INTRODUCTION OF ENGINEERING DRAWING

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DRAWING

- The art of representation of an object by systematic lines on a paper is called drawing.

Classification of Drawing :- The drawing can be classified in to two groups :-

1. Artistic Drawing (Free Hand Drawing or Sketching)
2. Engineering Drawing (Instrument Drawing).

Drawings
(Some Types)

Nature Drawings
(landscape, scenery etc.)

Geographical Drawings
(maps etc.)

Botanical Drawings
(plants, flowers etc.)

Zoological Drawings
(creatures, animals etc.)

Portraits
(human faces, expressions etc.)

Engineering Drawings, ***(projections.)***

Building Related Drawings.

Machine component Drawings

Orthographic Projections
(Fv,Tv & Sv.-Mech.Engg terms)
(Plan, Elevation- Civil Engg.terms)
(Working Drawings 2-D type)

Isometric (Mech.Engg.Term.)
or Perspective(Civil Engg.Term)
(Actual Object Drawing 3-D)

ARTISTIC DRAWING

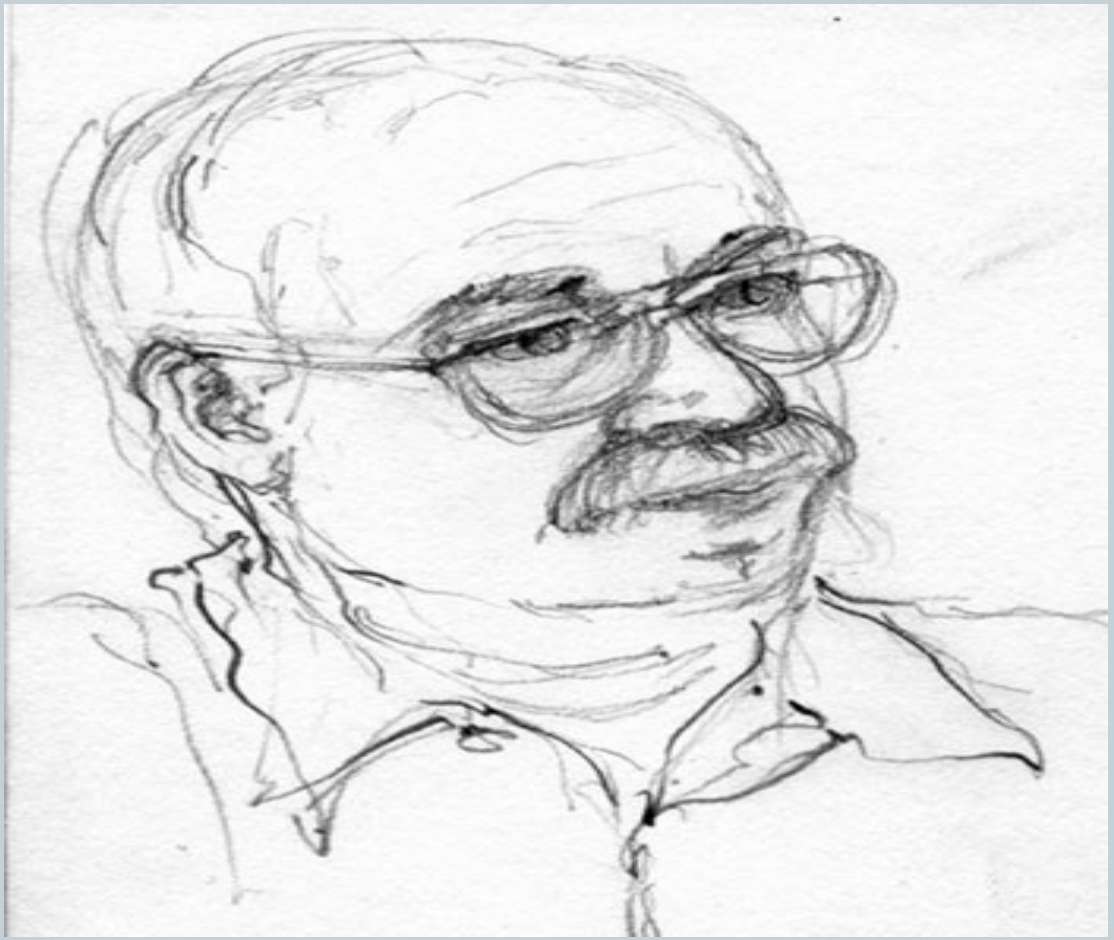
Artistic Drawing :- The art of representation of an object on a paper by the artist by his imagination or by keeping the object before him is called artistic drawing.

