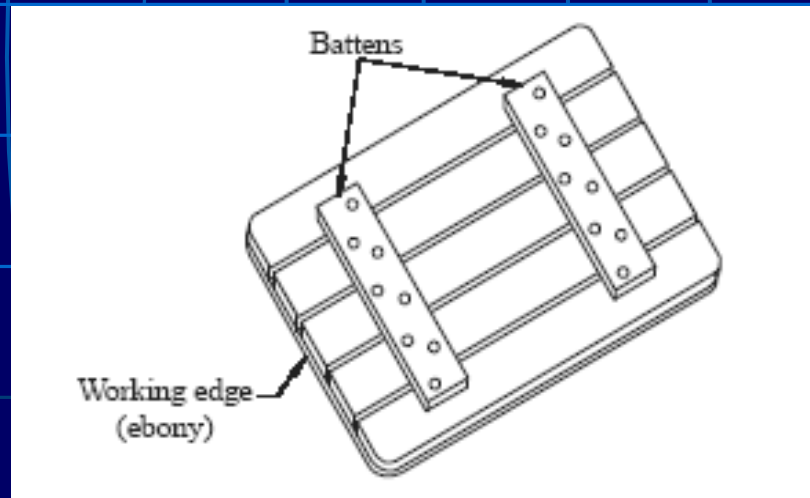


Engineering Drawing Instruments

- Drawing Instruments are used to prepare neat and accurate Drawings
- To a greater extent, the accuracy of the Drawings depends on the quality of instruments used to prepare them
- The following is the list of Drawing Instruments and other materials required
 - **Drawing Board**
 - **Drafter (Drafting machine)**
 - **Set Squares**
 - **Protractor**
 - **Drawing Instrument Box**
 - **Drawing Sheet**
 - **Drawing Pencils**
 - **Drawing Pins/Clips**

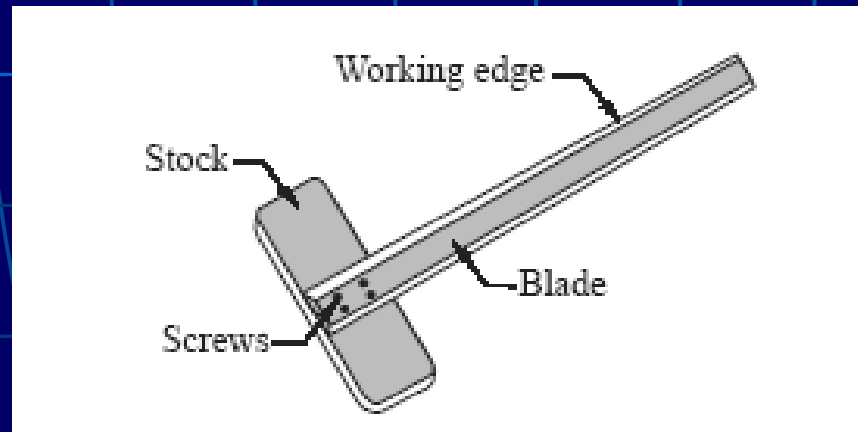
Drawing Board

- Drawing board is made from strips of well seasoned soft wood generally 25 mm thick. It is cleated at the back by two battens to prevent warping
- One of the shorter edges of the rectangular board is provided with perfectly straight ebony edge which is used as working edge on which the T-square is moved while making Drawings



