



CE 181103

**1st Semester
Civil & Chemical
Engg.**

Engineering Graphics and Design

M-1: Introduction

Prepared By,
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Engineering Graphics & Design / Engineering Drawing:

↳ Basic subject for Civil Engineering branch.

* Drawing: → Diagram / Pictorial representation of any real thing or idea.
↳ Shape or how the object/idea looks like.

⊛ Engineering Drawing: Drawings, which have some engineering importance.

→ These are also called technical drawings that conveys information about an object.

↳ Shape (2D/3D)

→ Size (proper) → (Dimensions → length / width / height / radius)

→ Scale:

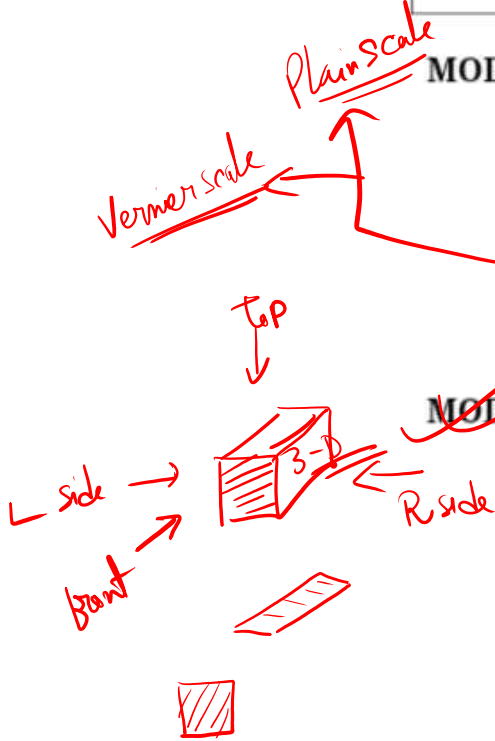
Course Code	Course Title	Hours per week L-T-P	Credit C
CE181103	Engineering Graphics and Design	1-0-4	3

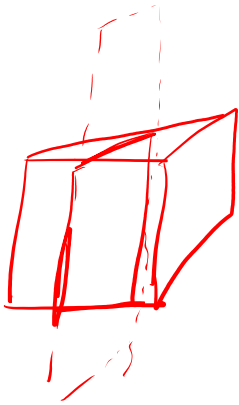
MODULE 1: Introduction to Engineering Drawing (8 Lectures)

- i. Principles of Engineering Graphics and their significance, usage of Drawing instruments: Pencil/scale/compass/etc.
- ii. Lettering: Single stroke letter – Vertical and inclined capital and small letter, → A, B, C, D
- iii. Scales: Plain scale and vernier scale. → 0-9
- iv. Curves: Conic sections – Ellipse, parabola, hyperbola, different methods of construction of conic sections, tangents and normal to conics. → eccentricity

MODULE 2: Orthographic Projections (14 Lectures)

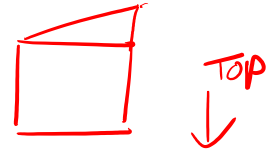
- i. Principles of Orthographic Projections- Conventions ✓
- ii. Projection of points : Introduction of projection, quadrants, 1st, 2nd, 3rd and 4th angle projection of points. ✓
- iii. Projection of lines (First angle only) : Line parallel to one or both planes, line perpendicular to a plane, line inclined to one plane and parallel to other, line inclined to both plane. ✓
- iv. Projections of planes (First angle only): Plane perpendicular to one plane and parallel to other, plane perpendicular to both plane, plane inclined to one plane and perpendicular to other. ✓
- v. Projection of solids (First angle only) : Axis perpendicular to one plane and parallel to other, axis parallel to both plane, axis inclined to one plane and parallel to other, axis inclined to both plane. ✓





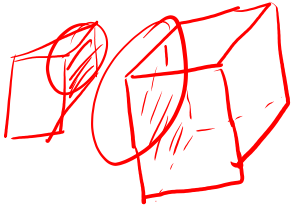
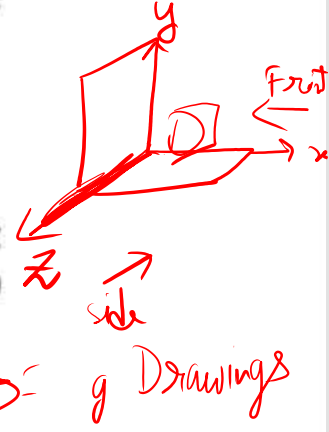
MODULE 3: Sections and Sectional Views of Right Angular Solids (4 Lectures)

Section of solids: Section plane parallel to one plane and perpendicular to other, section plane inclined to one plane and perpendicular to other.



MODULE 4: Isometric Projections (4 Lectures)

Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions.



MODULE 5: Introduction of Computer Graphics (6 Lectures)

✓ AutoCAD →

Demonstrating knowledge of the theory of CAD software such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.; applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines

g Drawings

**MODULE 6: Demonstration of simple team design (Students Project as group work)
(4 Lectures)**

Auto-CAD
→

Creation of engineering models and their presentation in standard 2D blueprint form, 3D wire-frame and shaded solids; meshed topologies for engineering analysis. Drawing of floor plans, front elevation and sectional elevation showing floor level to ceiling of a simple two storied building with doors and windows.

NOTE:

1. **Assessment of student based on above syllabus comprises of three parts**
 - a. Theory examination covering Module 1 to Module 4
 - b. Practical Examination covering Module 5
 - c. Project covering Module 6

→ Google d

Text/Reference Books:

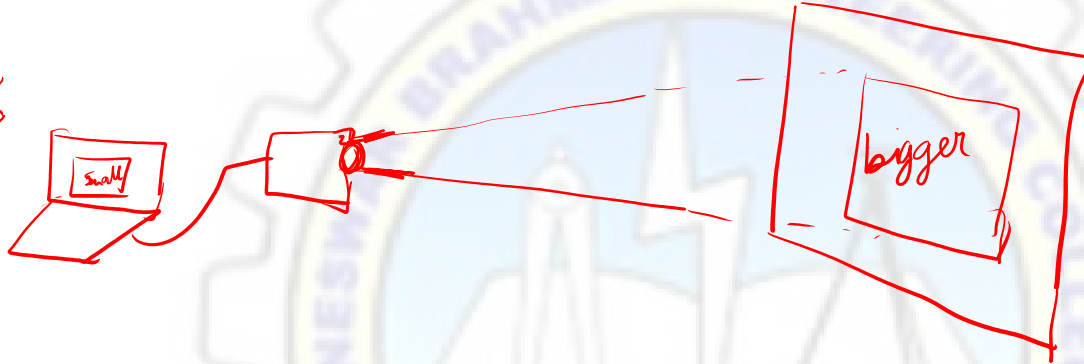
1. Bhat, N.D.& M. Panchal (2008), Engineering Drawing, Charotar Publishing House
2. Shah, M.B. & B.C. Rana (2008), Engineering Drawing and Computer Graphics, Pearson Education
3. Dhawan, R.K. (2007), A Text Book of Engineering Drawing, S. Chand Publications
4. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers.
5. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
6. User manual of CAD software.