NO DIMENSIONS ARE GIVEN IN THE ARTISTIC DRAWING.

It is commonly used by the artists.

For e.g.:- Portrait of any person, painting, advertisements boards etc.

Artistic Drawing (Sketch of an old man)



ENGINEERING DRAWING

- The art of representation of any engineering object on a piece of paper is called Engineering drawing.

It is meant for communicating his ideas, thoughts and designs to others.

Types of Engineering Drawing

- Mechanical Engineering Drawing (machines , machine parts etc)
- Civil Engineering Drawing (roads, buildings, bridges, dams etc)
- Electrical Engineering Drawing (motors, generators, poles , towers etc)
- Computer Engineering Drawing
- Architectural Engineering Drawing
- Production Engineering Drawing
- Electronics Engineering Drawing

DRAWING INSTRUMENTS

- Drawing board
- Drawing sheet
- Mini Drafter
- T-square
- Pencil
- Eraser
- Set Square
- Scales
- Protractor
- Compass
- Divider
- Sand paper block,
- Drawing pins or cello-tape,
- Duster or handkerchief,
- Circle master, French curves etc.

Drawing Board

Drawing board

- Drawing board is made of soft wooden platens. Almost perfect planning of the working surface of the drawing board is to be ensured. A strip of hard ebony edge is fitted up in a groove on the shorter edge of the board and perfectly lined to provide the guide for the T-square. The standard sizes of the drawing board is shown in Table 1.1 below. D2 size of drawing board is normally recommended for the First year Engineering students.

Drawing Sheet

- Drawing sheet is the medium on which drawings are prepared by means of pencils or pen. Drawing sheets are available in standard sizes as shown in Table 1.2. A standard A0 size sheet is the one with an area of 1 m-2 and having dimensions of 1189 x 841. Each higher number sheet (A1, A2, A3, etc. in order) is half the size of the immediately lower numbered sheet. For drawing practice for first year engineering students A2 size is the preferred drawing sheet. The recommended sizes obtained for various drawing sheets are shown in figure:

Drawing Sheets

Table 1.2 Standard Sizes of Drawing sheets as per BIS

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

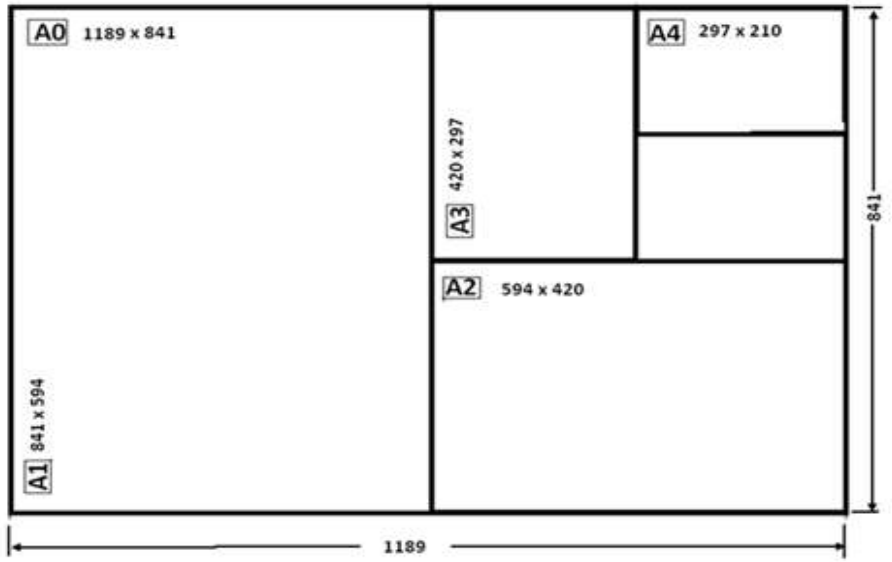


Figure 1. recommended sizes obtained for various drawing sheets

Dimensions of Drawing boards

Table 1.1. Standard dimension of Engineer's Drawing Board

Designation	Length x Width (mm)	Recommended for use with sheet sizes
D0	1500 x 1000	A0
D1	1000 x 700	A1
D2	700 x 500	A2
D3	500 x 500	A3

