21MES102L
Engineering Graphics and Design
School of Mechanical Engineering

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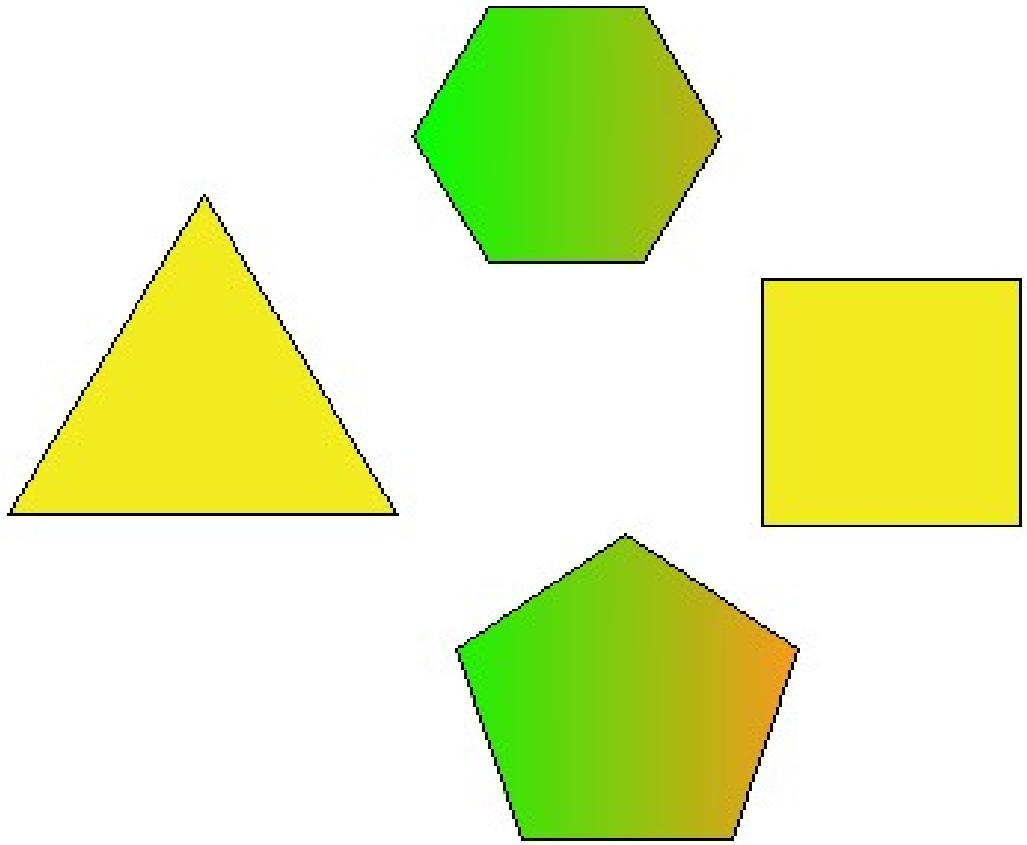
Engineering Graphics and Design

E1: Introduction, Lettering and 2D Geometrical Constructions



Topics Covered

- Principles and standards followed in Engineering Graphics
- Significance of Design and Drawing
- Drafting Software and its Tools
- Lettering, Title block and Constructing 2D Geometry

Engineering Drawing

- Language of Engineers
- Communicate ideas and information from one mind to another
- Graphic representation of an object
- Result of creative thought by an Engineer or Technician

Projection

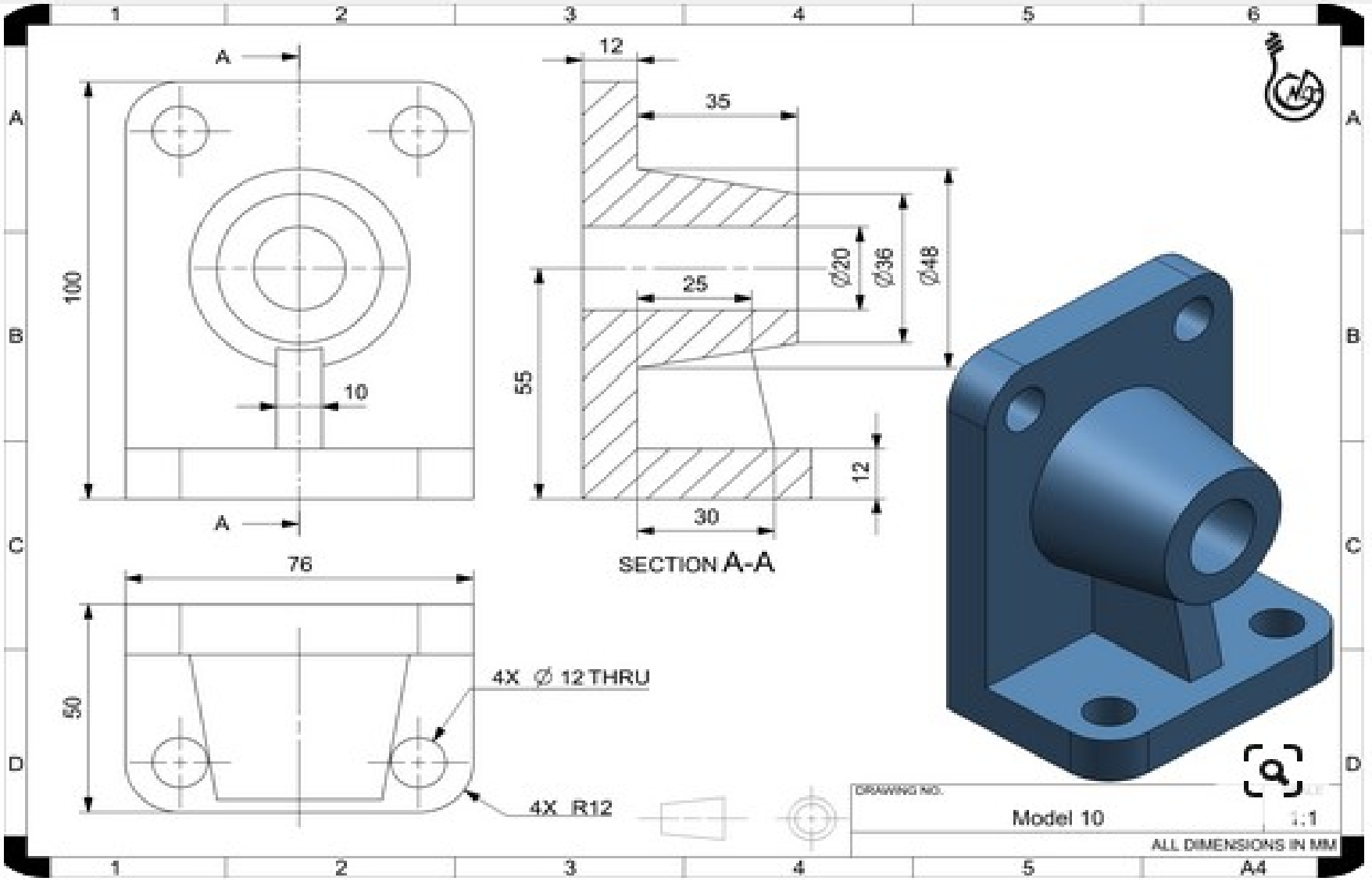
- Drawing or representation of an entity or object on an imaginary plane or planes.
- Depends on four components
  - The actual object
  - The eye of the viewer looking at the object
  - The imaginary projection plane
  - Imaginary lines of sight called Projectors