Projection:

(views)

How the object will look like from any side.

Projectors:



Assignments:

→ Google classroom (Test)

Classes

→ Google meet

→ Why T.D. is necessary?

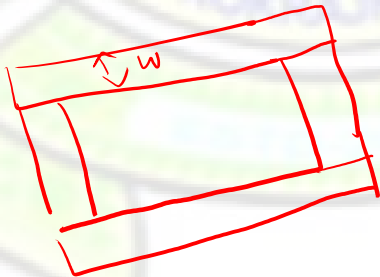
⊛ Engineering Drawings is called the "language of Engineers" ⊛
↳ checking (Passed) (Guide)

Civil Engg. → Asst. Engg. / Jr. Engg. / Design Engg. / Site engg. (Site engg.)

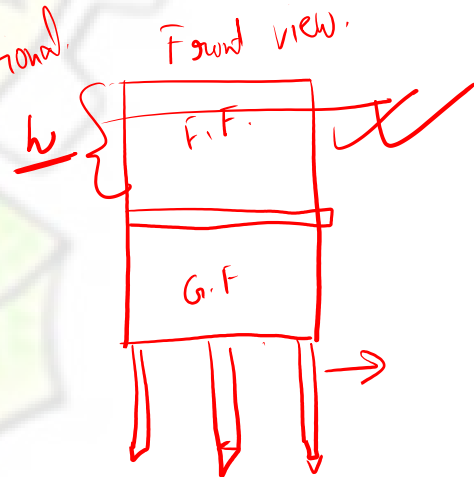
Junior Engg. → Preparing detailed plan
↳ Project expenditure (budget) (construction materials)

⊛ Put his idea as a form of drawing.

Reinforcement used }
Cement used }

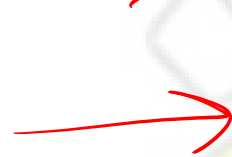


Top view / section





Purpose of E/D



Proper documentation of any idea
to communicate (transferring idea).

Features of E.D:

→ (i) Geometry → Shape

(ii) Dimensions → Size

(iii) Scale → ~~Ratio used~~ Ratio used for reducing.

(iv) Tolerance → Maxim allowable error.

Drawing instruments:

Light / Dark

(i) Pencil

2H/4H/

2B/4B/6B

H / B / HB

(ii) Scale

Plain scale →

Linear measurement / to make straight lines.

(iii) Protractor

(iv) Compass

(v) Set-square

(vi) T-square / T-scale

(vii) Drafter / Drafting instrument

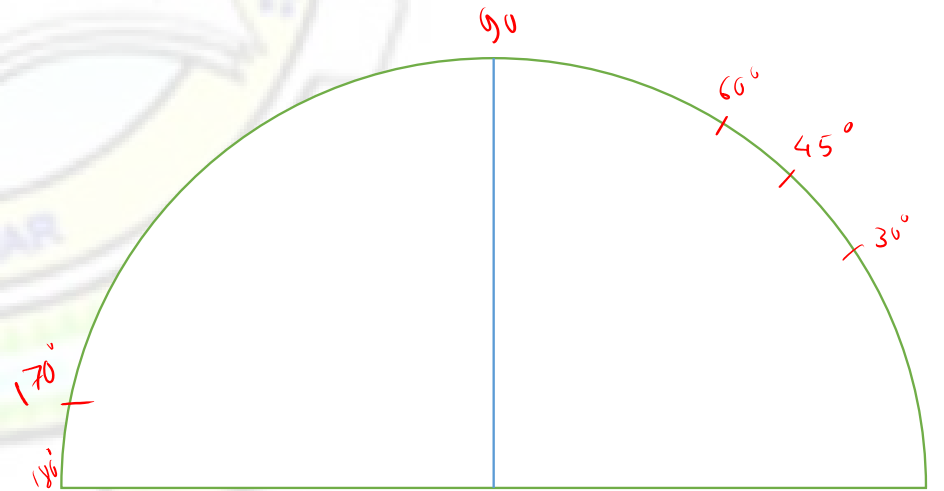
(viii) Clip/pins.

→ Drawing inclined line over any point on another line with great accuracy.