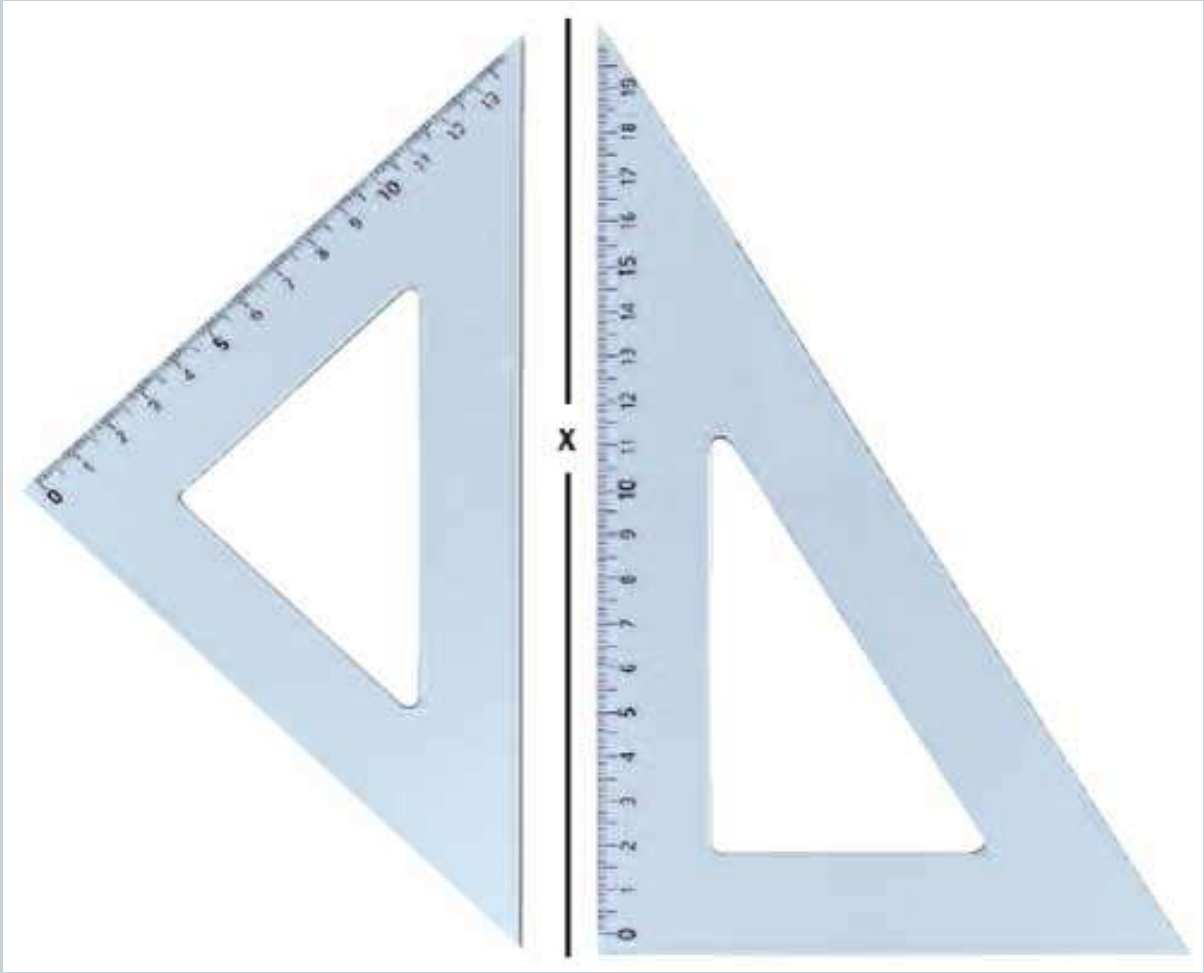
D0 and D1 for drawing offices, for students use – D2

