

Chapter - 5.

Introduction to Euclid's Geometry:-

- Introduction.
- Euclid's Definitions, axioms and Postulates
- Equivalent versions of Euclid's fifth postulate.

Introduction:-



➤ Euclid, also known as the Euclid of Alexandria, was a Greek mathematician, often referred to as the “father of geometry.” He was active in Alexandria during the reign of Ptolemy I (323 - 283 BC). His *Elements* is one of the most influential works in the history of mathematics, serving as the main textbook for teaching (especially geometry) from the time of its publication until the late 19th or early 20th century. In the *Elements*, Euclid deduced the principles of what is now called Euclidean geometry from a small set of axioms. Euclid also wrote works on perspective, conic sections, spherical geometry, number theory and rigor.

Euclid's Definitions, axioms and Postulates



- A LINE IS BREADTH LESS LENGTH.
- A STRAIGHT LINE IS A LINE WHICH LIES EVENLY WITH THE POINTS ON ITSELF.
- A SURFACE IS THAT WHICH HAS LENGTH AND BREADTH ONLY.

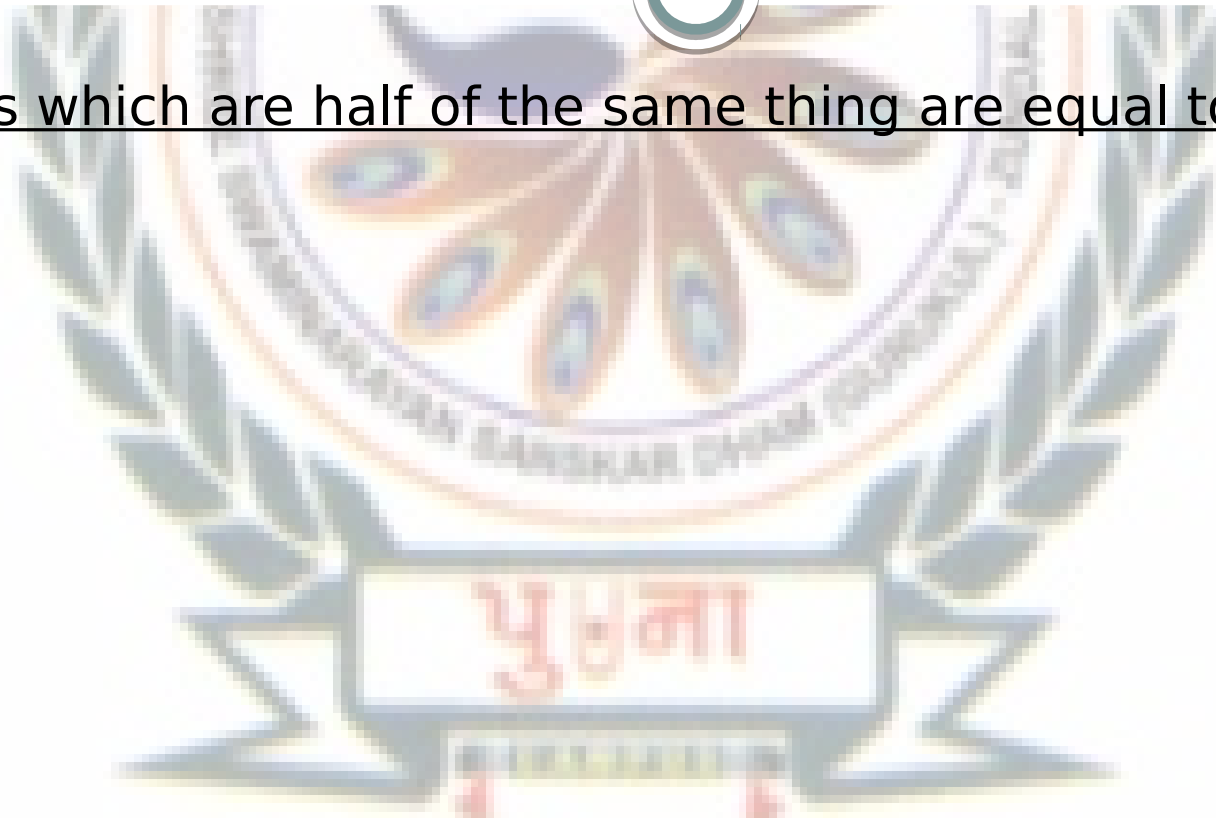
Euclid's Axioms.



- Things which are equal to the same thing are equal to the another.
- If equal are added to equals, the wholes are equals.
- If equal are subtracted from equals, the reminders are equals.
- Things which coincide with one another are equal to one another.
- The whole is greater then the part.
- Things which are double of the same thing are equal to one another.



➤ Things which are half of the same thing are equal to one another.



Euclid's Postulate.



- A straight line may be drawn from any one point to any other point.
- A terminated line can be produced indefinitely.
- A circle can be drawn with any centre and any radius
- All right angles are equal to one another.
- If a straight line falling on two straight line makes the interior angles on the same side of it taken together less than two right angles, then the two straight lines, if produced indefinitely, meet on that side on which the sum of angles is less than two right angles.

Equivalent versions of Euclid's fifth postulate.



- For every line l and for every point P not lying on l , there exists a unique line m passing through P and parallel to l .
- Two distinct intersecting lines cannot be parallel to the same line.