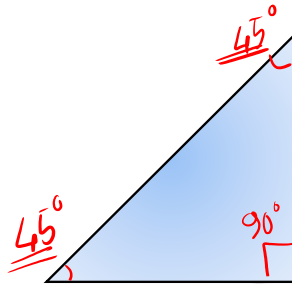
→ Angle measurement

Compass: → To make circles of any radius

→ To bisect a line

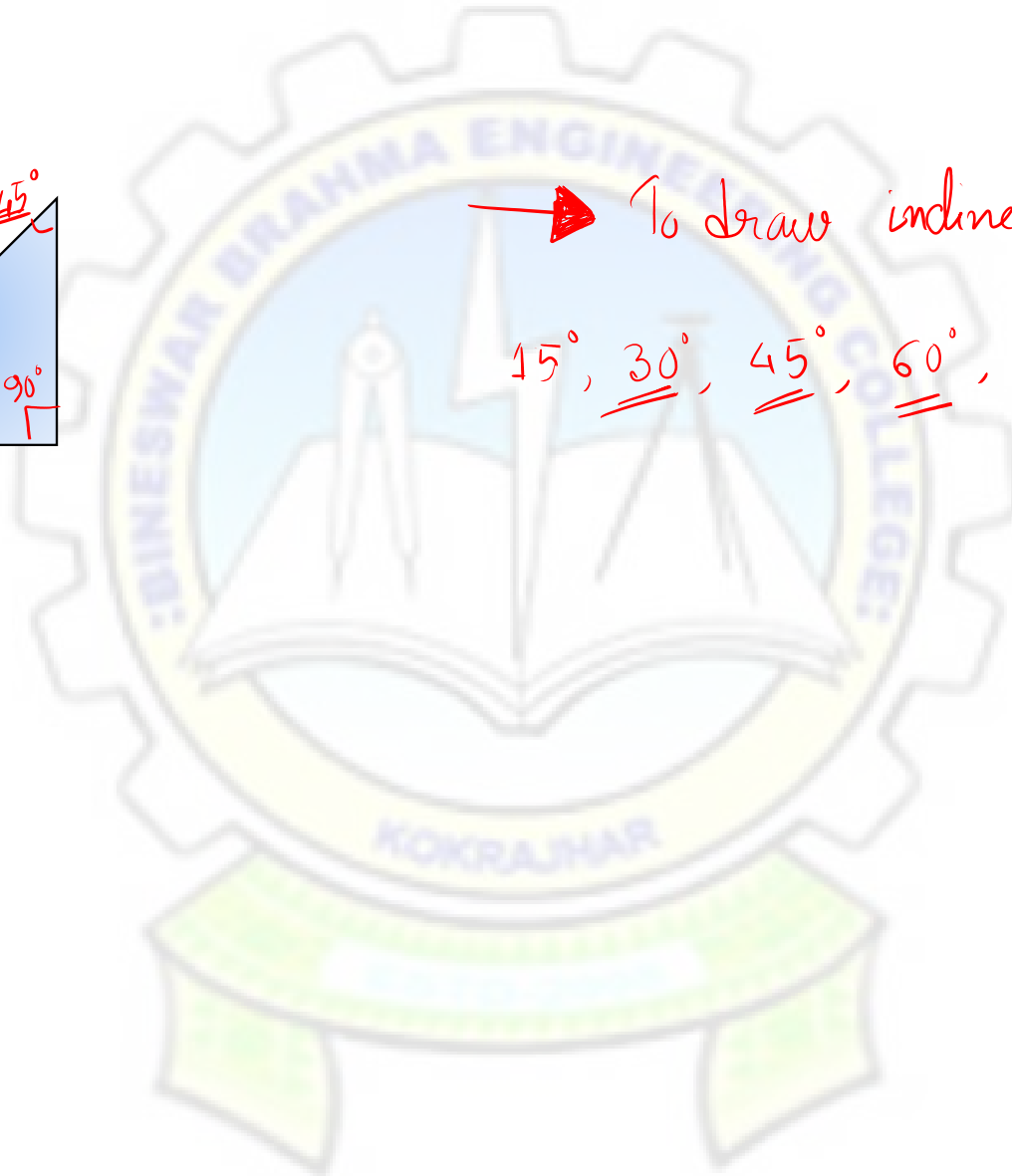
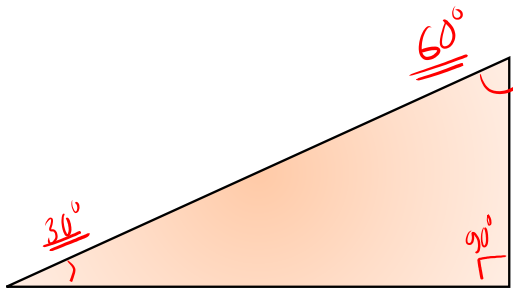


Set squares

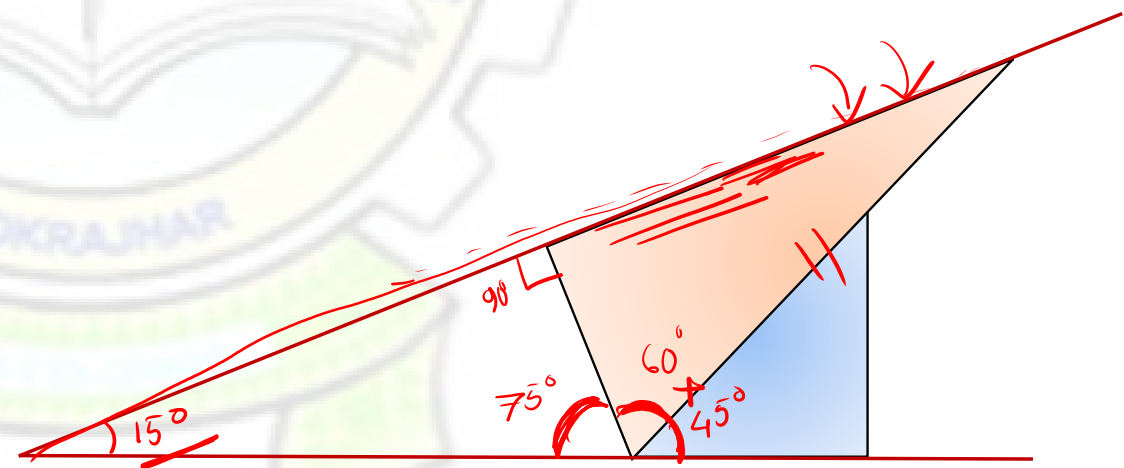
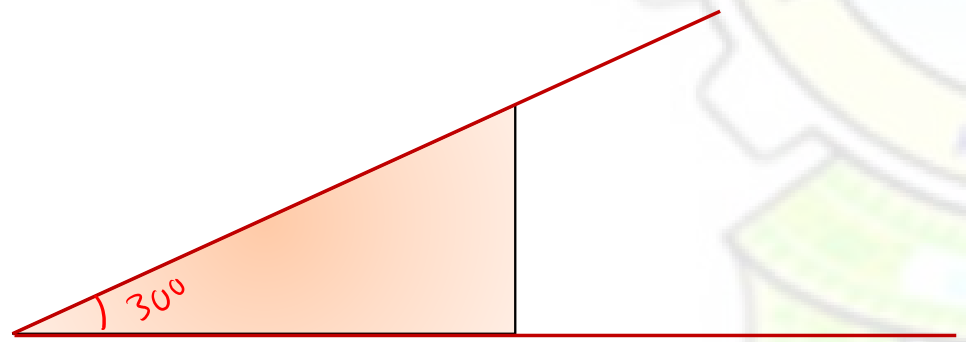
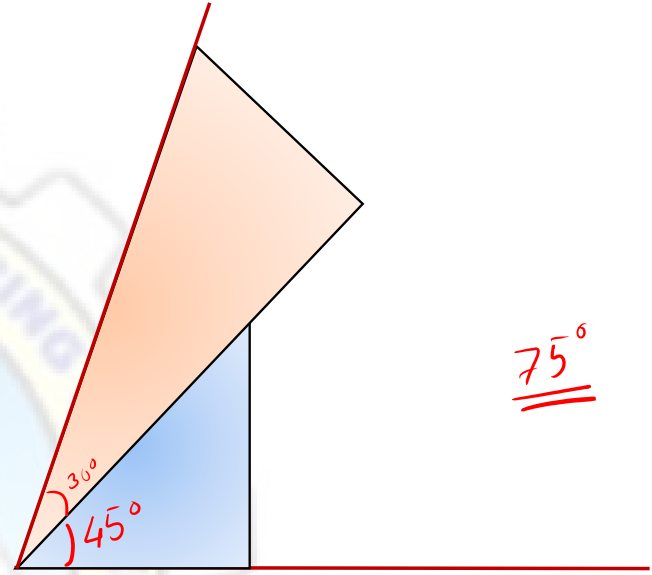
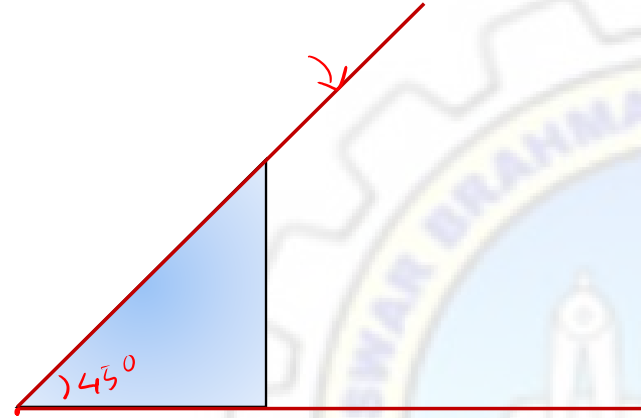