Engineering drawing

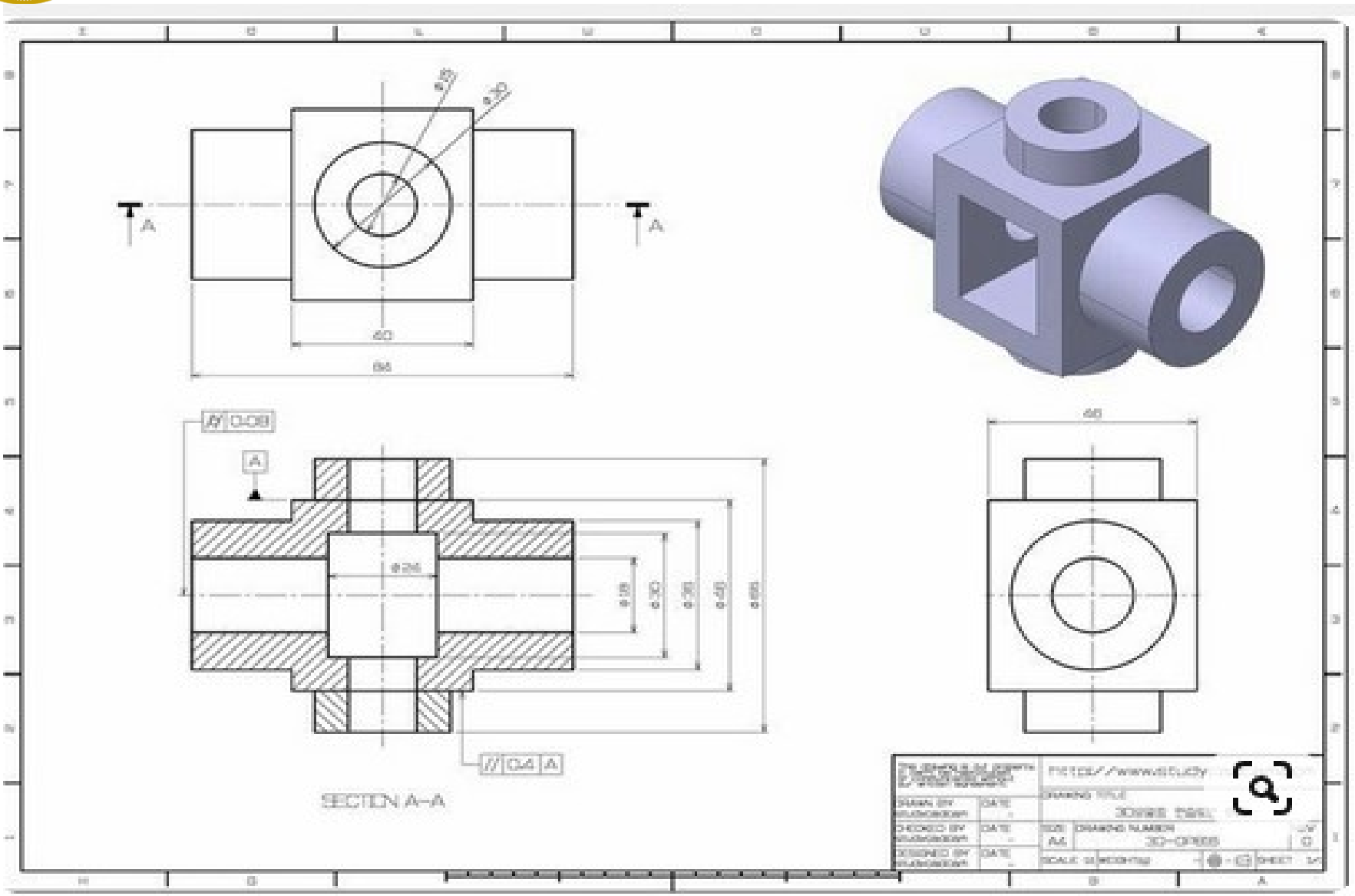
Contains following information:

- Shape of an object
- Exact Sizes and tolerances of various parts of the object
- The finish of the product
- The details of materials
- The company's name
- Date on which the drawing was made
- The person who made the drawing

Engineering Drawing Sample



Engineering Drawing Sample

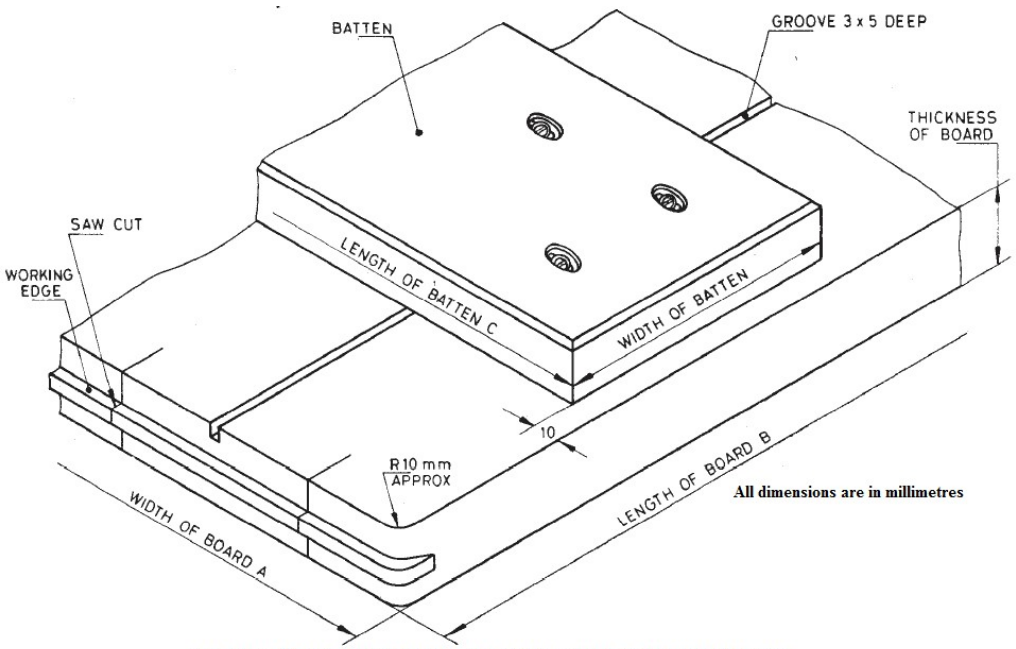


Drawing Instruments

Drawing Board

IS 1444 : 1989 – Clauses 3.1 and 6.1

All dimensions are in millimetres



DIMENSIONS FOR ENGINEER'S PATTERN DRAWING BOARD

Dimensions of Drawing Boards

IS 1444 : 1989 – Clauses 3.1 and 6.1

All dimensions are in millimetres

Designation	Length x Width B x A	Tolerance on Length/Width	Thickness	Tolerance on Thickness	Tolerance on Straightness of Working Edge	Recommended for Use with Sheet Sizes
D00	1525 x 1220	±5	22	±1	0.25	---
D0	1270 x 920	±5	22	±1	0.25	A0
D1	920 x 650	±5	22	±1	0.25	A1
D2	650 x 470	±5	22	±1	0.1	A2
D3	500 x 350	±5	22	±1	0.1	A3