Mini drafter

Mini drafter

- **Mini drafter** is an instrument which can be used for multiple functions in drawing. ... **Mini drafter** is used for drawing horizontal lines, vertical lines, inclined lines, angles, parallel lines, perpendicular lines etc.
- https://www.youtube.com/watch?v=nZvp6Jgw87I

Set-squares (45° – 45° & 30° – 60°)



Set Square

- A **set square** or triangle (American English) is an object used in engineering and technical drawing, with the aim of providing a straightedge at a right angle or other particular planar angle to a baseline.
- A right-angled triangular plate for drawing lines, especially at 90°, 45°, 60°, or 30°particular planar angle to a baseline.

T-square

T-Square

- A **T-square** is a technical drawing instrument used by draftsmen primarily as a guide for drawing horizontal lines on a drafting table. It may also guide a set square to draw vertical or diagonal lines. Its name comes from its resemblance to the letter T. T-squares come in varying sizes, common lengths being 18 inches (460 mm), 24 inches (610 mm), 30 inches (760 mm), 36 inches (910 mm) and 42 inches (1,100 mm).

Protractor (180°, 360°)

Protractor

- Protractor helps you measure angles in degrees.
- Protractors usually have two sets of numbers going in opposite directions.
- Be careful which one you use!
- When in doubt think *"should this angle be bigger or smaller than 90° ?"*

Scale Ruler

Scale Ruler

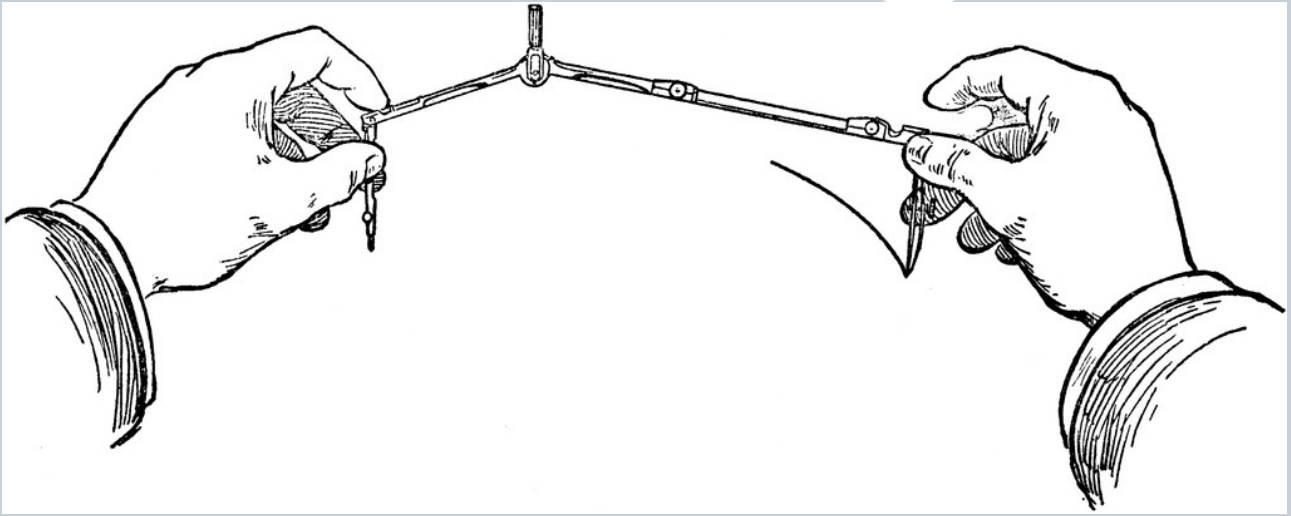
- A **scale ruler** is a tool for **measuring** lengths and transferring **measurements** at a fixed ratio of length; two common examples are an architect's **scale** and engineer's **scale**. ... A device for drawing straight lines is a straight edge or **ruler**. In common usage both are referred to as a **ruler**.