→ To draw inclined lines at angles

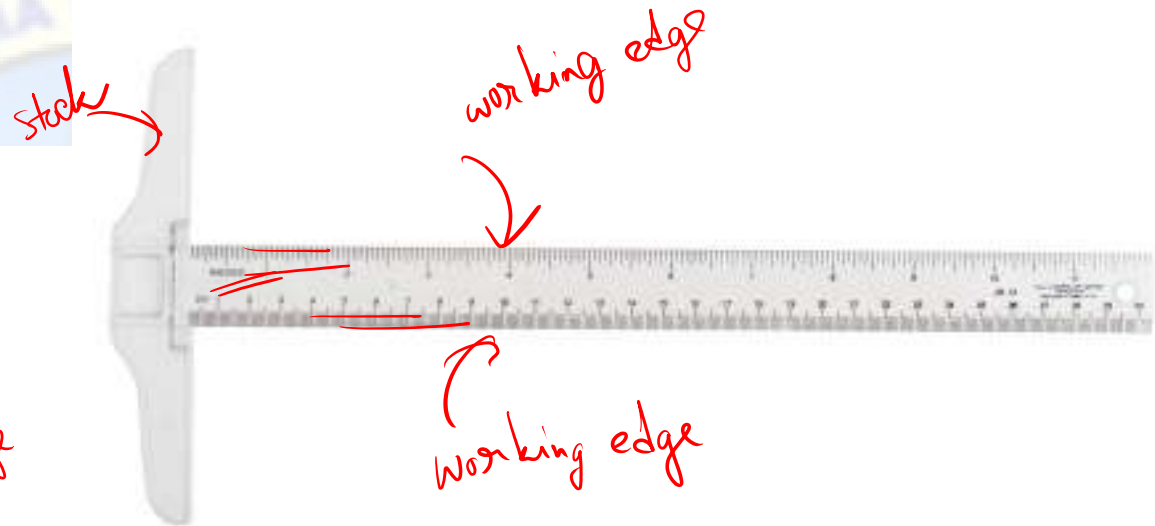
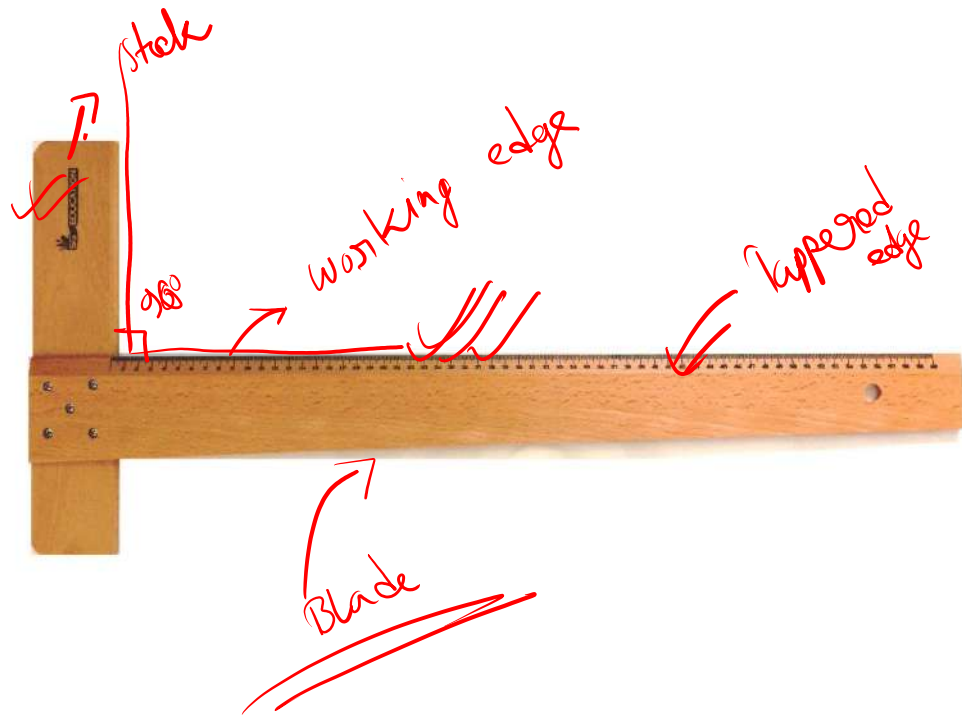
45° , 30° , 45° , 60° , 75° , 90° , 105° , 120°



