

Lecture 3

GEOMETRIC CONSTRUCTIONS



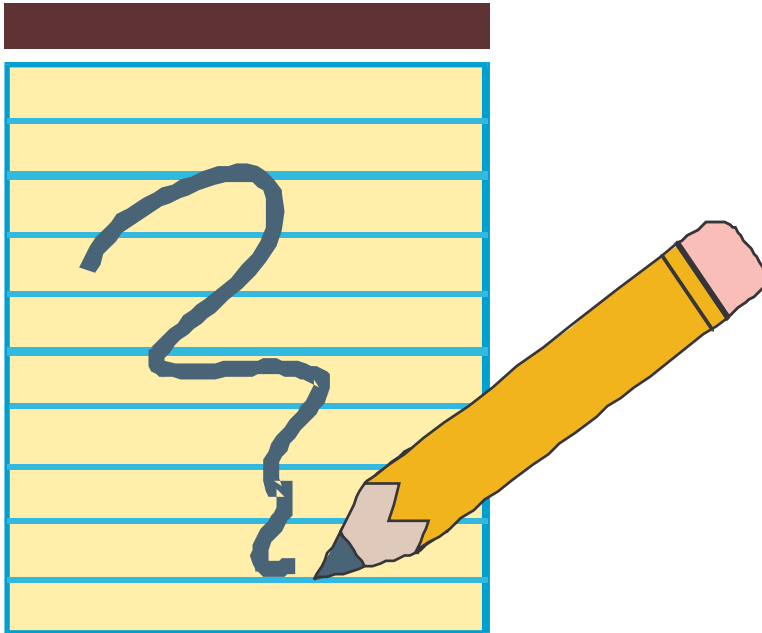
TA 101 : Engineering Graphics

2007~08 Semester II

January – May 2008

OUTLINE

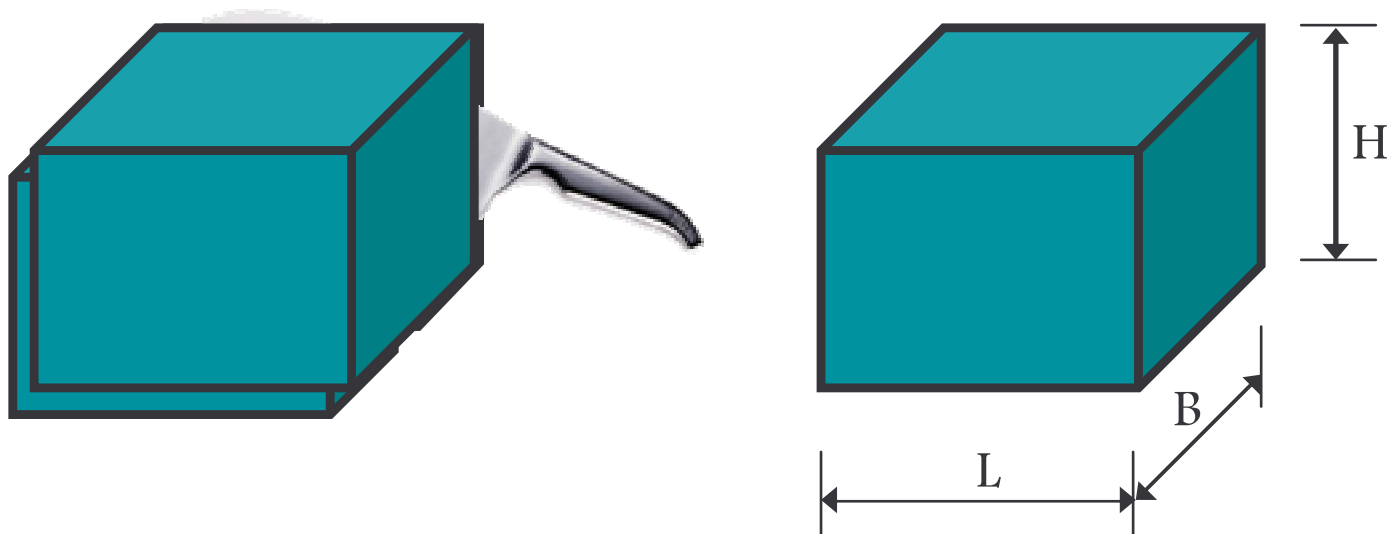
- Line work
- Scales
- Some basic constructions



LINE WORK

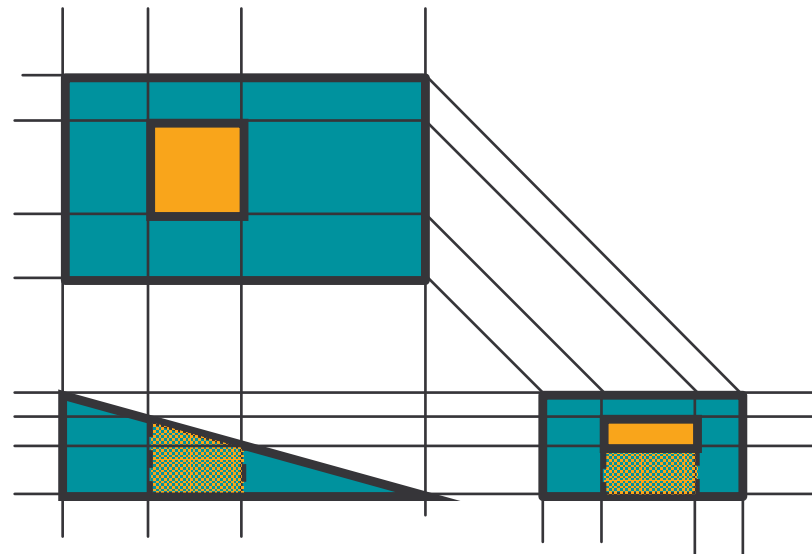
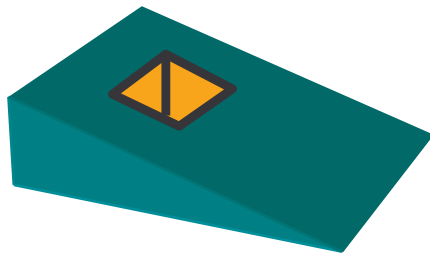
LINE STYLES

- Lines required in drawing
 - Object defining lines
 - Construction lines
 - Cutting lines & centerlines