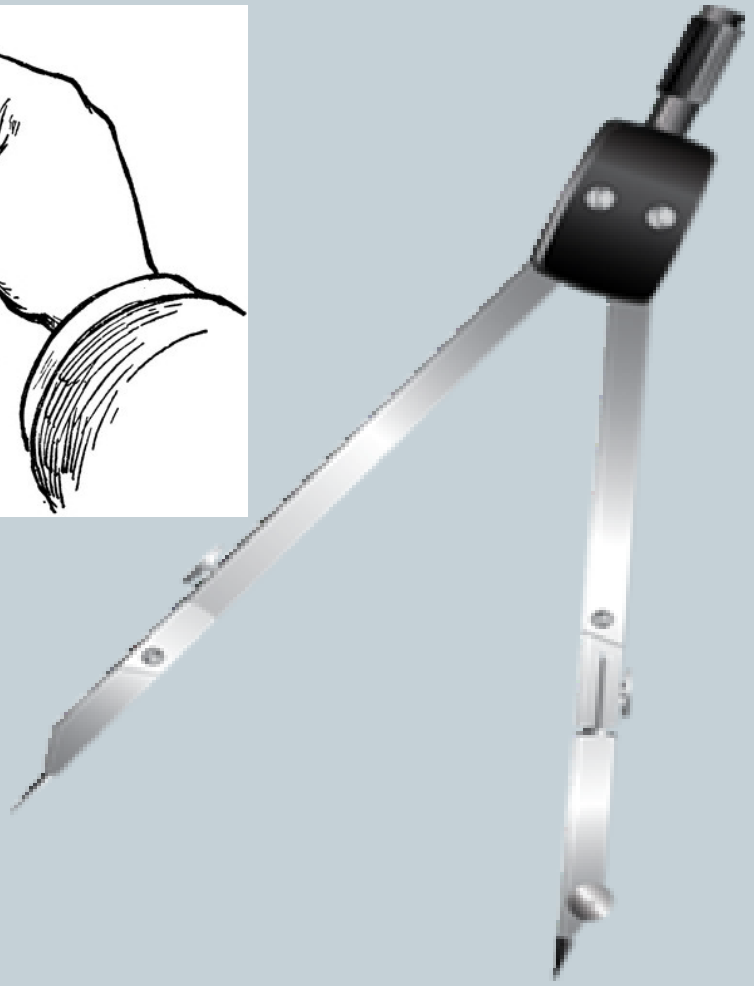
Roll & Draw

Drawing Instruments Box

- Small bow compass.
- Small bow divider
- Lengthening bars.
- Large Size Divider.
- Large size compass with interchangeable legs.