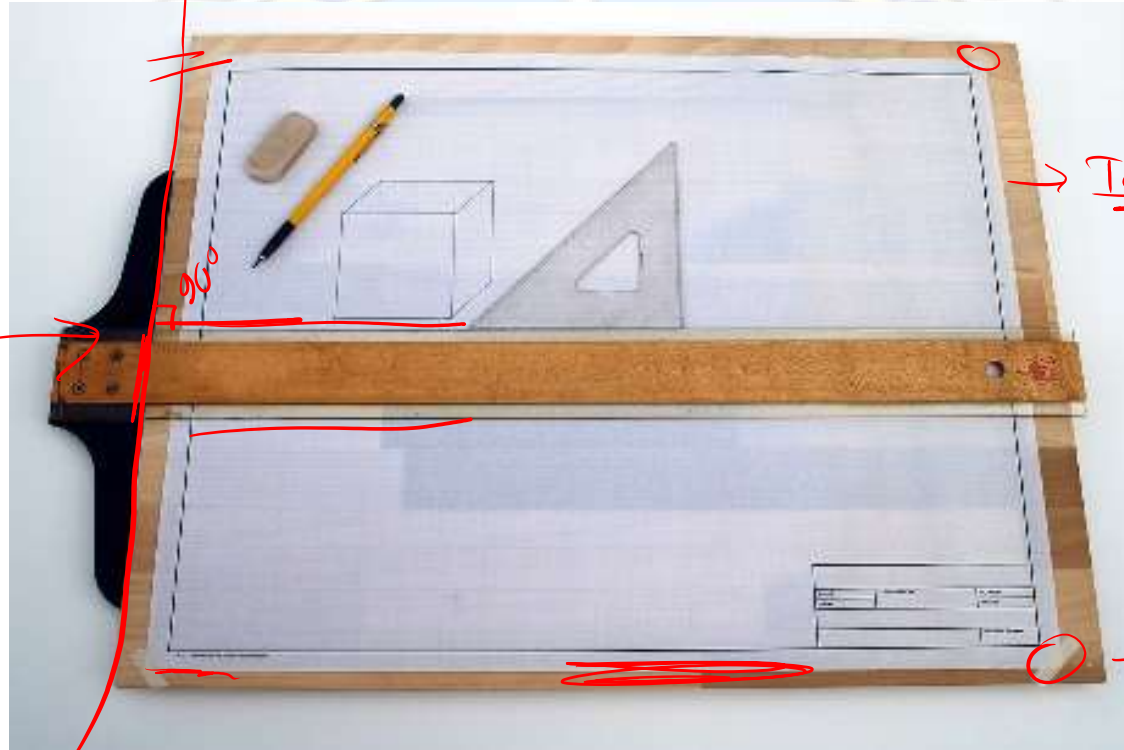
Set squares



T-square / T scale → Linear measurement
→ Horizontal & vertical lines.

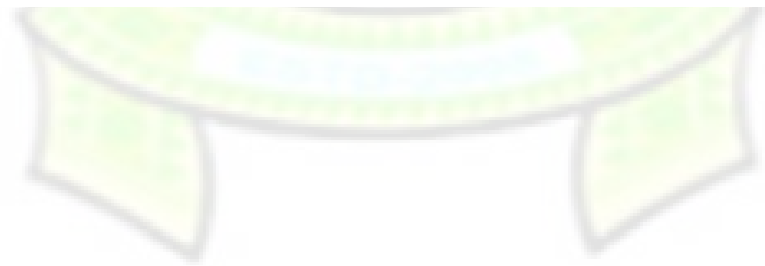
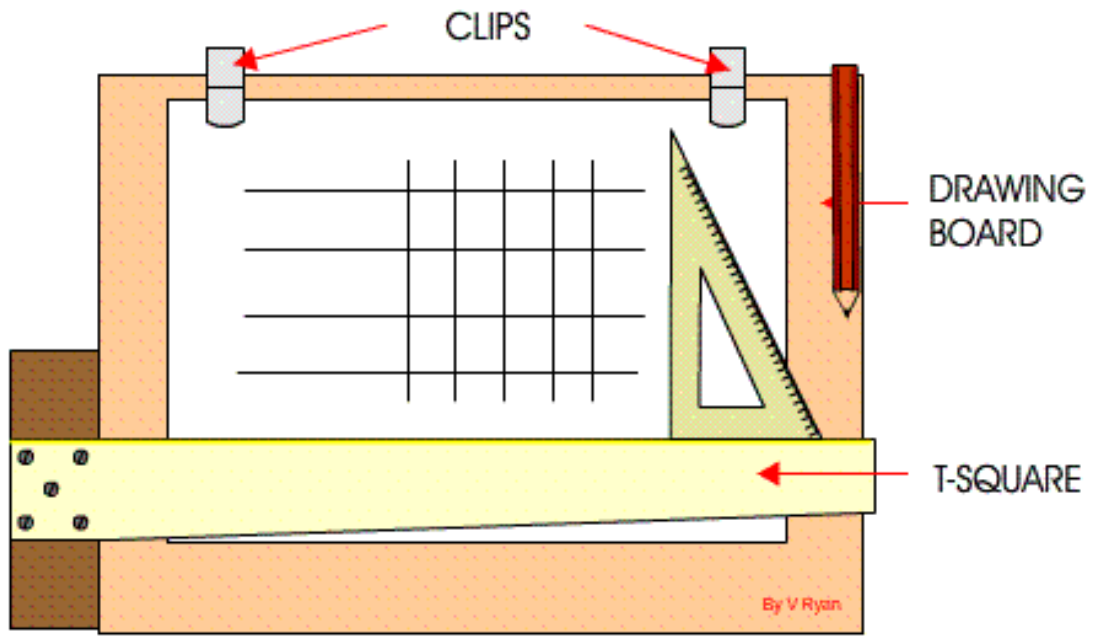