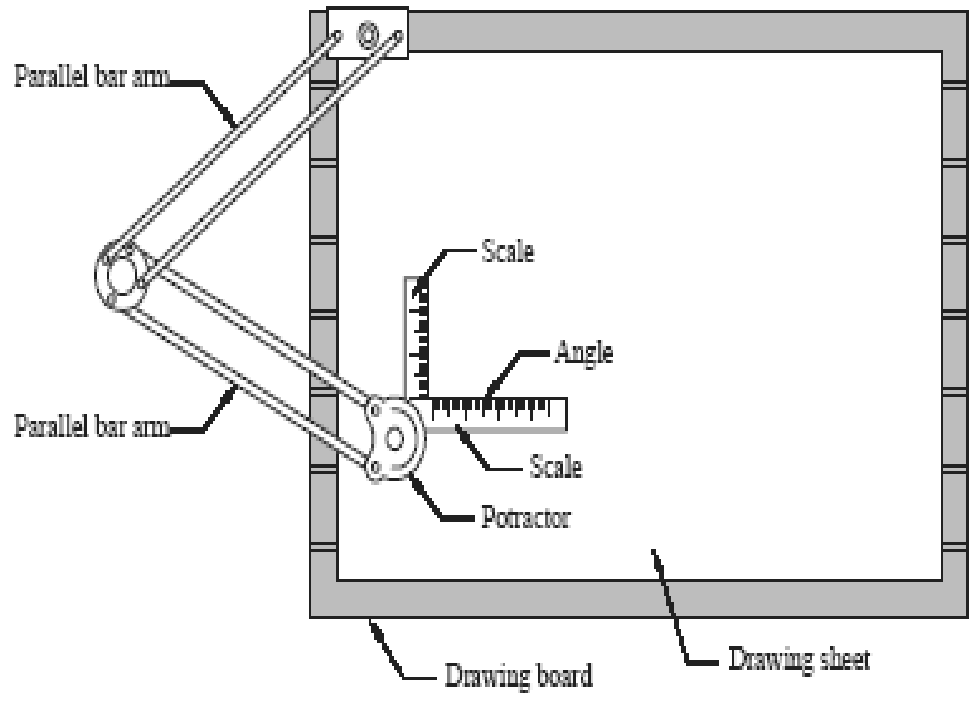
T-square

- T-squares are made from hard wood. A T-square consists of two parts namely the stock and the blade joined together at right angles to each other by means of screws and Pins as shown in figure
- The stock is made to slide along the working edge and the Blade moves on the Drawing board
- The working edge of T-square is used to draw parallel lines, vertical lines or inclined lines at 30° , 60° to the horizontal using set squares



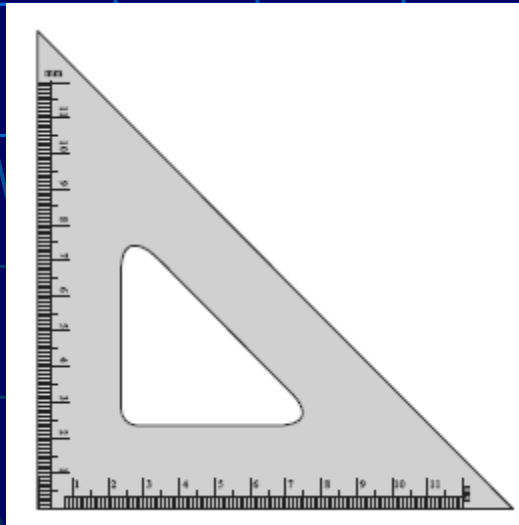
Drafting Machine

- In a Drafting machine, the uses and advantages of T-square, set square, scales, protractors are combined.
- One end of the Drafter is clamped at the left top end of the Drawing board by a screw provided in the drafter
- An adjustable head with a Protractor is fitted at the other end of the Drafter
- Two blades made of transparent celluloid material are fitted to the adjustable head and are perfectly perpendicular to each other
- These blades are used to draw parallel, horizontal, vertical and inclined lines.
- The blades always move parallel to the edges of the board.
- Use of Drafting machine helps in reducing the time required to prepare Drawing

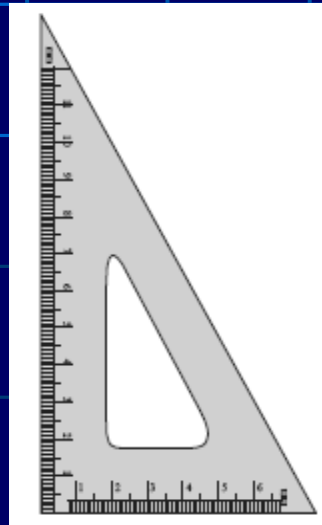


Set squares

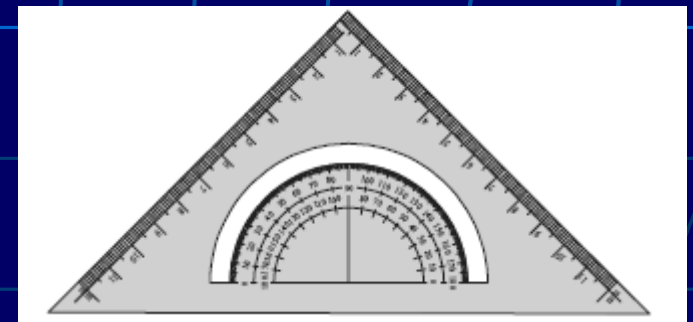
- Set squares are generally made from Plastic or celluloid material
- They are triangular in shape with one corner, a right angle triangle. A pair of set squares (30° – 60°) and 45° (45° set square are generally provided with Protractor) facilitate marking of angles as shown in figures
- They are used to draw lines at 30° , 60° and 45° to the vertical and horizontal