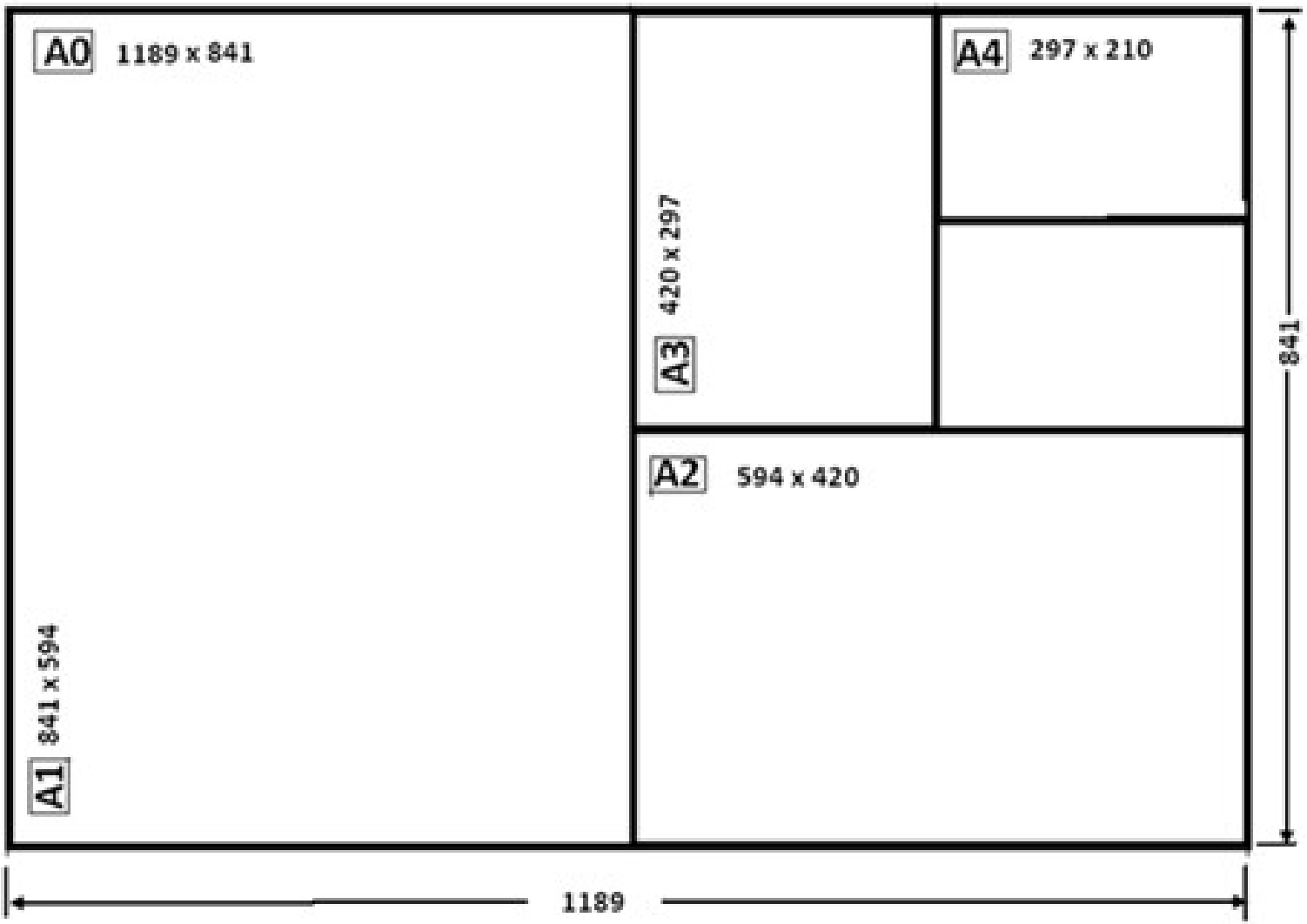
Dimensions of Drawing Sheet

IS 10711 : 2001 and ISO 5457 : 1999

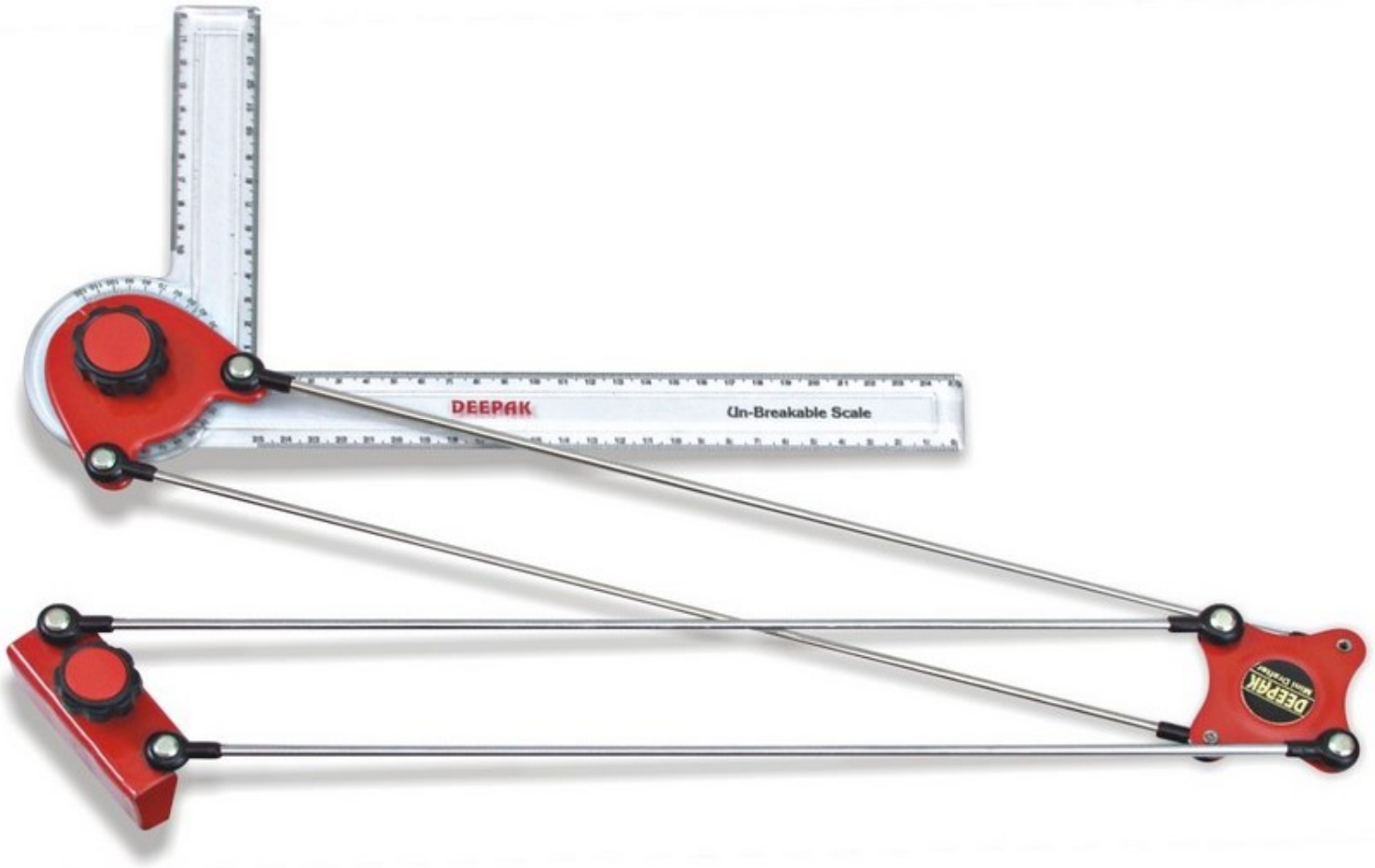
All dimensions are in millimetres

Designation	Size
A0	841 x 1189
A1	594 x 841
A2	420 x 594
A3	297 x 420
A4	210 x 297