LINE STYLES

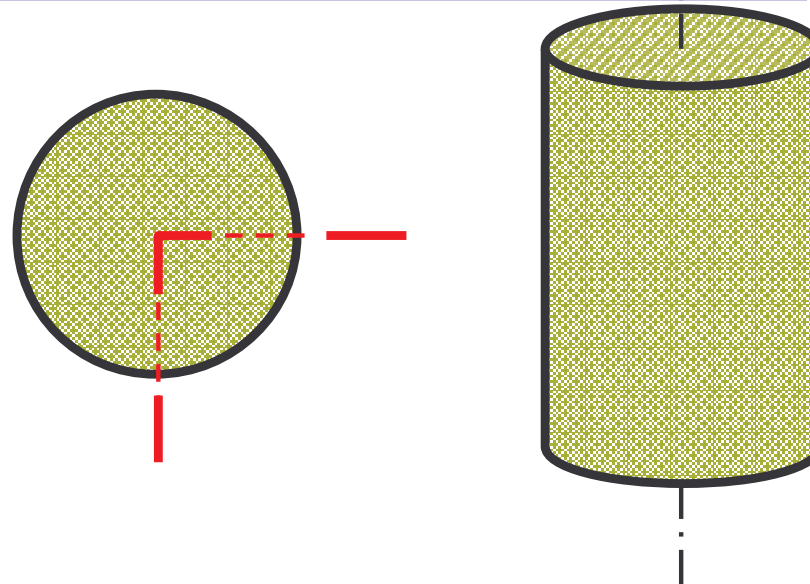
- Lines required in drawing
 - Object defining lines
 - Construction lines
 - Cutting lines & centerlines



LINE STYLES

- Lines required in drawing

- Object defining lines
- Construction lines
- Cutting lines & centerlines





SCALES

SCALES

- Drawing size with respect to
 - Actual size of object

ENLARGED

Drawing
Size

REDUCED



- Written as a ratio

$$1 : A$$

(*Drawing : Actual*)