45°Set square



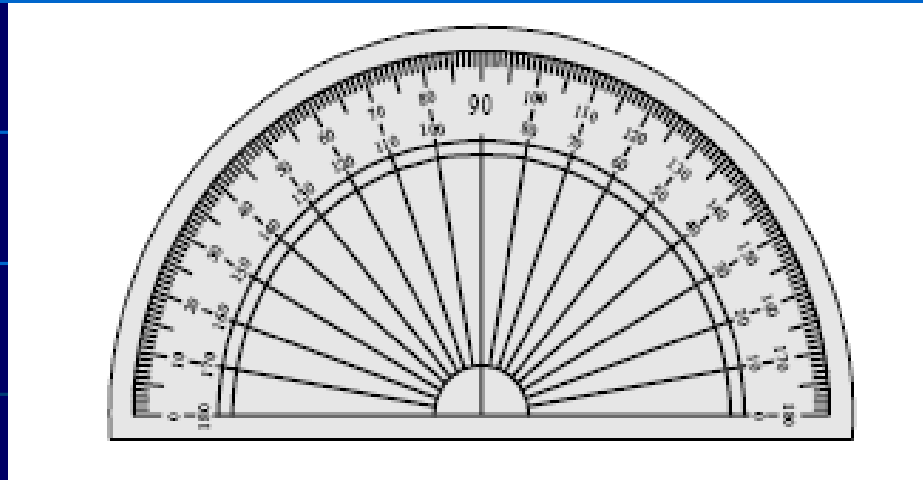
30°-60° Set square



45°Set square with protractor

Protractor

- Protractors are used to mark or measure angles between 0 and 180°
- They are semicircular in shape (of diameter 100mm) and are made of Plastic or celluloid which has more life
- Protractors with circular shape capable of marking and measuring 0 to 360° are also available in the market



Drawing Instrument Box

- Drawing Instruments box are consist of the following instruments:
 - Large size compasses,
 - Large size divider,
 - Small size bow pen, bow divider, and
 - Lengthening bar

Drawing Sheet

- They are available in many varieties and good quality paper with smooth surface should be selected for Drawings which are to be preserved for longer time. Sizes of Drawing Sheets recommended by Bureau of Indian Standards (BIS) is given below:

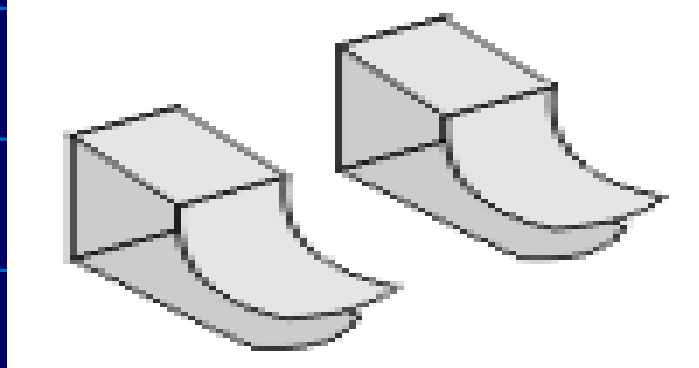
Standard Size of Drawing Sheet			
<i>Designation</i>	<i>Size (mm)</i>	<i>Designation</i>	<i>Size (mm)</i>
A0	1189 × 841	A3	420 × 297
A1	841 × 594	A4	297 × 210
A2	594 × 420	A5	210 × 148

Drawing Pencil

- The accuracy and appearance of a Drawing depends on the quality of Pencil used to make Drawing
- The grade of a Pencil lead is marked on the Pencil. HB denotes medium grade
- Increase in hardness is shown by value put in front of H such as 2H, 3H etc., Softer pencils are marked as 2B, 3B, and 4B etc
- A Pencil marked 3B is softer than 2B and Pencil marked 4B is softer than 3B and so on
- Beginning of a Drawing may be made with H or 2H
- For lettering and dimensioning, H and HB Pencils are used

Drawing Pins and Clips

- These are used to fix the Drawing sheet on the Drawing board



Compass

- Compass is used for drawing circles and arcs of circles. The compass has two legs hinged at one end. One of the legs has a pointed needle fitted at the lower end where as the other end has provision for inserting pencil lead
- Circles up to 120 mm diameters are drawn by keeping the legs of compass straight. For drawing circles more than 150 mm radius, a lengthening bar is used