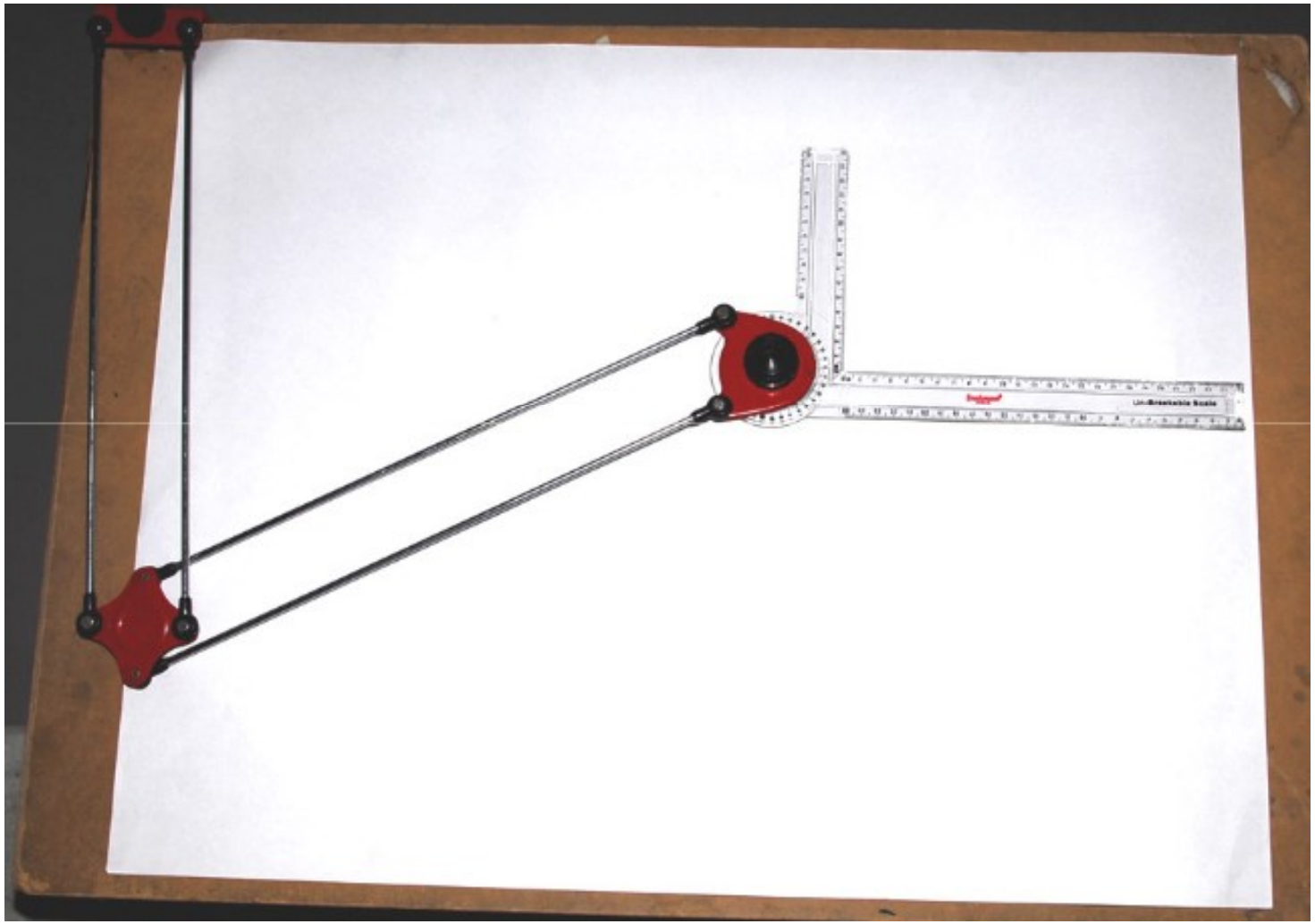
Layout of Drawing Sheets



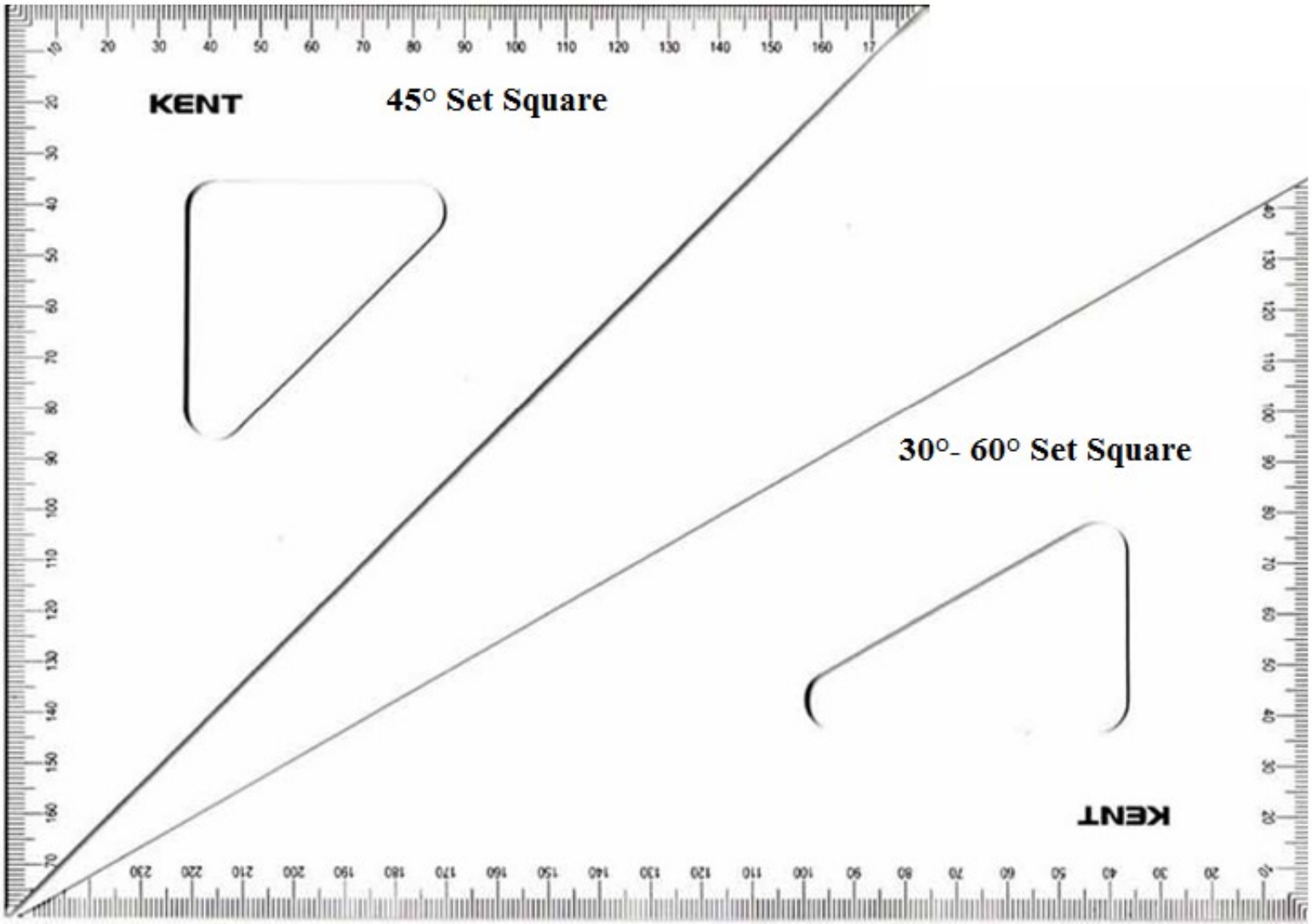
Mini – drafter



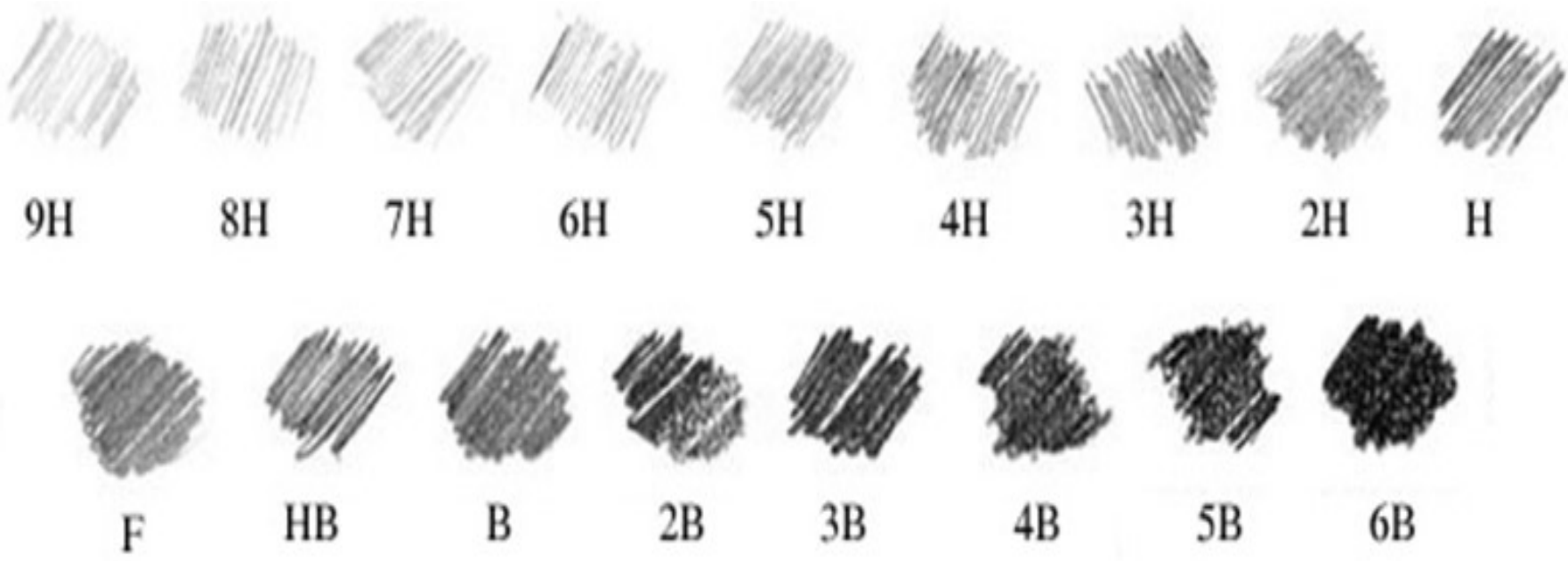
Fixing Of Mini Drafter in Drawing Board



Set Squares



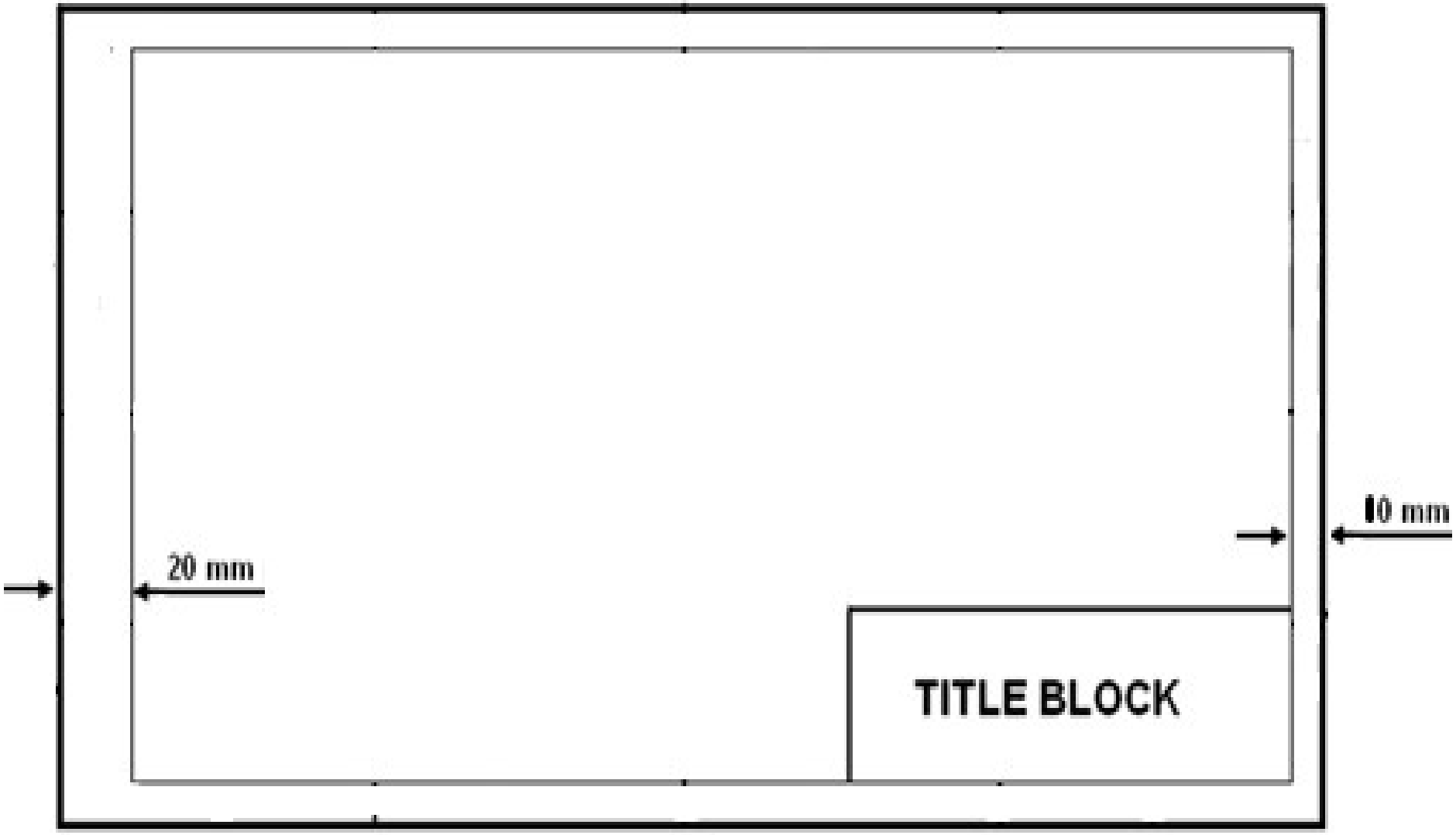
