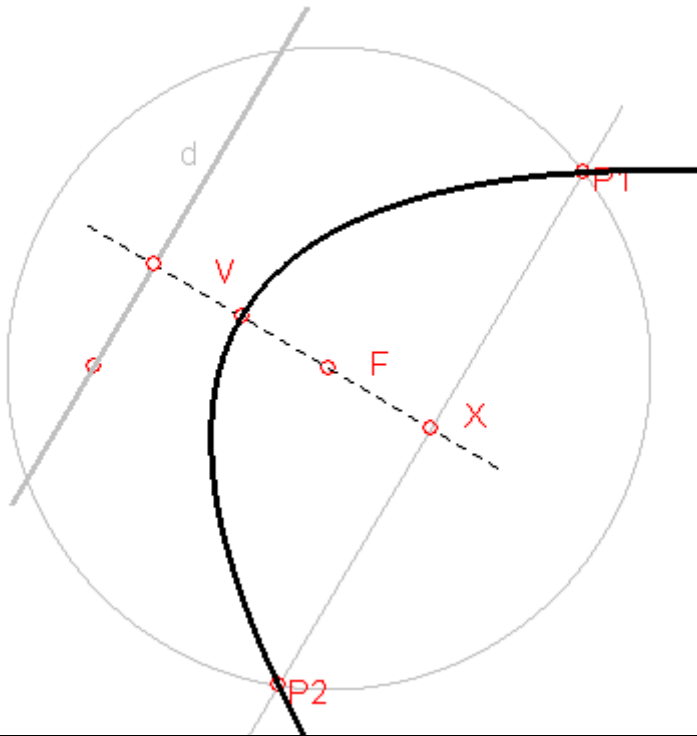


Parabola: set of points that are at the same distance from a line and to a fixed point



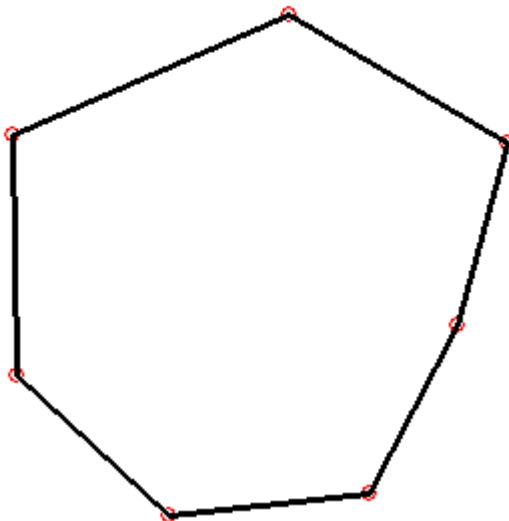
Hyperbola: set of points with constant different distances to two fixed points