Pins/clips →



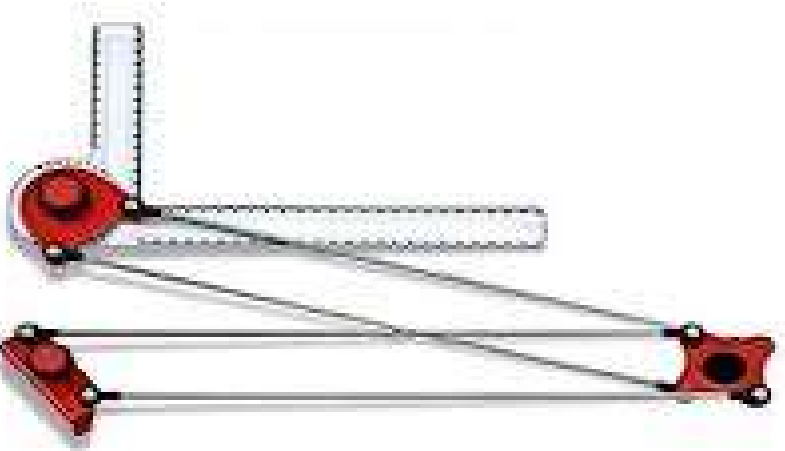
→ Table

○ Tapes

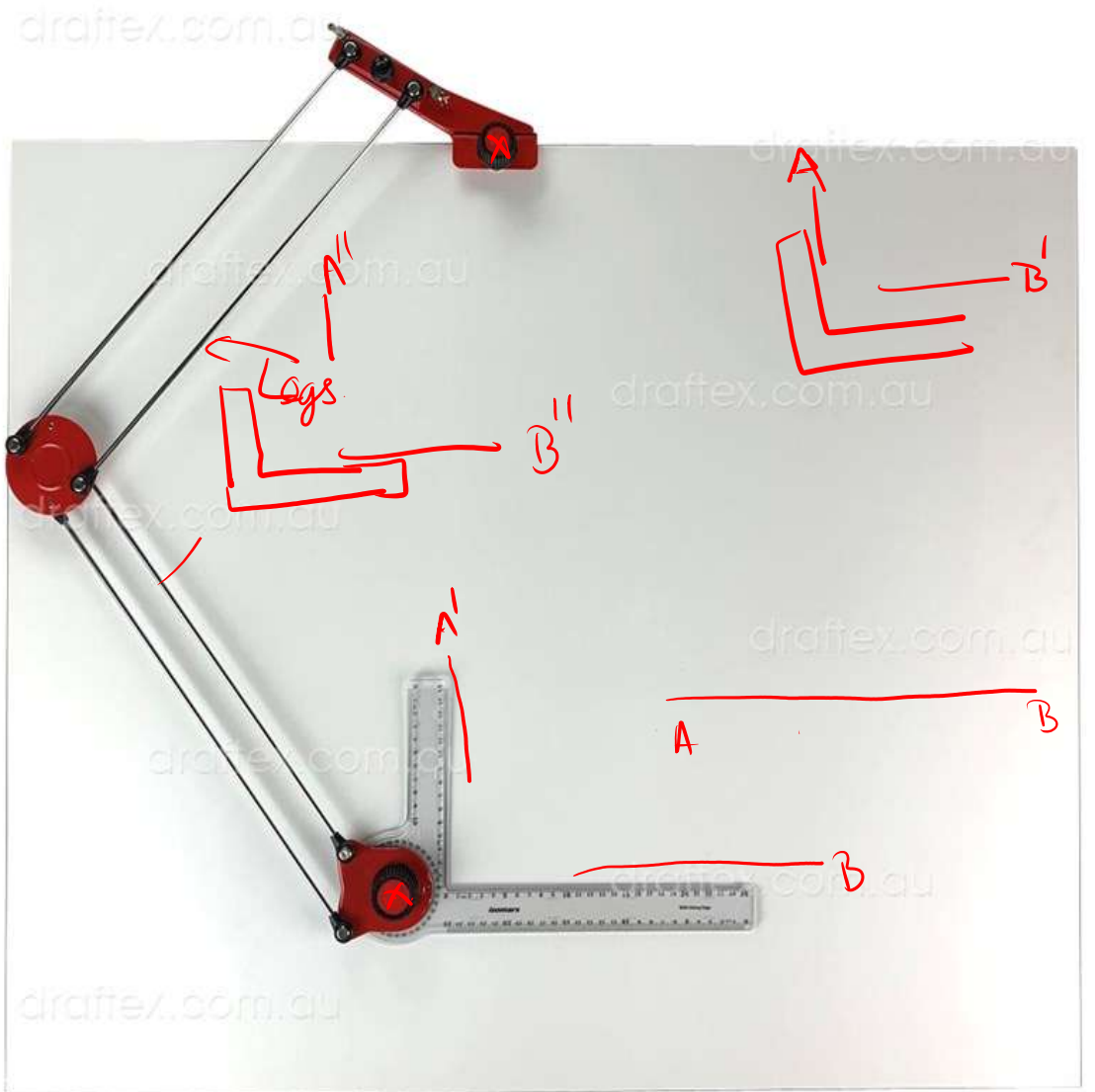


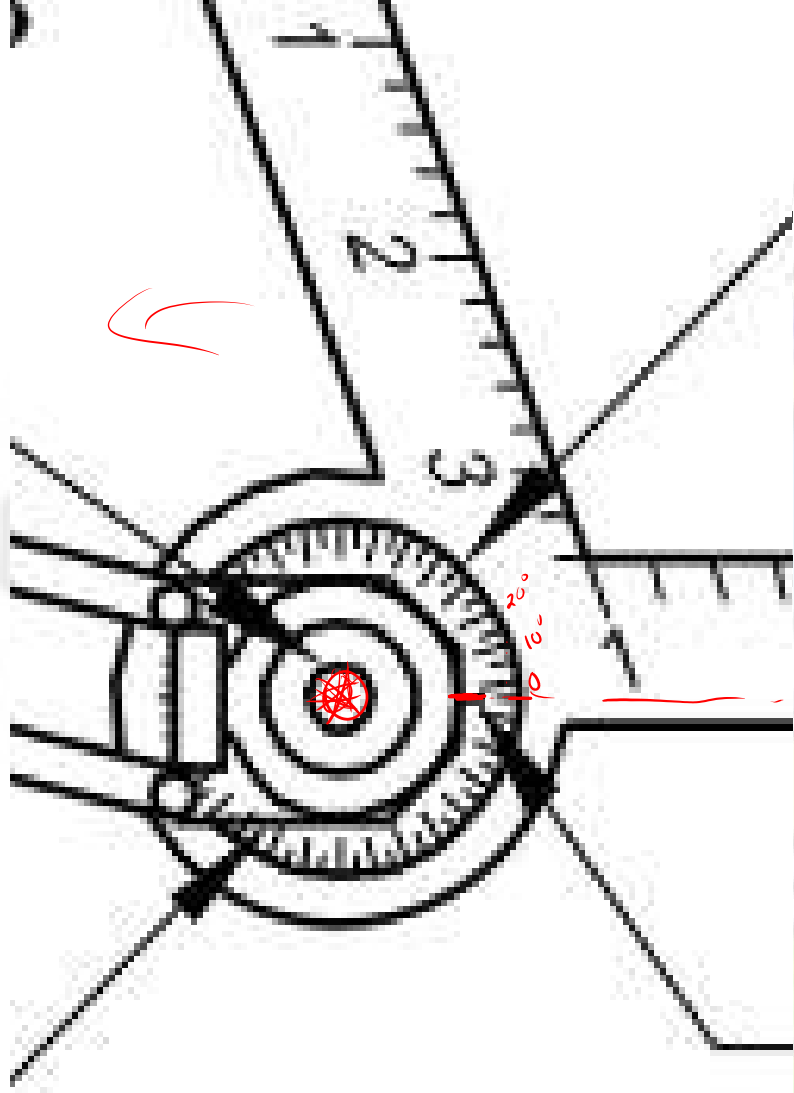
Drafter / Drafting machine

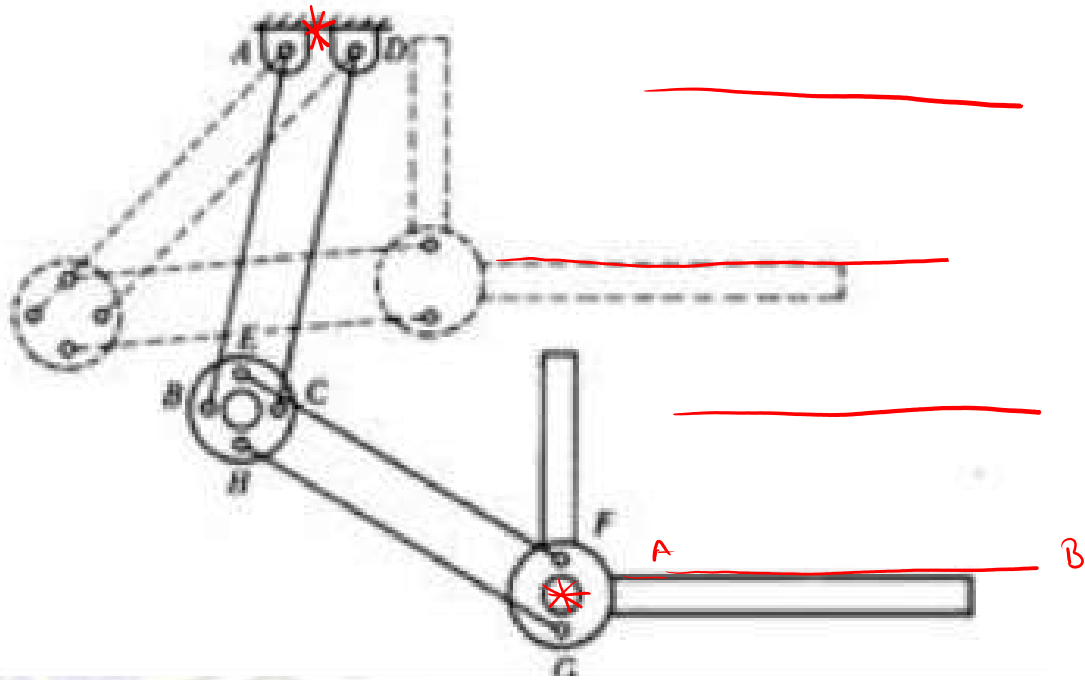
- To draw parallel lines to any line
- To draw inclined lines