Shades of Drawing Pencils



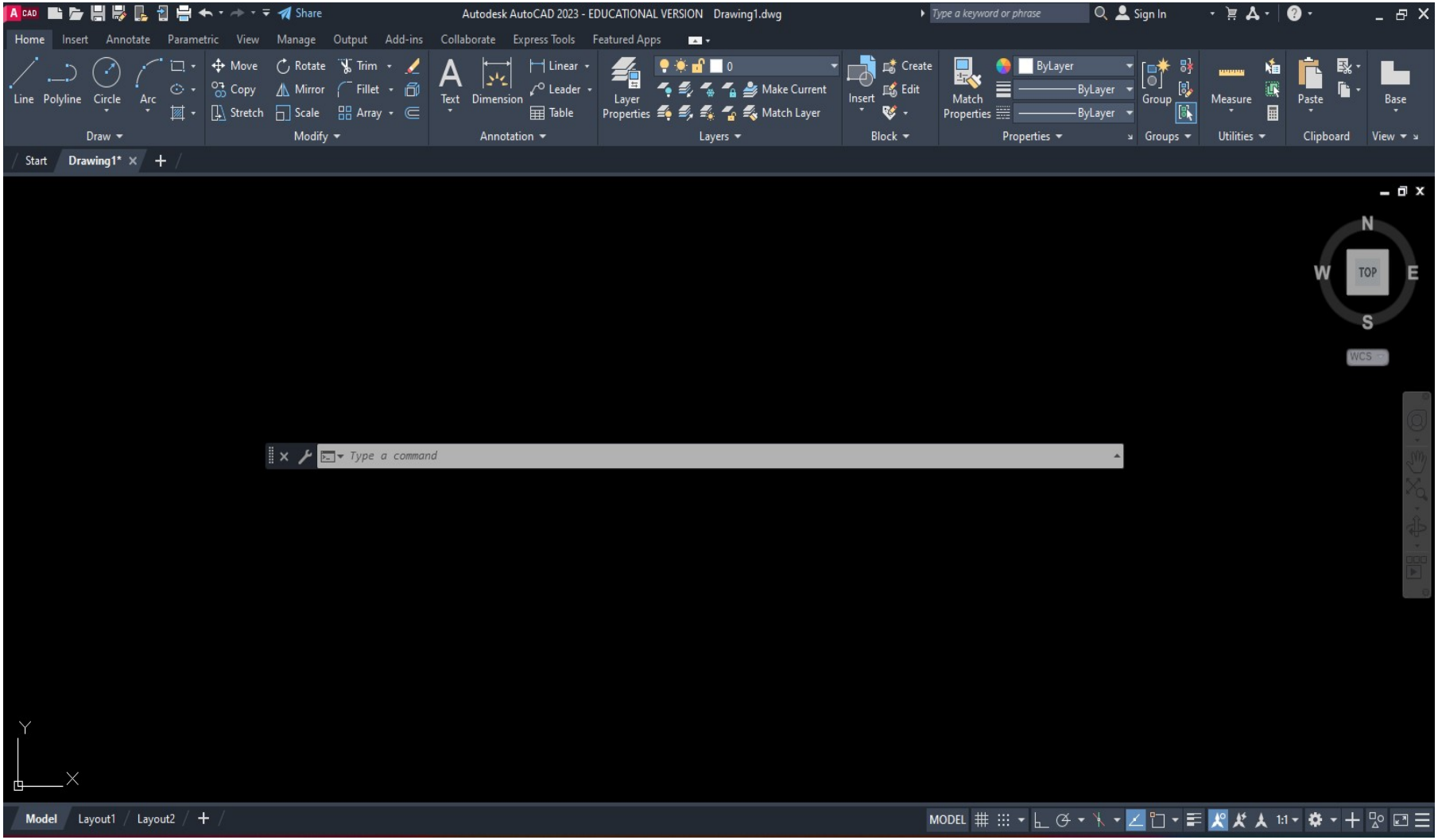
Drawing Instrument Box

Eraser Sharpener Clips

Layout of Drawing Sheet



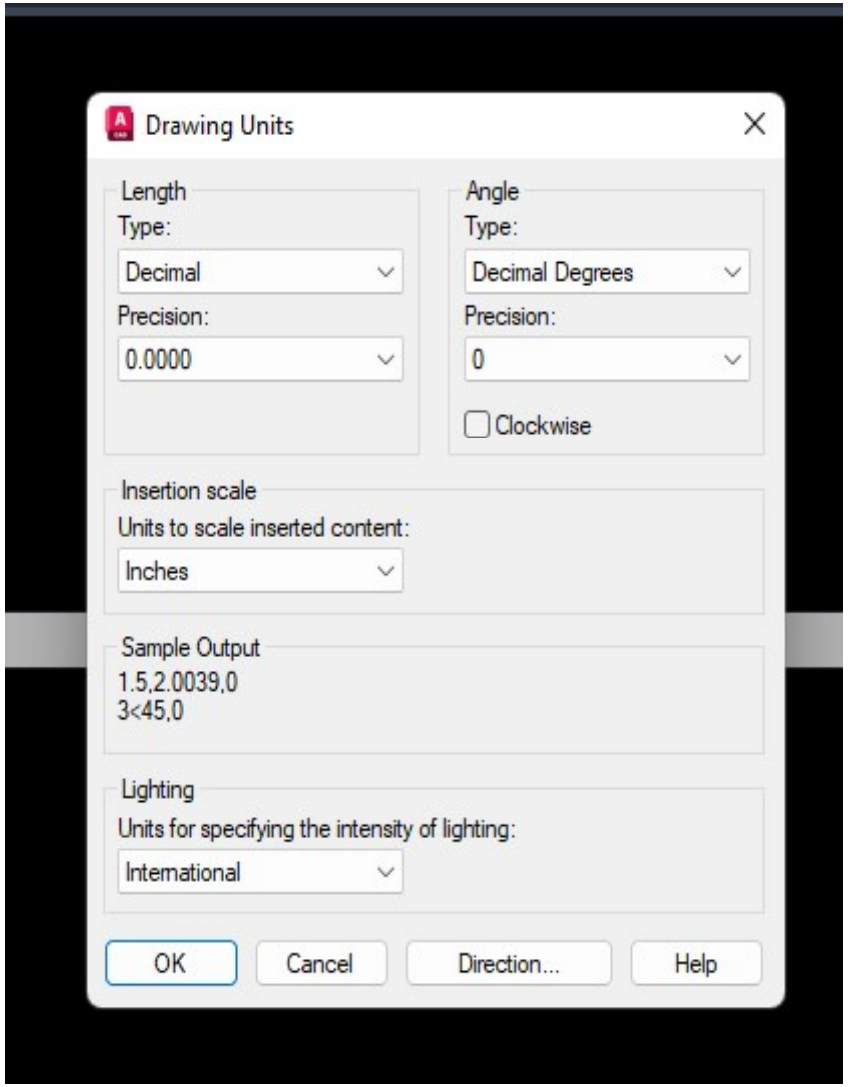
Auto Cad 2023 Working Space

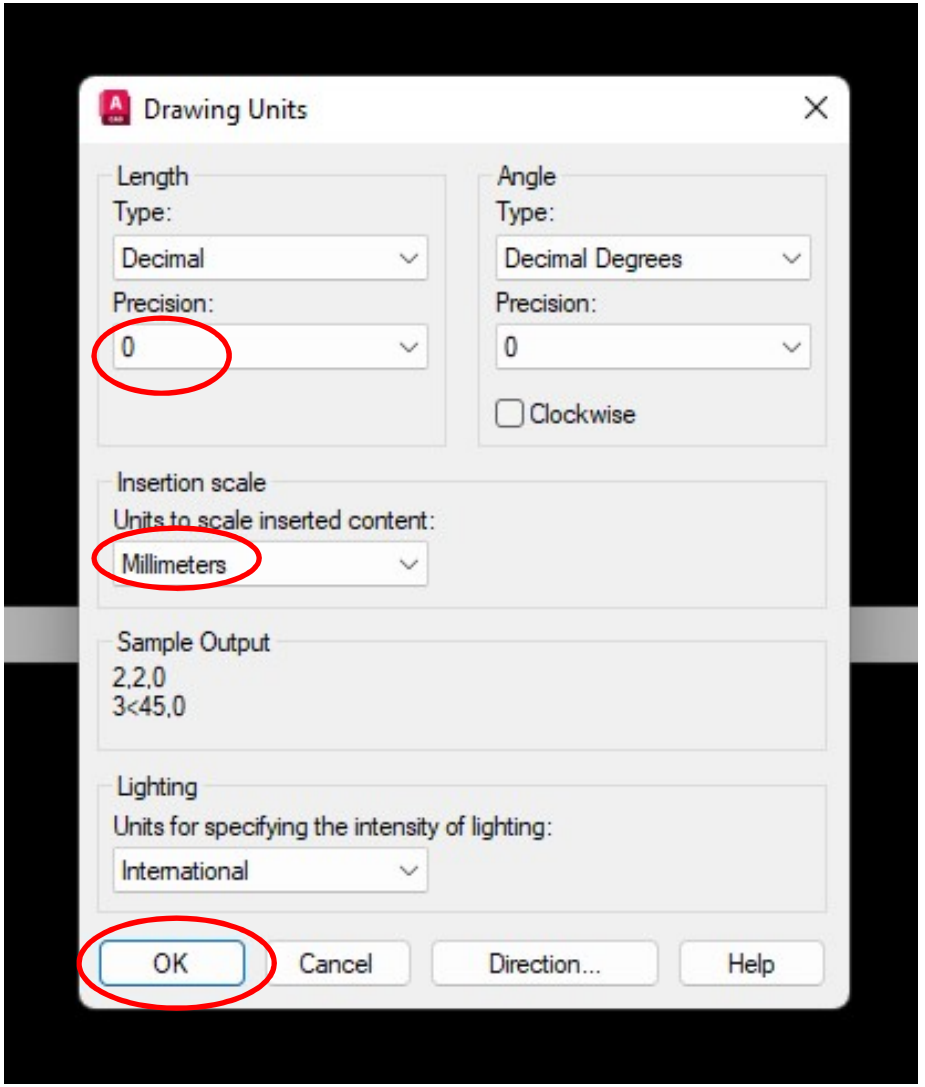