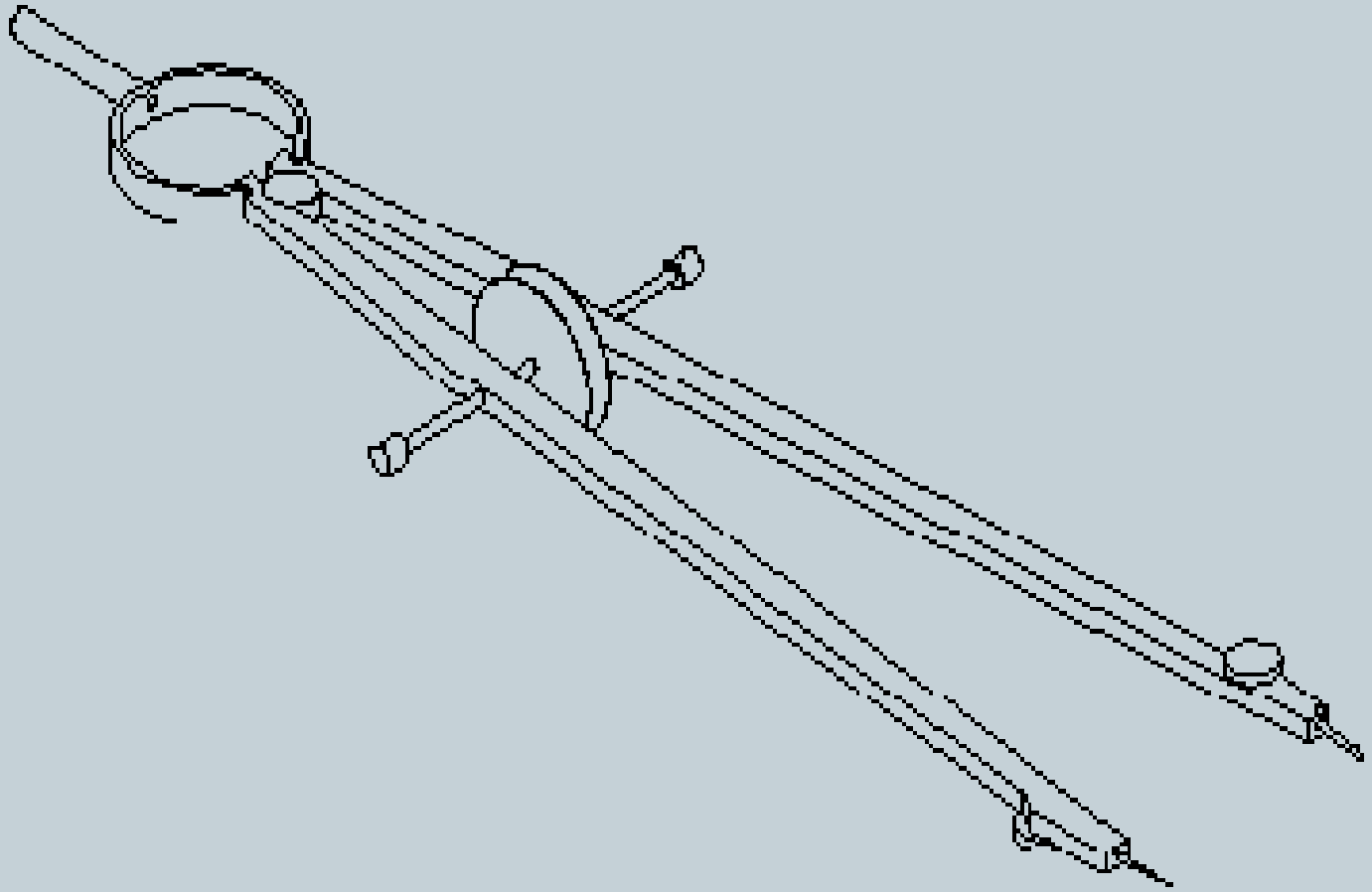
Lengthening bars.





Lengthening bar is used to draw circles bigger than 10 inches.

Small Bow Compass.



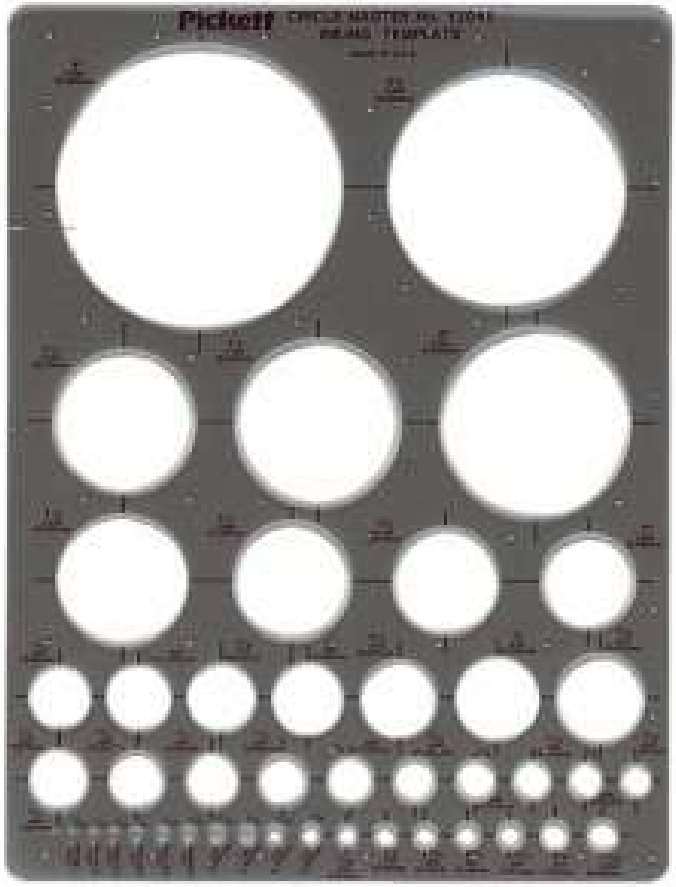
Small Bow Compass.