* After clamping both the clamps always get parallel lines



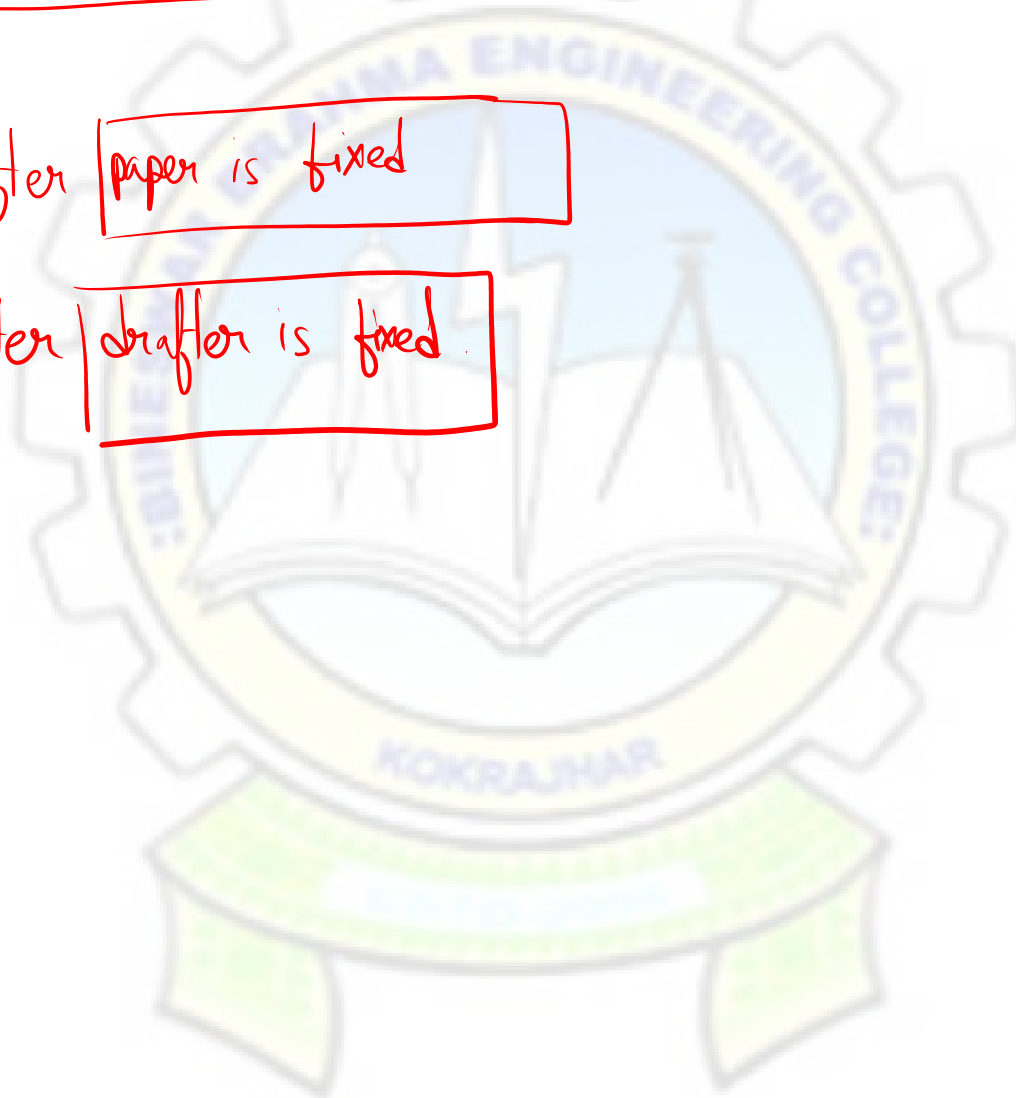


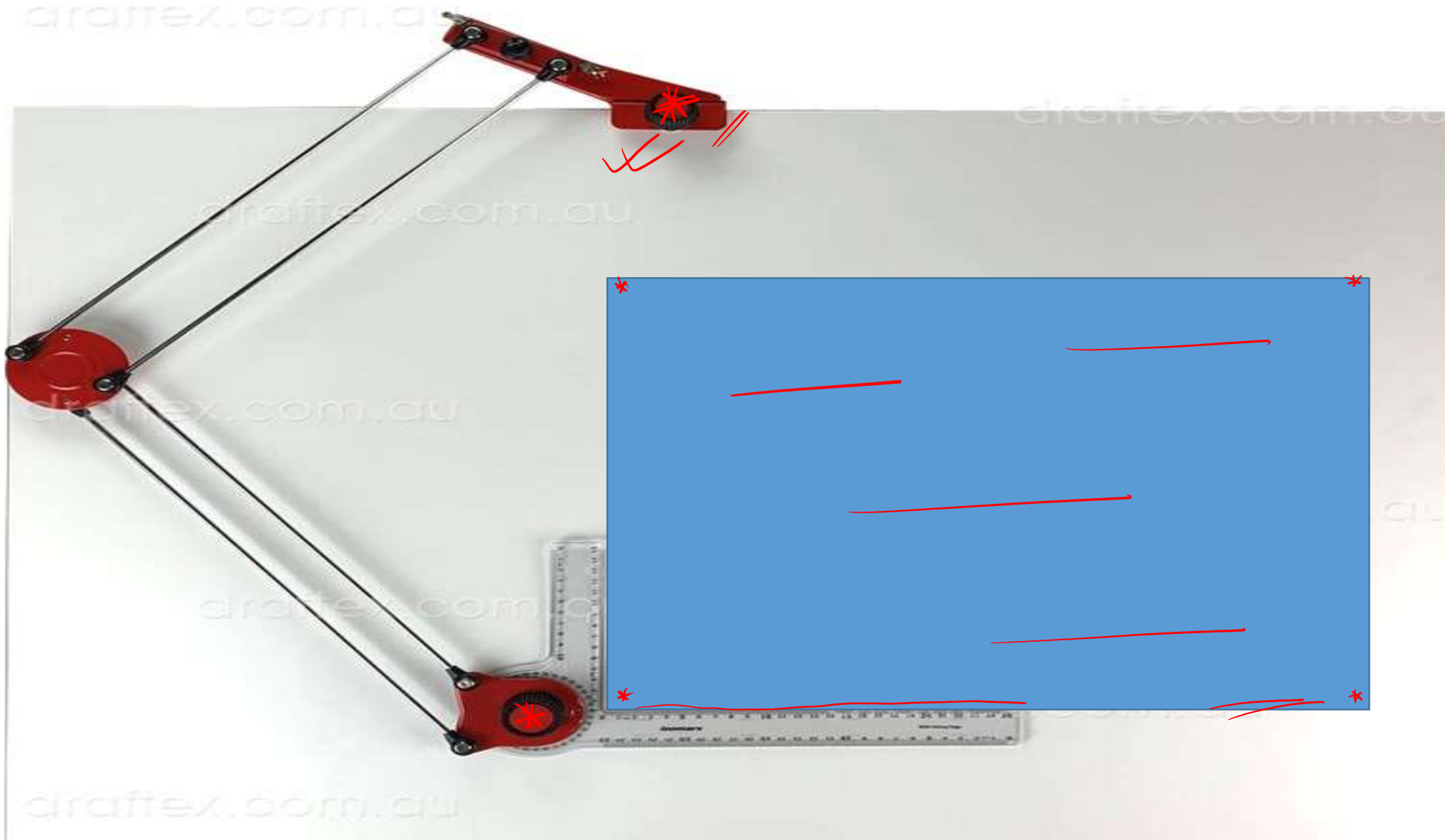