Auto Cad 2023 Working Space Switching

Select DRAFTING & ANNOTAION

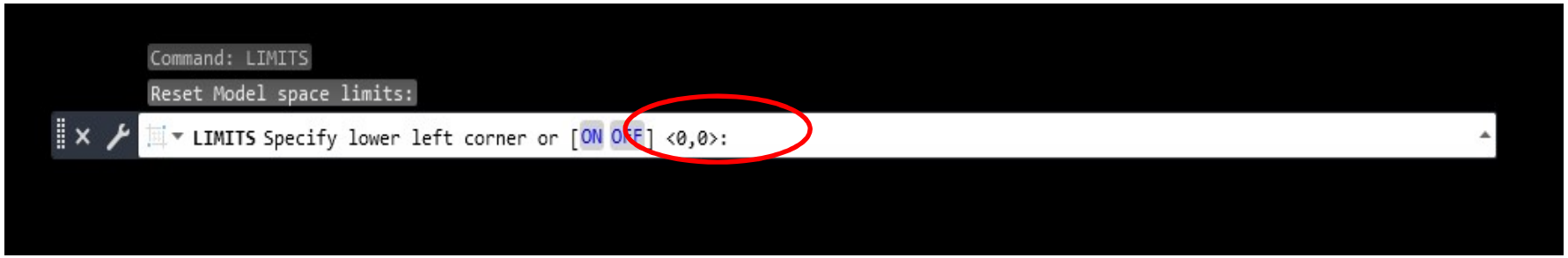
Initial setup of workspace in Auto Cad



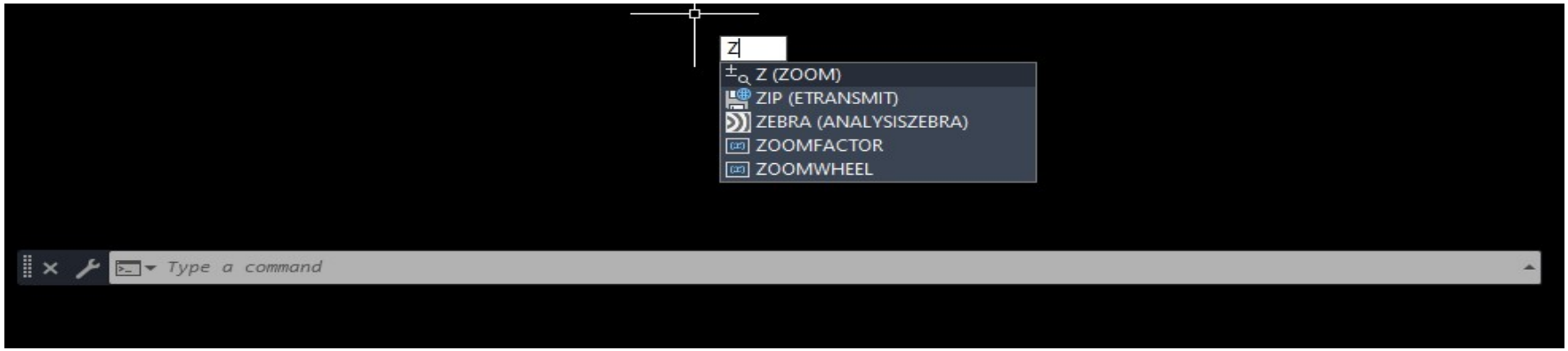


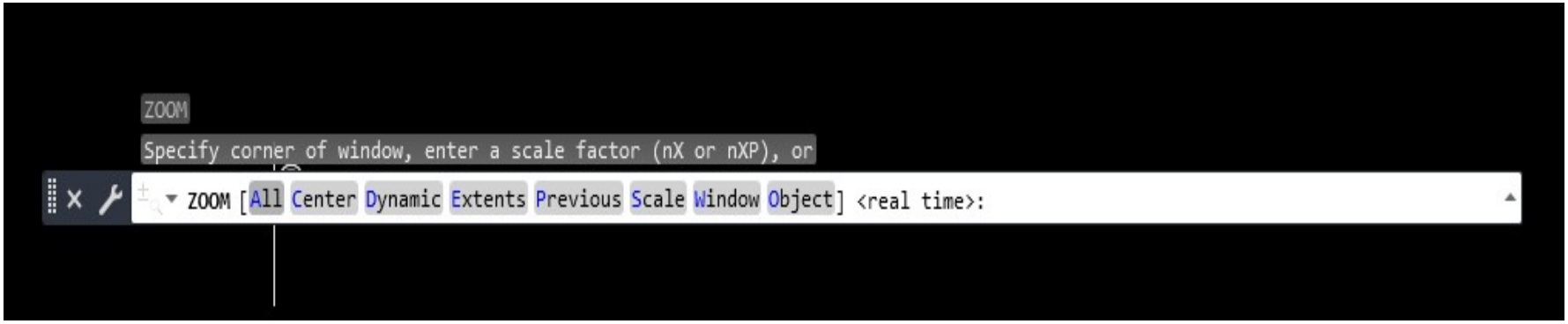
- Type UN or UNITS
- Set the Precision for 0