– Full Scales

- 1:1

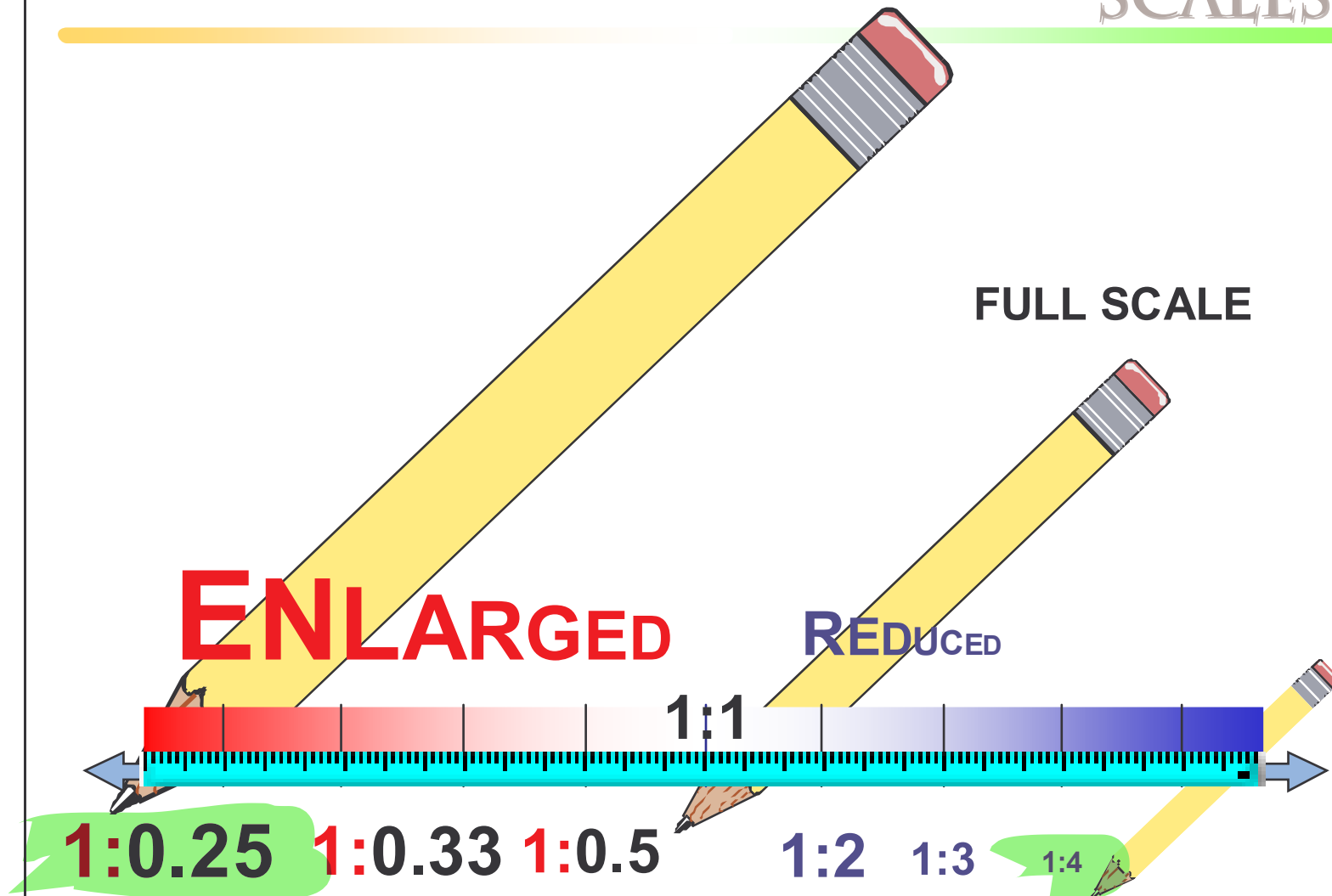
– Reduced Scales

- 1:A $A > 1.0$

– Enlarged Scales

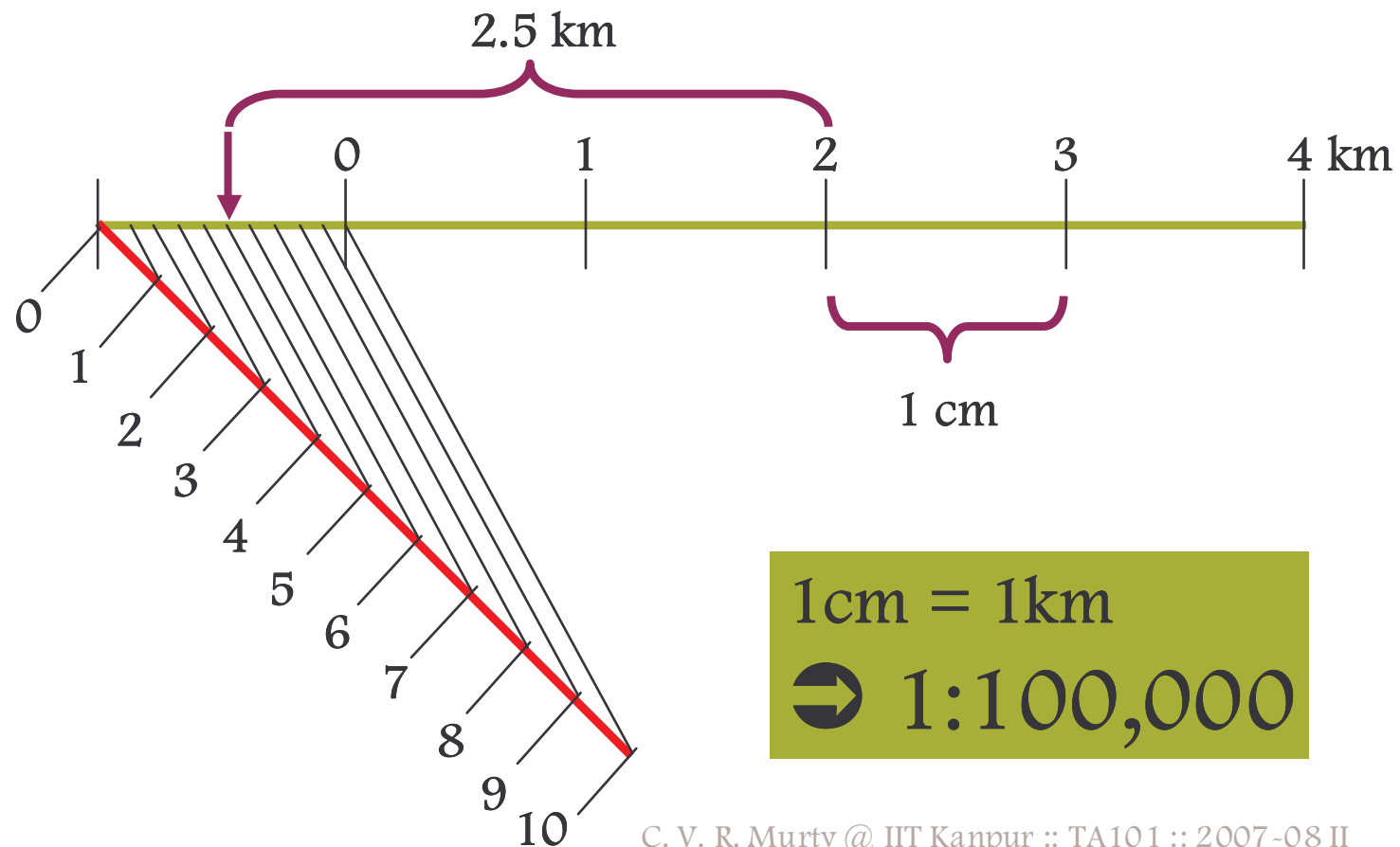
- 1:A $A < 1.0$

SCALES



SCALES

- A scale to make reduced scale drawings



- Full Scales

- Hand-held objects

- Keys

- Reduced Scales

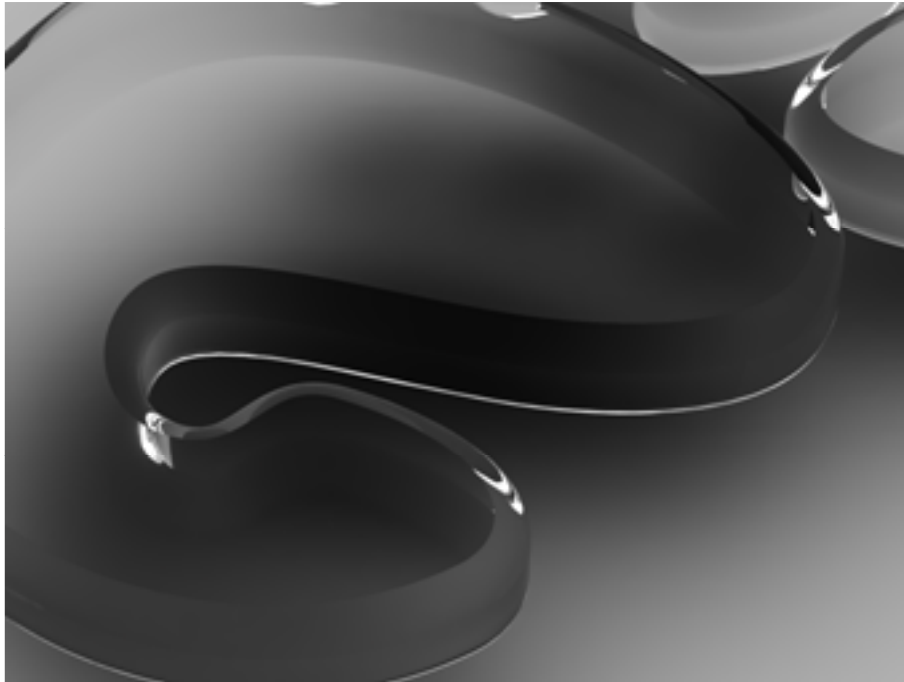
- Large objects

- Houses, Cities, Countries