A compass, is a technical drawing instrument that can be used for inscribing circles or arcs. A bow compass capable of drawing the smallest possible circles.

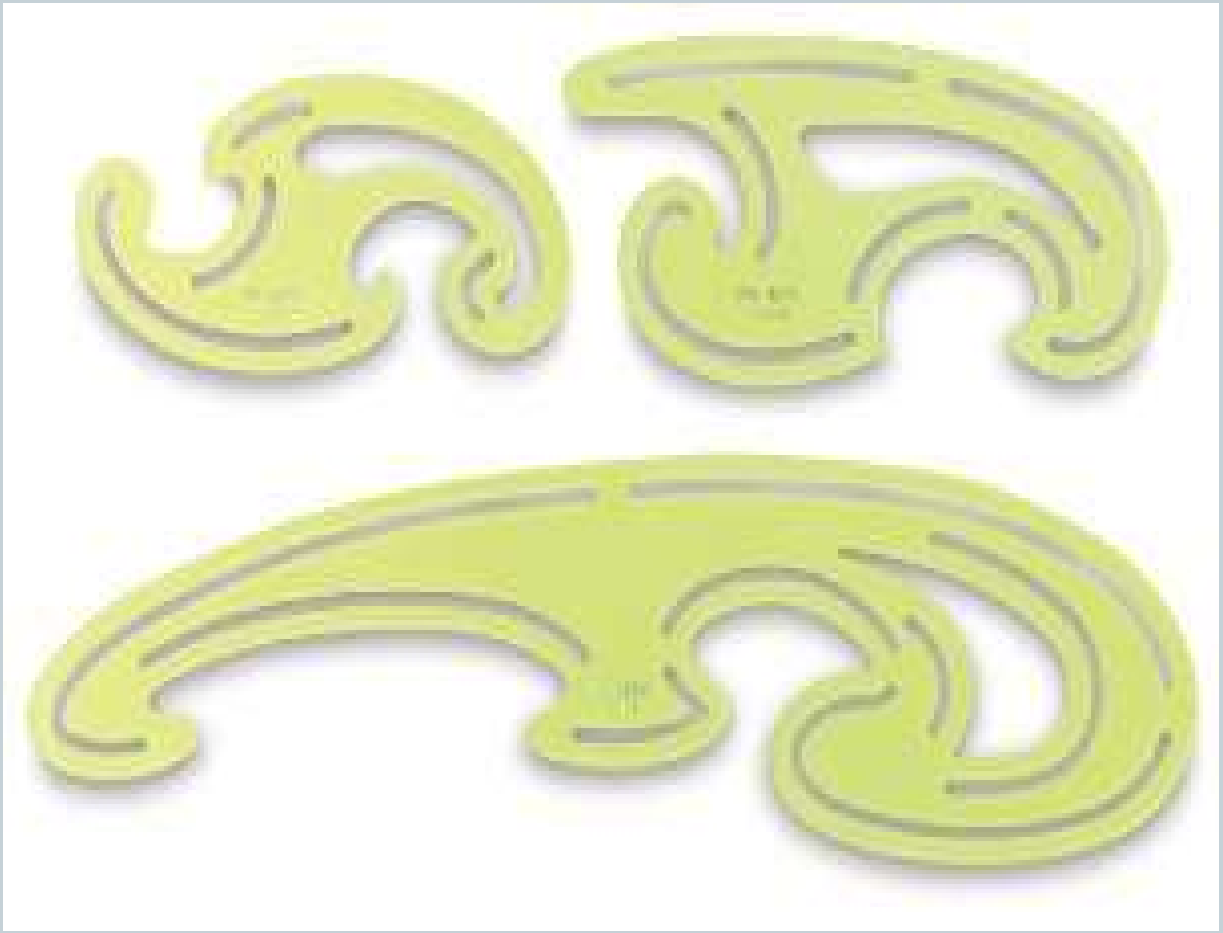
Small Bow Divider

A small divider whose legs ar e connected by a bow-shaped spring, rather than by a joint. A bow divider is used to transfer measurements from one part of a drawing to another.