- Set the Units in Millimeters



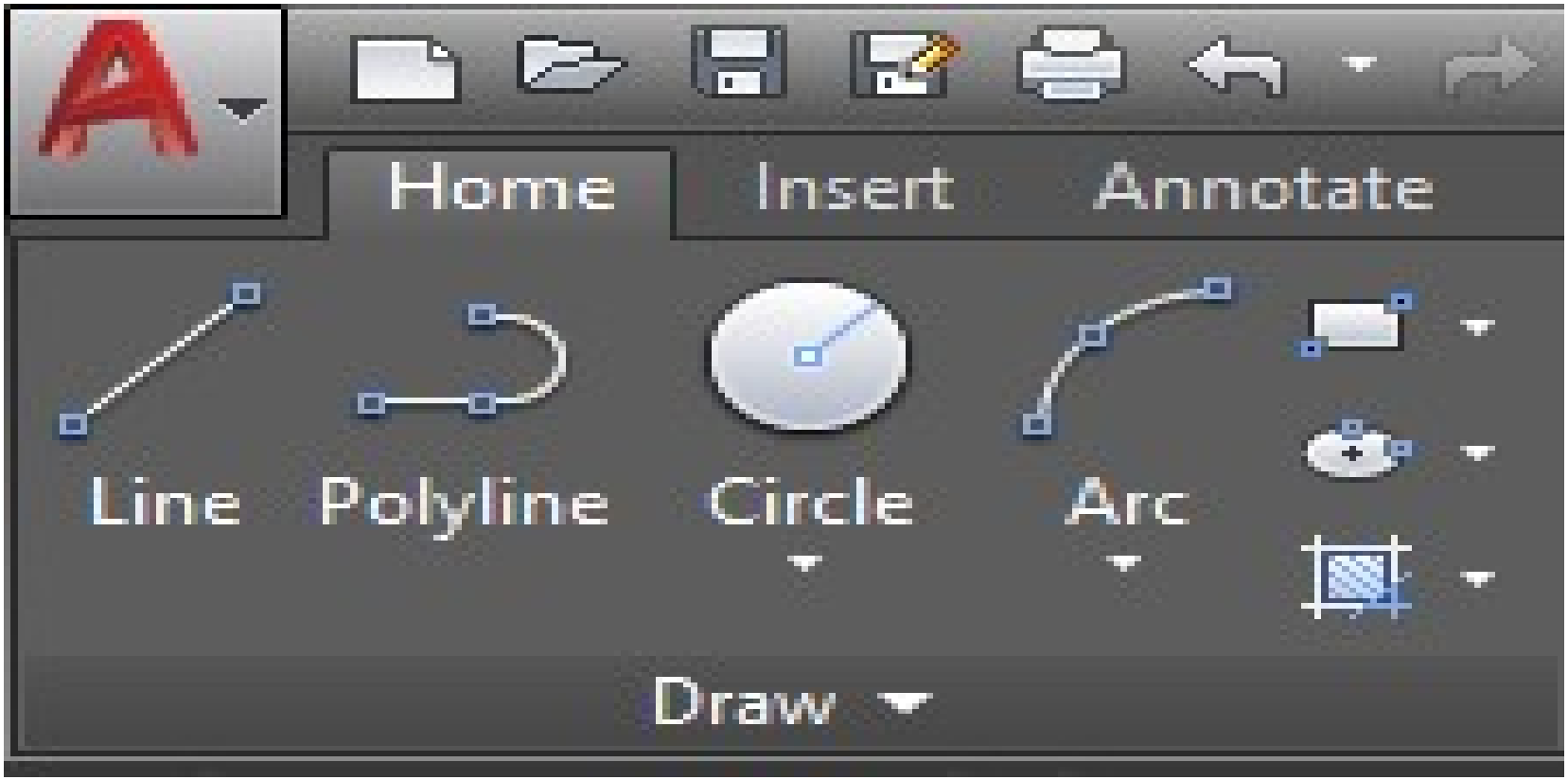
- Type **LIMITS** Press Enter
- Specify the Lower Left Corner as **0,0** Press Enter
- Specify the Upper Right Corner as **210,297** Press Enter



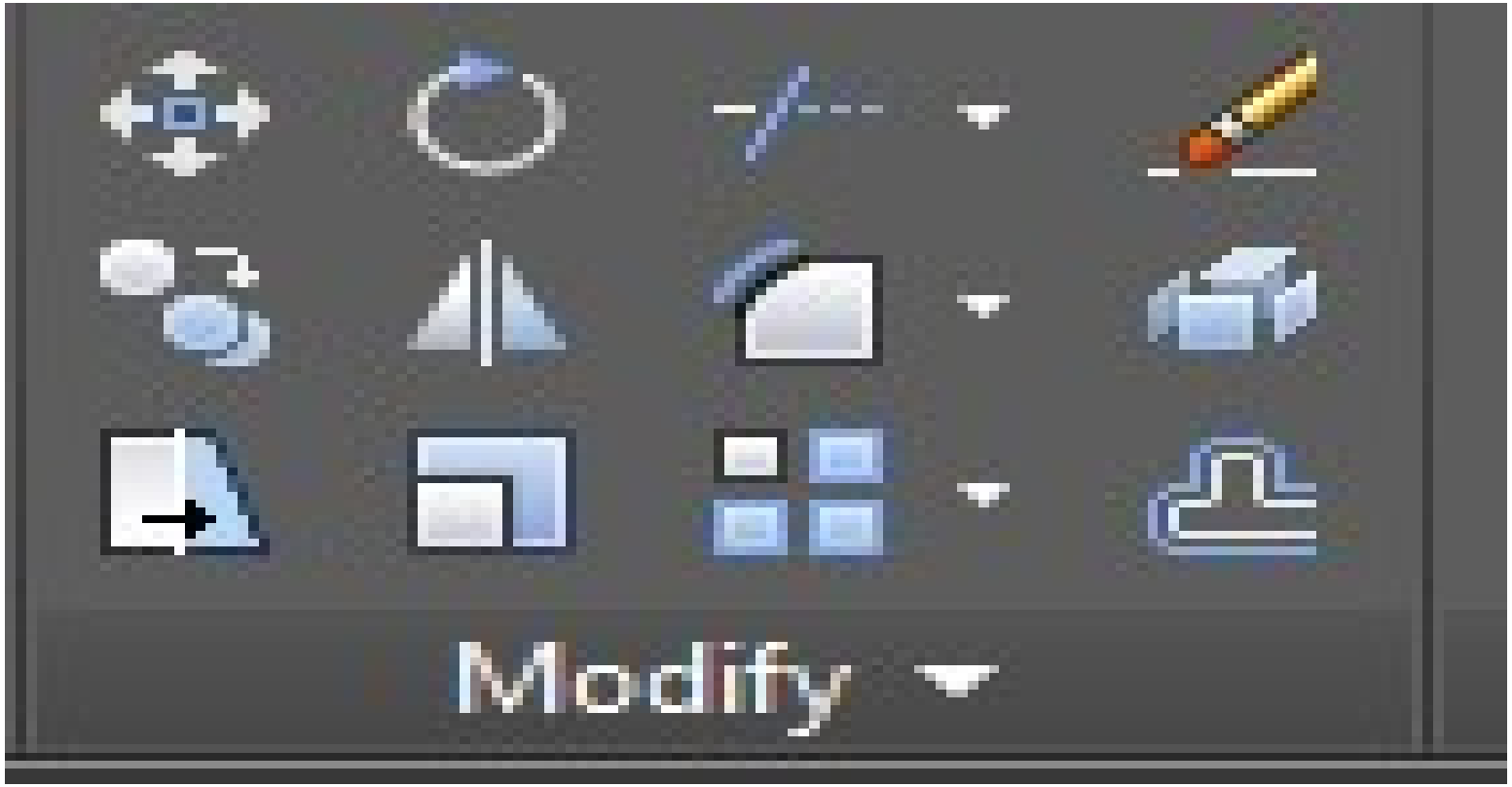


- Type **ZOOM** Press Enter
- Type **ALL** Press Enter

Introduction to Auto CAD



DRAW TOOL BAR



MODIFY TOOL BAR

Draw Tool Bar Commands

- Draw Tool Bar commands are used to draw the basic drawing entities like point, line. circle, rectangle, polygon, ellipse, arcs etc.

Modify Tool Bar Commands

- The Modify Tool Bar commands are used to edit or modify the Existing Drawings.