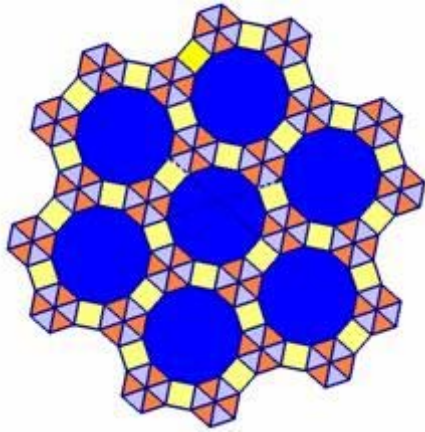


**SELF EVALUATION**

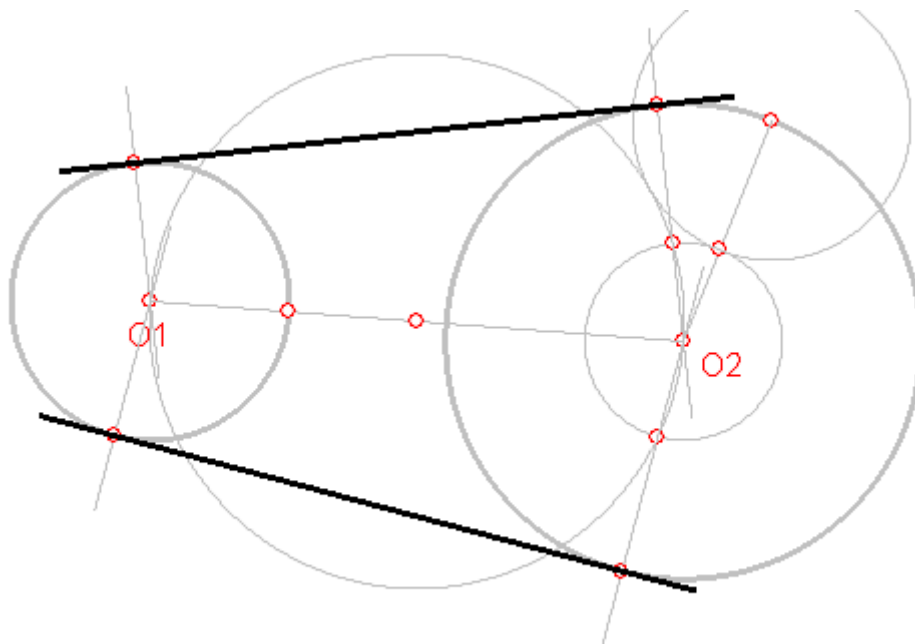
1. Number the steps needed to make a geometric line correctly.
2. What instruments are necessary to make all the basic geometric lines?
3. Define the concepts of perpendicular bisector and angular bisector.
4. What is a regular polygon? What two types of construction do you know for its drawing?
5. Is this a regular polygon? Why?



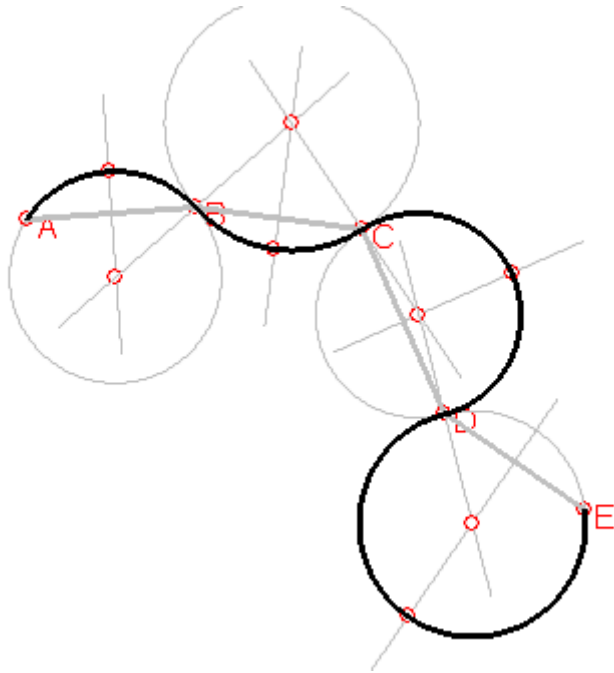
6. Observe this illustration and describe, apart from the main shape, the regular polygons that you find.



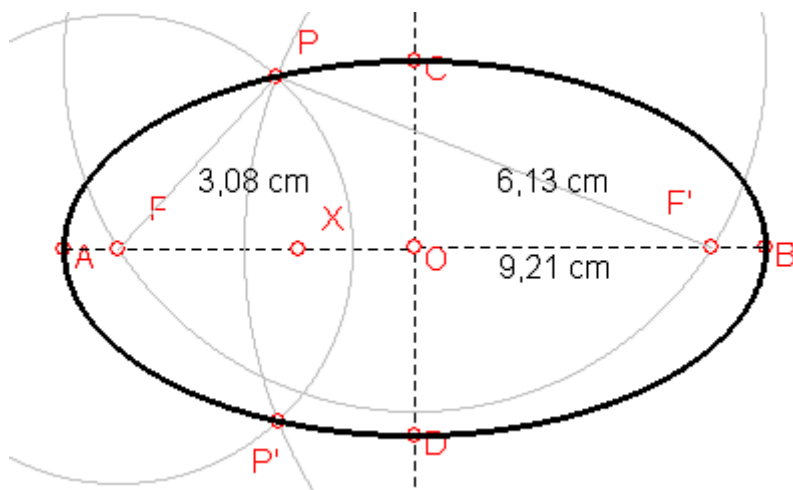
7. Is this drawing of common exterior tangents correct? Why?



8. What is this type of drawing called?



9. What value do we get if we add the distances  $PF$  and  $P'F'$ ? And if we add  $P'F$  and  $P'F'$ ?



10. Observe this picture. Can you make a brief description of it?



11. What geometric shapes studied in this unit appear in the works of Jasper Johns?



**FINAL ACTIVITIES**