- Enlarged Scales

- Miniature objects

- VLSI Chips



GEOMETRIC CONSTRUCTIONS

DEFINITIONS OF GEOMETRIES

- Types

- Lines

- Planes

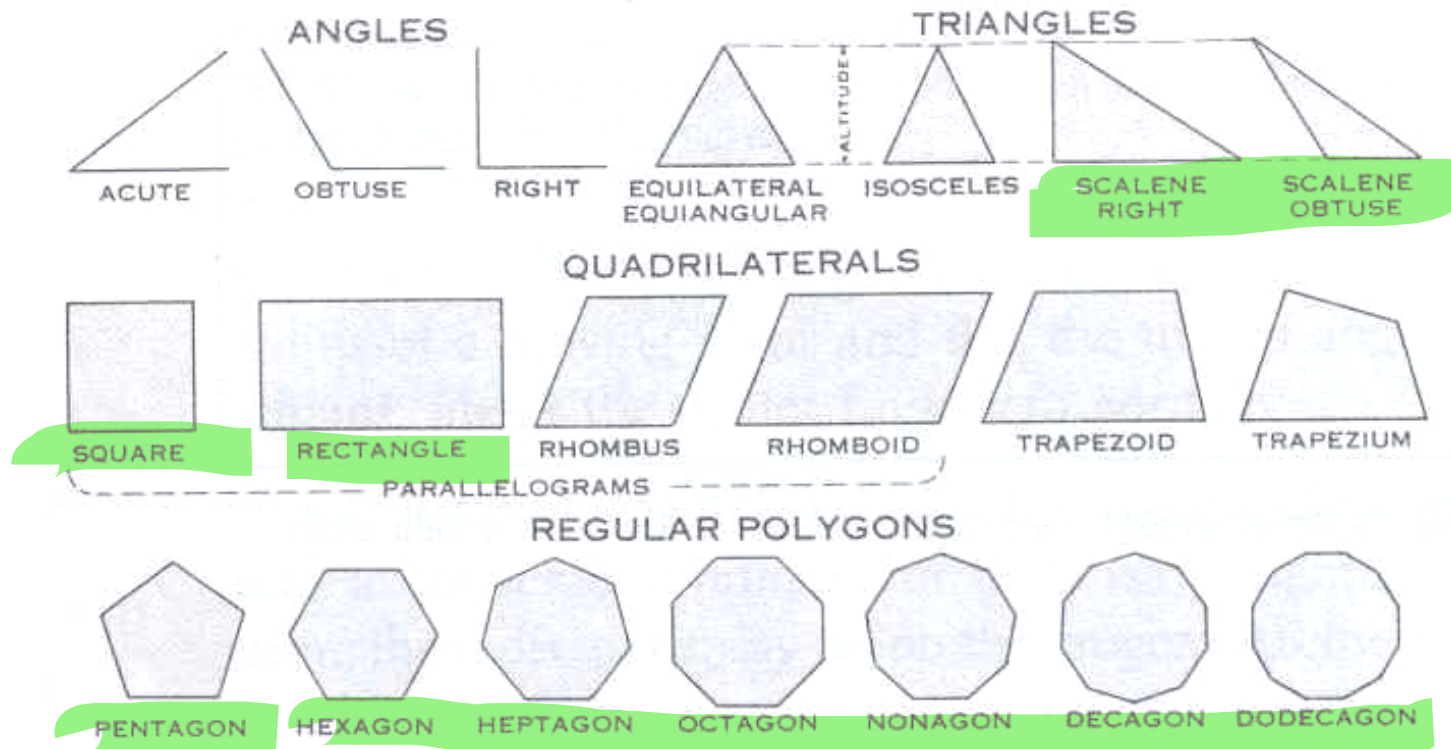
- Solids

- Doubly~curved surfaces and objects

- Warped surfaces

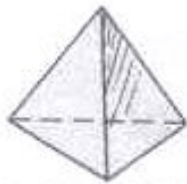
DEFINITIONS...

- Lines & Planes

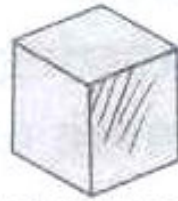


DEFINITIONS...