DRAW TOOL BAR

Name of Command	Use of Command	Input of Command
POINT	To draw a point in specific location	Type POINT
LINE	To draw a line by defining Start Point & End Point	Type LINE
CIRCLE	To draw a circle of specific radius or diameter	Type CIRCLE

DRAW TOOL BAR

Name of Command	Use of Command	Input of Command
ARC	To draw an arc By defining the two or three points	Type ARC
SPLINE	To draw smooth curve	Type SPLINE
POLYGON	To draw a polygon for required number of sides	Type POLYGON

DRAW TOOL BAR

Name of Command	Use of Command	Input of Command
RECTANGLE	To draw a rectangle for required L & B.	Type RECTANGLE
ELLIPSE	To draw an ellipse by defining major and minor axis	Type ELLIPSE
TEXT	To add textual content as required.	Type TEXT

MODIFY TOOL BAR

Name of Command	Use of Command	Input of Command
ERASE	Erase or delete an entity	Type ERASE
MOVE	To move an entity from one position to another position.	Type MOVE
COPY	To make one or multiple copies of an entity.	Type COPY

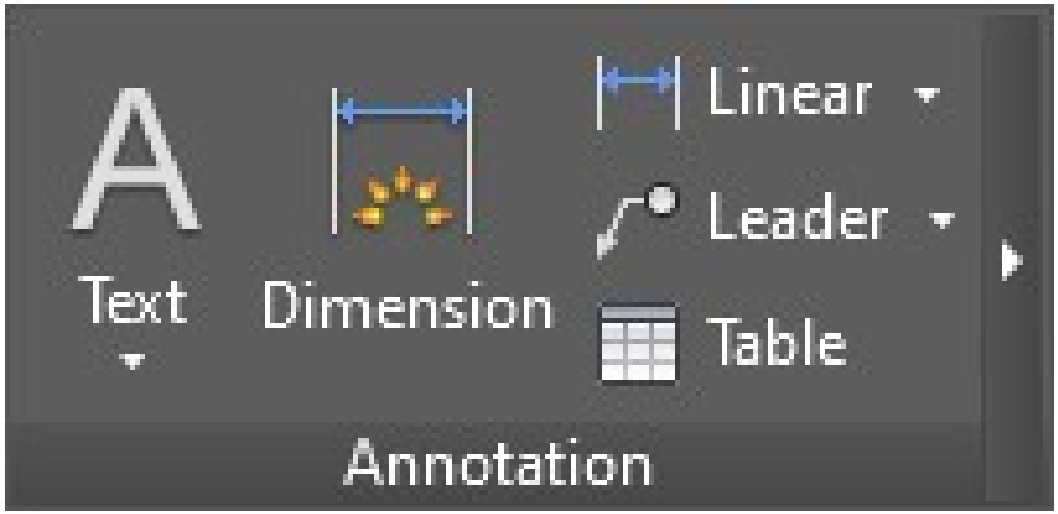
MODIFY TOOL BAR

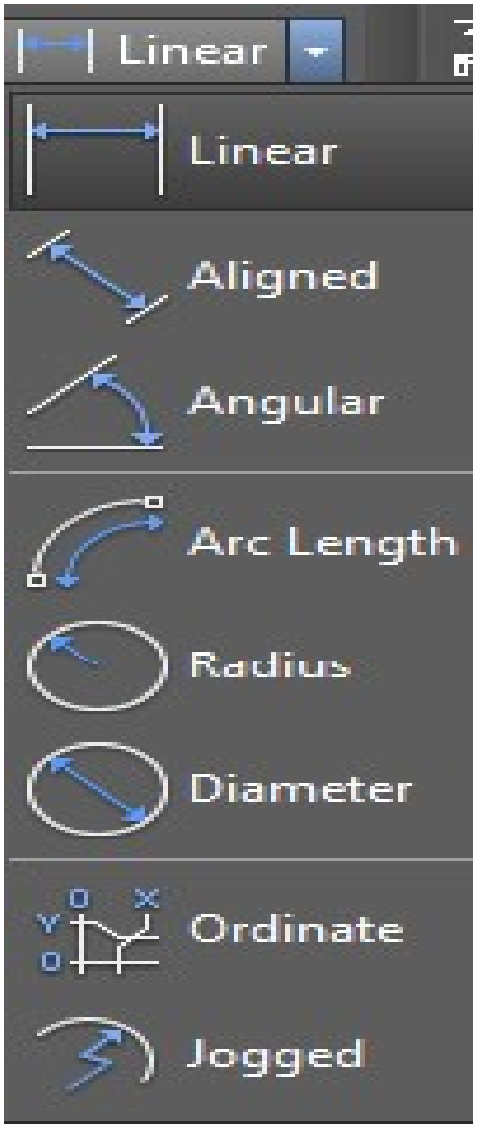
Name of Command	Use of Command	Input of Command
SCALE	For enlarging or reducing the size of a drawing	Type SCALE
MIRROR	To make a copy of a drawing opposite to it like a mirror image	Type MIRROR
ARRAY	To make more copies of an entity in a rectangular or circular path	Type ARRAY
ROTATE	To rotate an entity.	Type ROTATE

MODIFY TOOL BAR

Name of Command	Use of Command	Input of Command
TRIM	To cut and remove a portion of an entity.	Type TRIM
EXTEND	To extend an entity to the nearest boundary.	Type EXTEND
FILLET	To make rounded off sharp corners with specific radius.	Type FILLET
OFFSET	To make a copy of an entity to specific side of the drawing with specific distance from it.	Type OFFSET

ANNOTATION TOOL BAR





- ANNOTATION - TEXT command for typing TEXT in Drawing area
- ANNOTATION - DIMENSION command for applying dimension for the DRAWN geometry or a solid.

LETTERING PRACTICE

ABCDEFGHIJKLMN

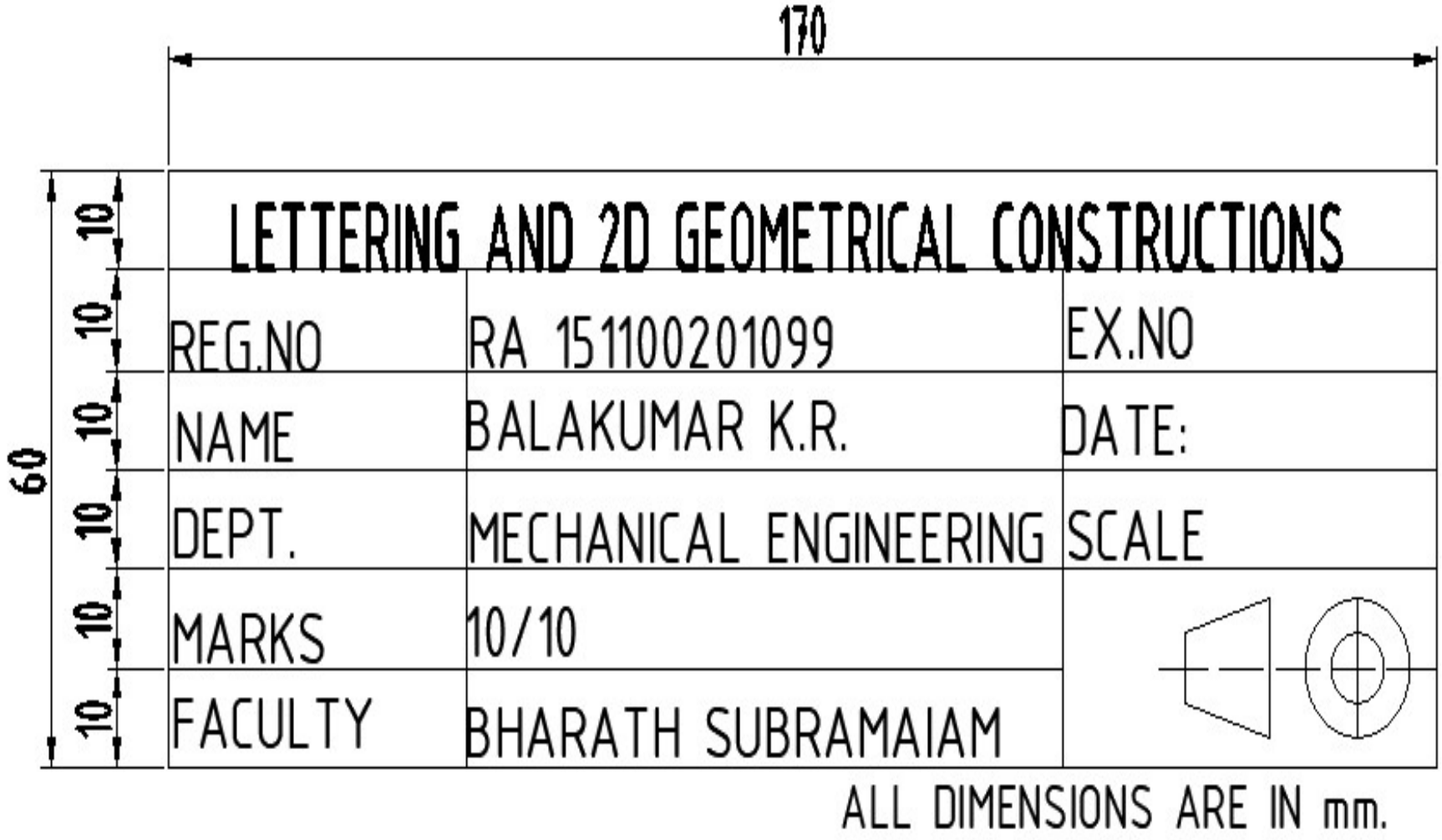
OPQRSTUVWXYZ

abcdefghijklmn

opqrstuvwxyz

01234567689

Title Block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LETTERING AND 2D GEOMETRICAL CONSTRUCTIONS
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FACULTY
BHARATH SUBRAMAIAM
ALL DIMENSIONS ARE IN mm.

REFERENCE BOOKS

- JEYAPOOVAN T, “ENGINEERING GRAPHICS AND DESIGN”, 2023, Vikas Publishing House Pvt Ltd,
- K.V.NATARAJAN, “Engineering Graphics”, 2015, Dhanalakshmi Publishers.