Circle Master

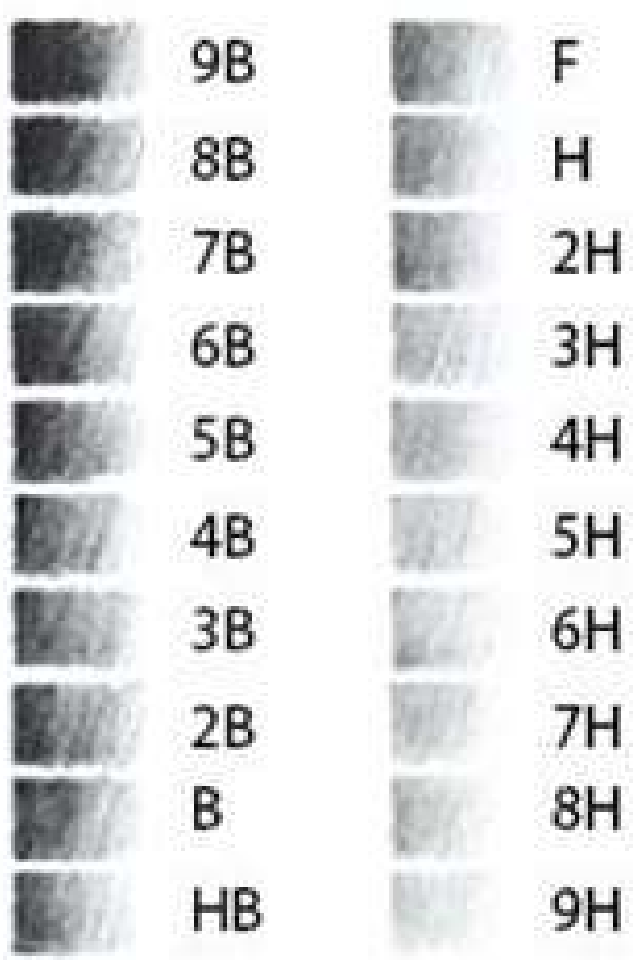


French Curves



Drawing pencil (Lead pencil [Mechanical Pencil], Wooden pencil)

"H" and "B" to note how hard or soft a **pencil** is. Most pencil manufacturers utilize the **HB** grading system. The letter "**H**" is used to indicate the hardness of a pencil's mark. The letter "B" is used to indicate the blackness of a pencil's mark. (a **darker** mark means a softer lead).



Sharpener

Eraser

Drawing pins, clips & cello tape

Drawing pins

Drawing clips

Tape

Duster or handkerchief

Types of Lines

TYPE	ILLUSTRATION	APPLICATION
A – CONTINUOUS THICK		VISIBLE OUTLINES.
B – CONTINUOUS THIN		DIMENSION LINES, LEADER LINES, EXTENSION LINES, CONSTRUCTION LINES OF ADJACENT PARTS, HATCHING AND REVOLVED SECTION.
C – CONTINUOUS THIN-WAVY		IRREGULAR BOUNDARY LINES, SHORT BREAK LINES.
D – SHORT DASHES MEDIUM		HIDDEN OUTLINES & EDGES.

Types of Lines

E – LONG CHAIN THIN		CENTRE LINES, LOCUS LINES, EXTREME POSITIONS OF THE MOVABLE PARTS SITUATED IN FRONT OF THE CUTTING PLANTS AND PITCH CIRCLES.
F – LONG CHAI N LINE THICH AT ENDS AND THIN ELSEWHERE		CUTTING PLANE LINES.
G – LONG CHAIN THICK		TO INDICATE SURFACES WHICH ARE TO RECEIVE ADDITIONAL TREATMENT.
H – RULED LINE & SHORT ZIGZAG THIN.		LONG BREAK LINES.