- Five Regular Solids



TETRAHEDRON



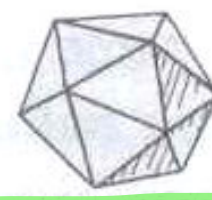
HEXAHEDRON



OCTAHEDRON



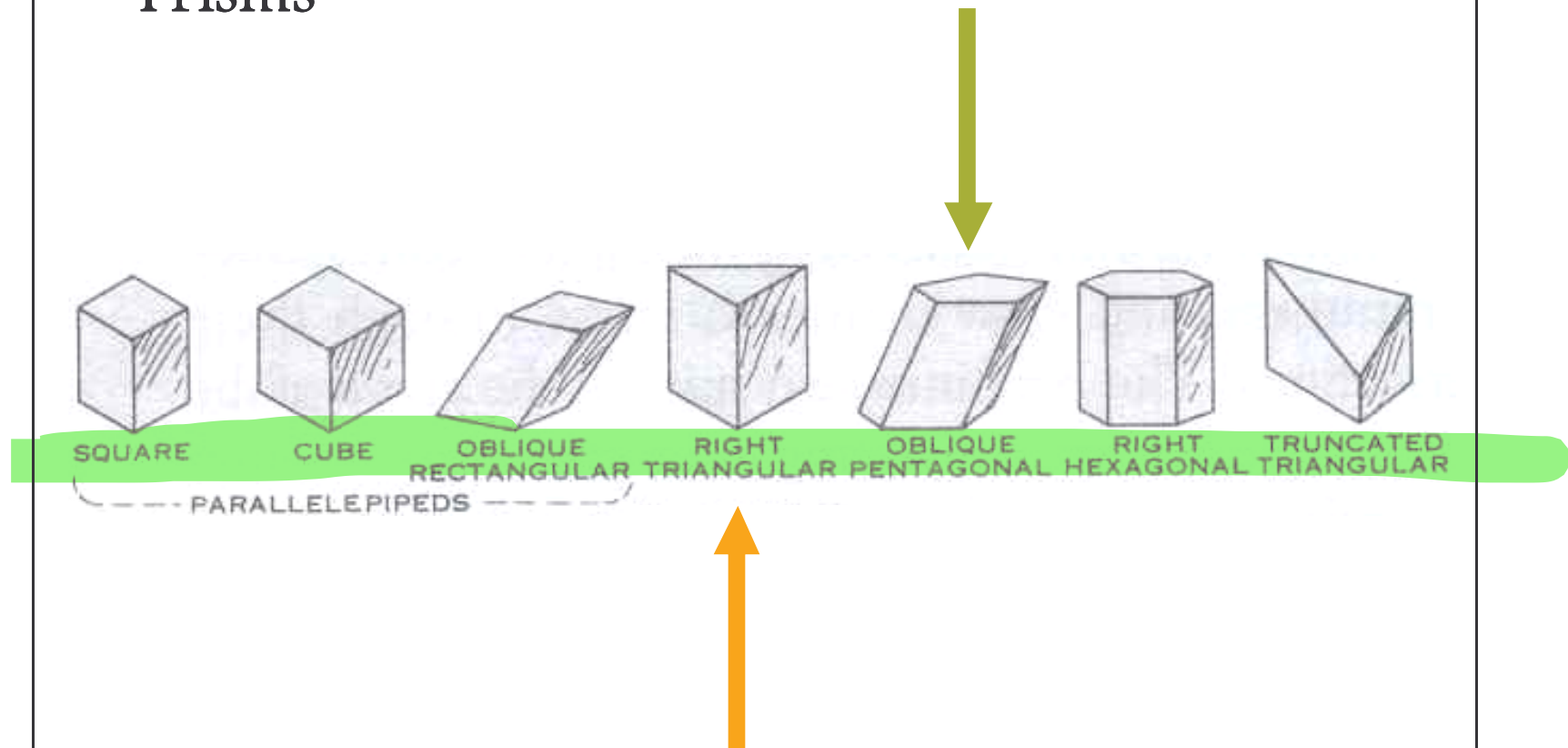
DODECAHEDRON



ICOSAHEDRON

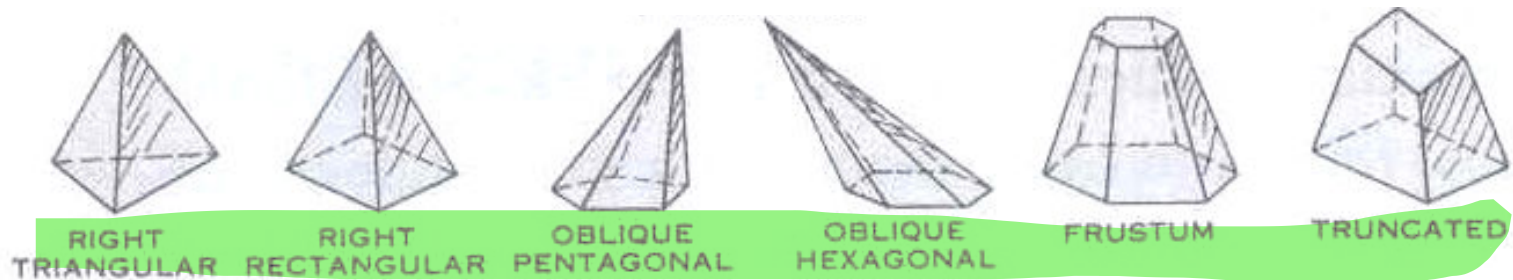
DEFINITIONS...

- Prisms



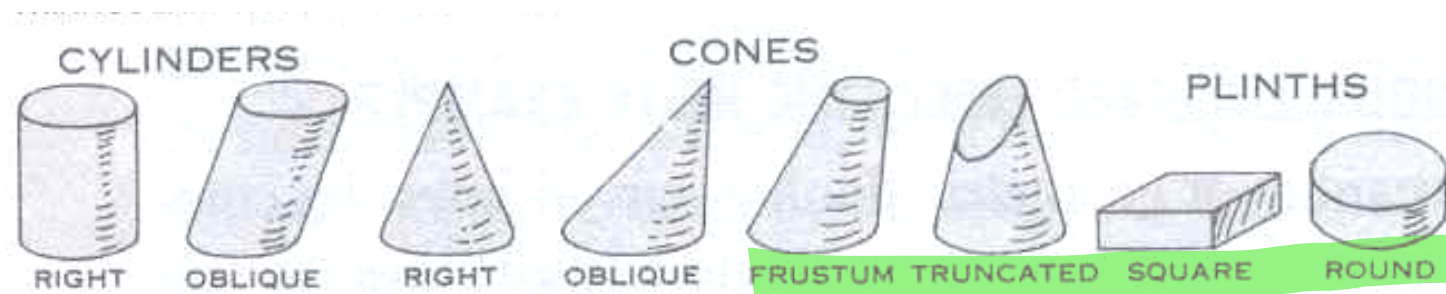
DEFINITIONS...

- Pyramids



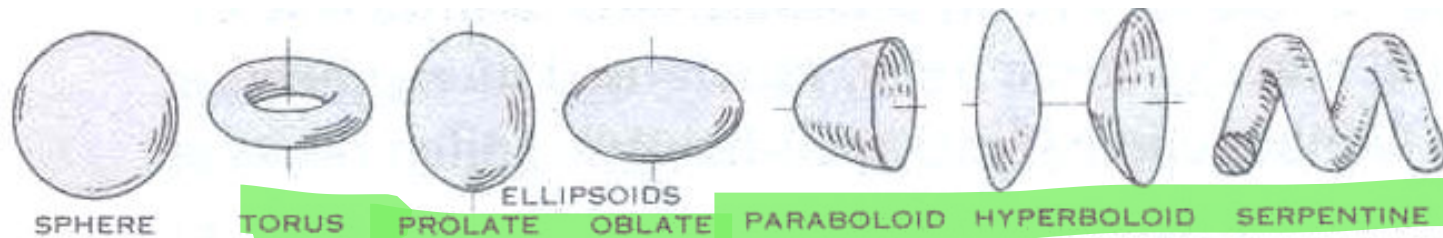
DEFINITIONS...

- Cylinders & Cones

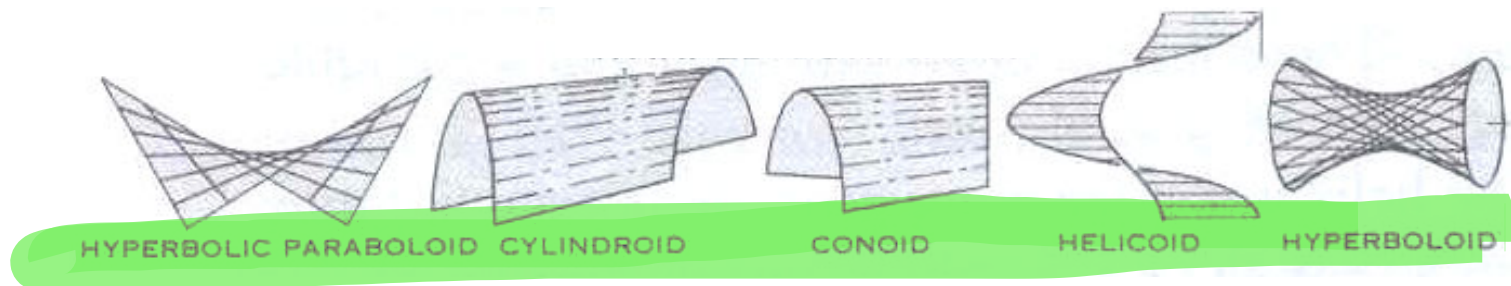


DEFINITIONS...

- Doubly~curved surfaces

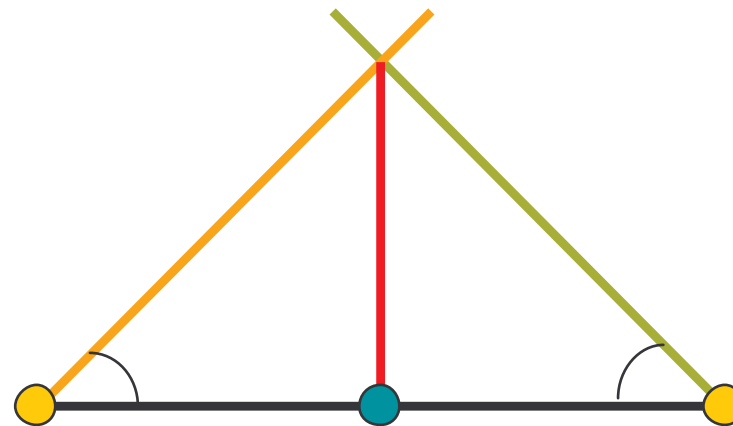


- Warped surfaces



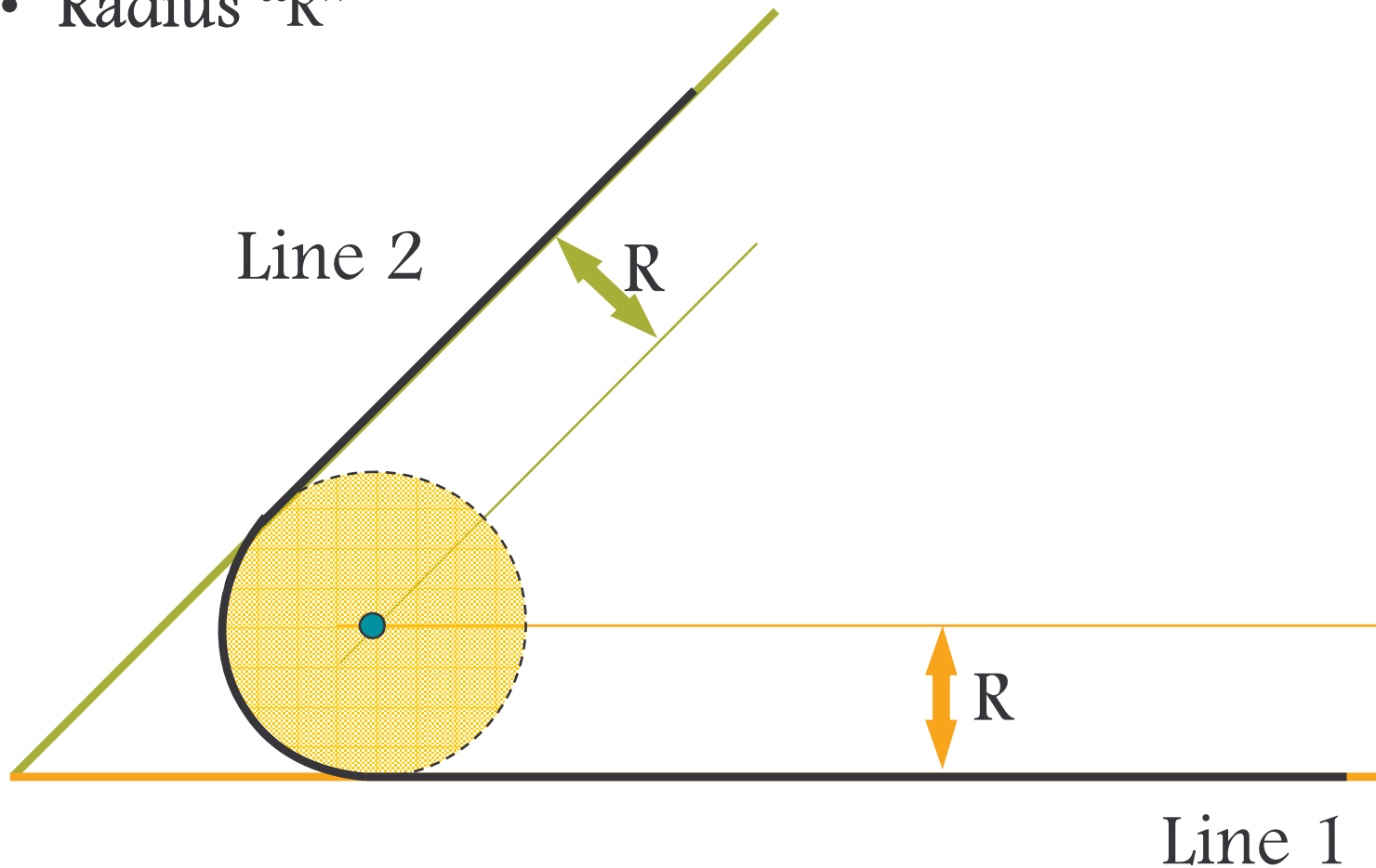
- Many basic constructions
 - Only some of them demonstrated in the class

BISECT A LINE



CURVE TANGENT TO 2 LINES

- Radius “R”



BASIC CONIC SHAPES

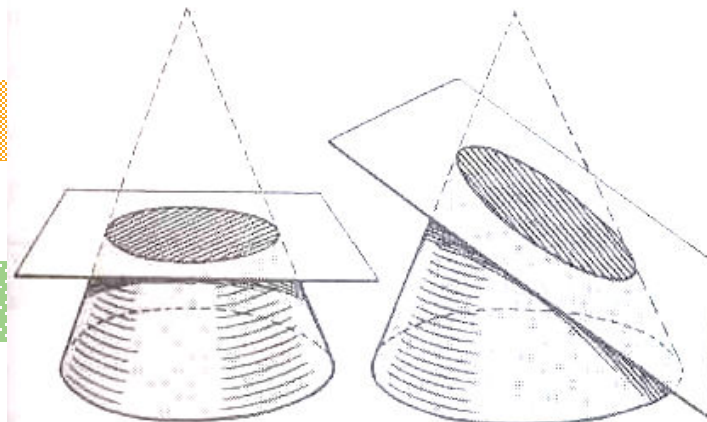
- All from a CONE

- Circle

- Ellipse

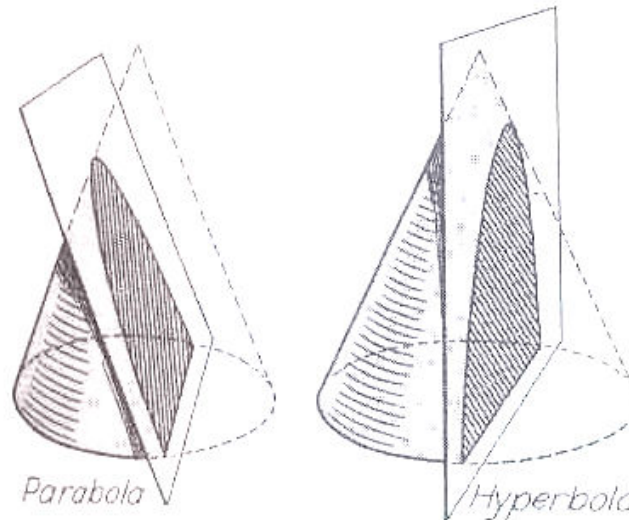
- Parabola

- Hyperbola



Circle

Ellipse

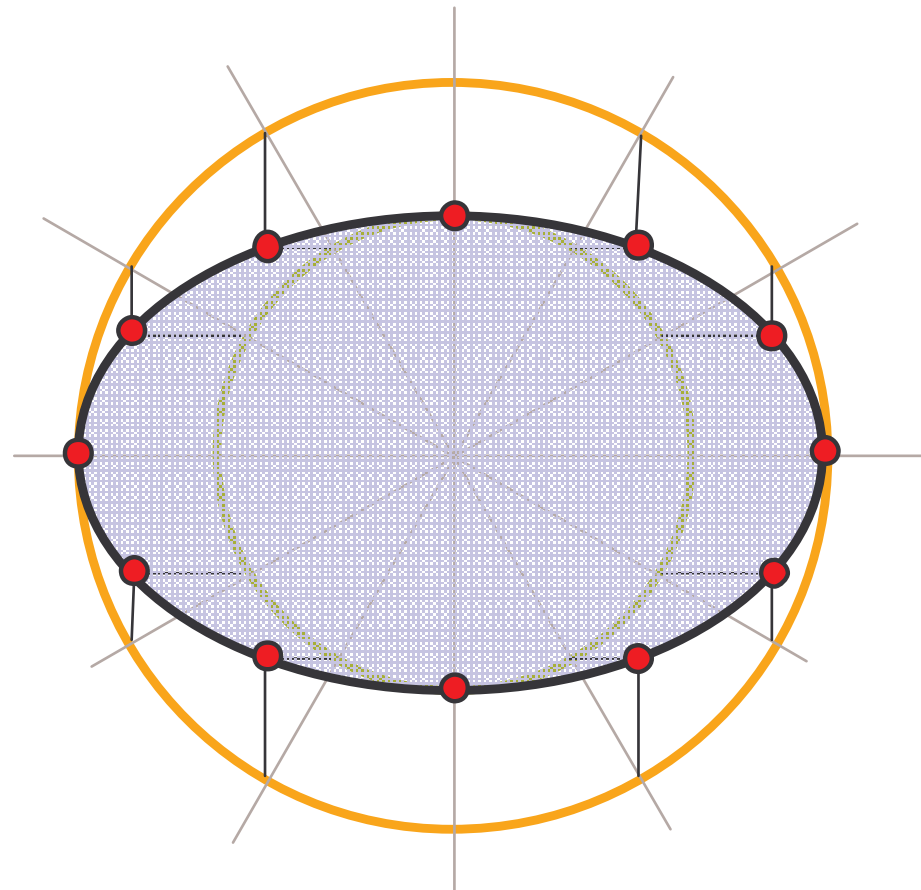
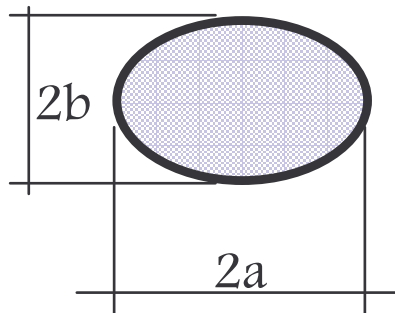


Parabola

Hyperbola

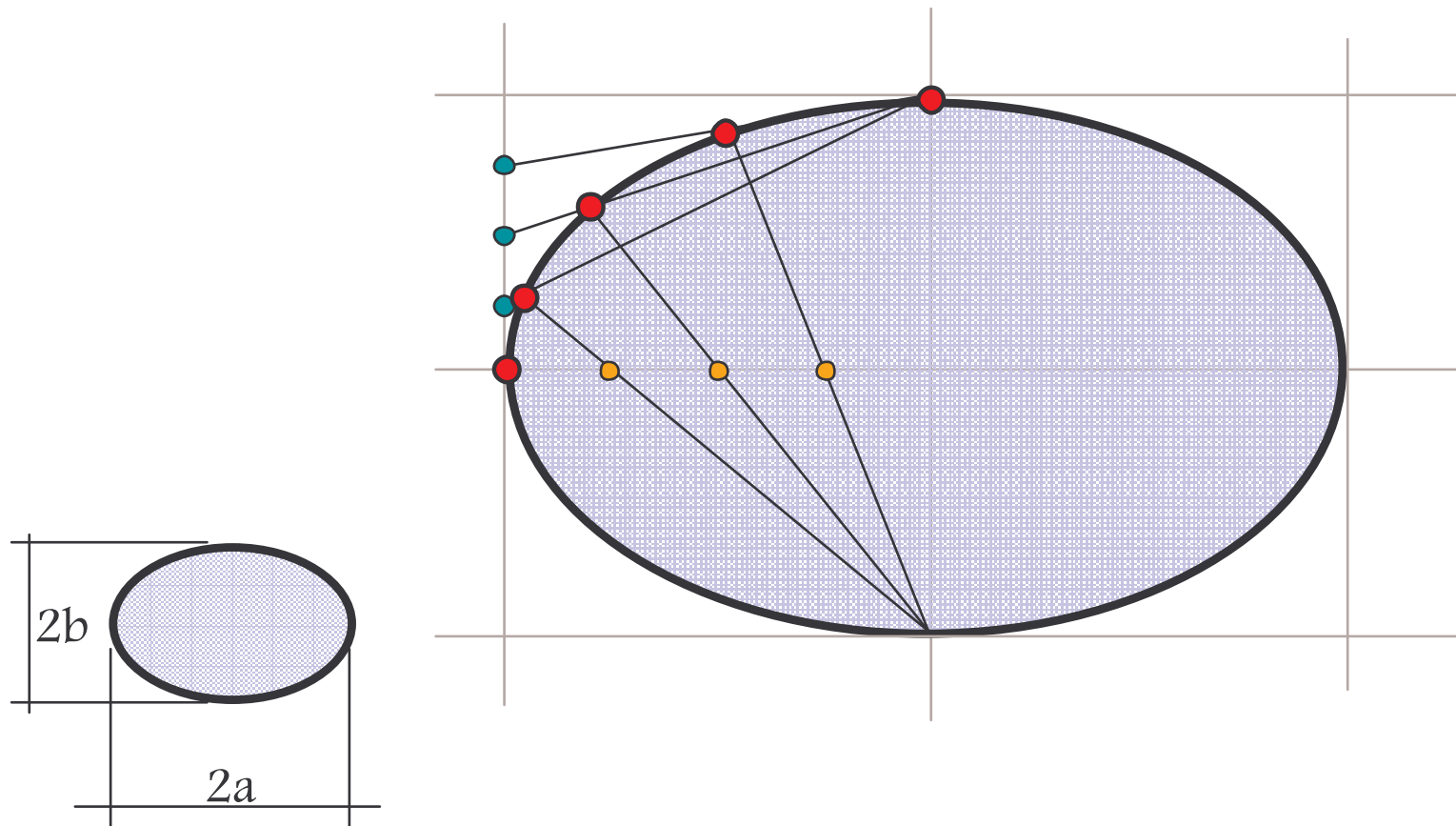
ELLIPSE

- Exact method 1
 - Major axis $2a$
 - Minor axis $2b$



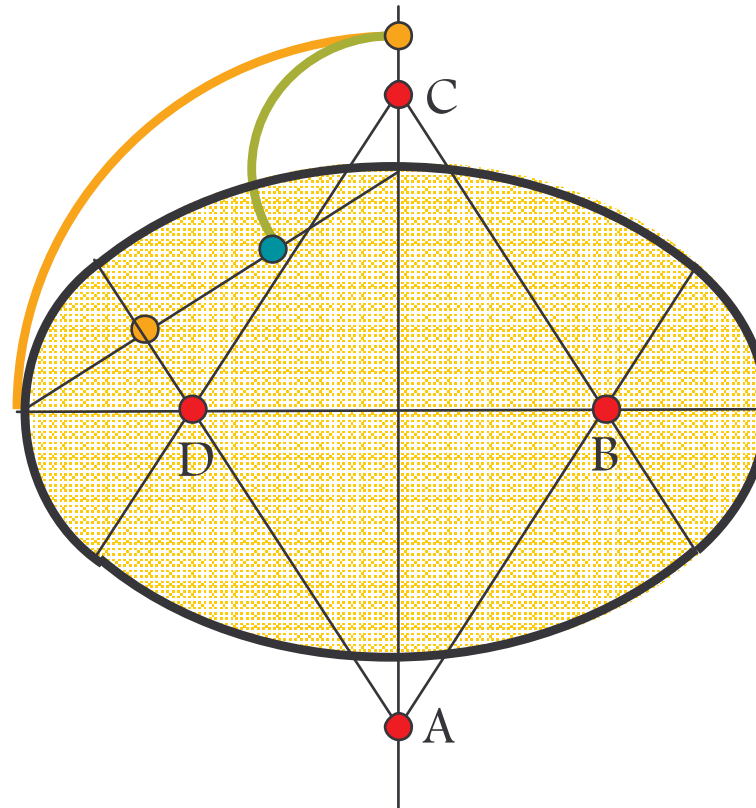
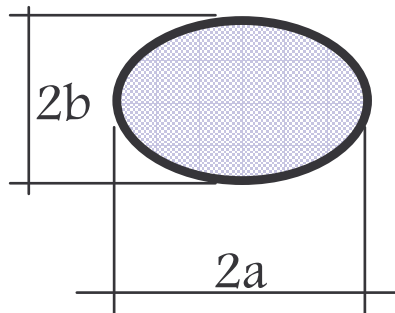
ELLIPSE

- Exact method 2



- Approximate Method

4-centered ellipse

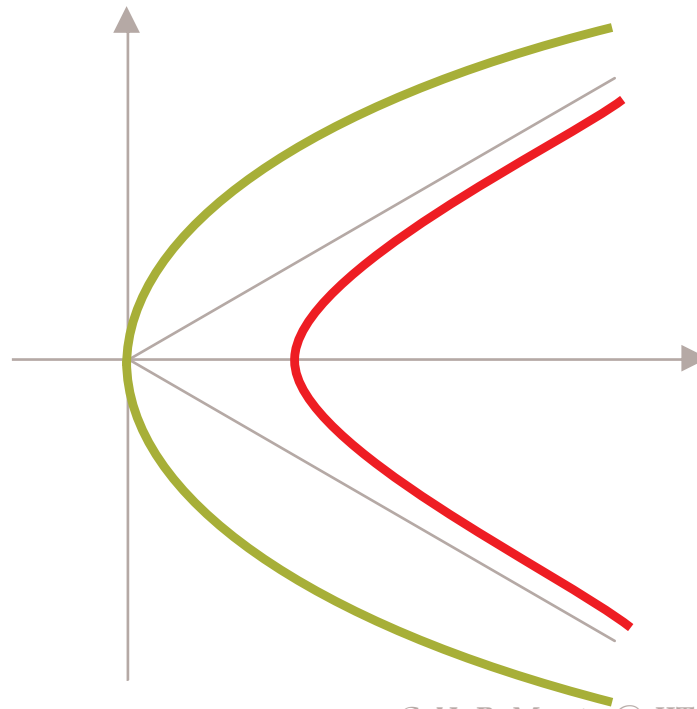


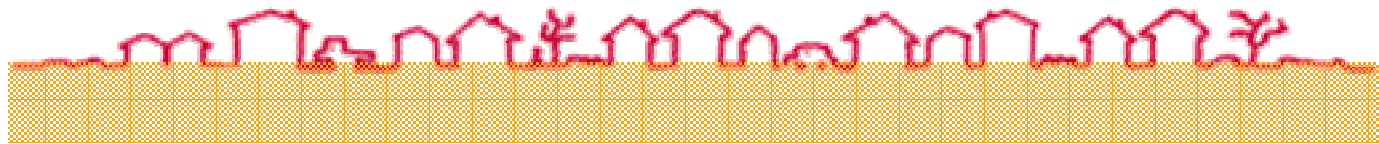
OTHERS

- Draw at home

- Parabola

- Hyperbola





Have a Great Day!!