* Orienting your drawing paper with drafter

(1) Orienting drafter after paper is fixed

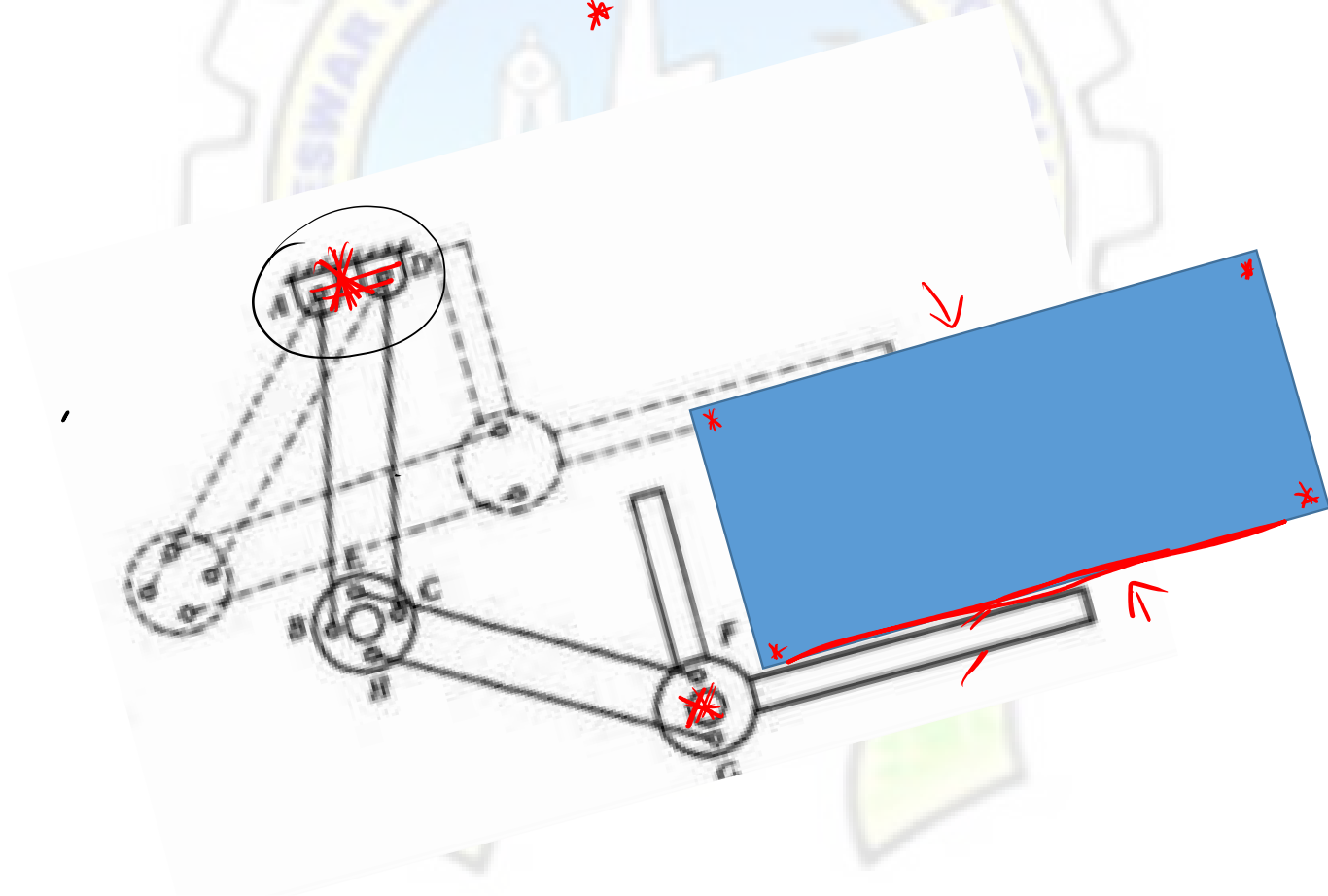
(ii) Orienting paper after drafter is fixed



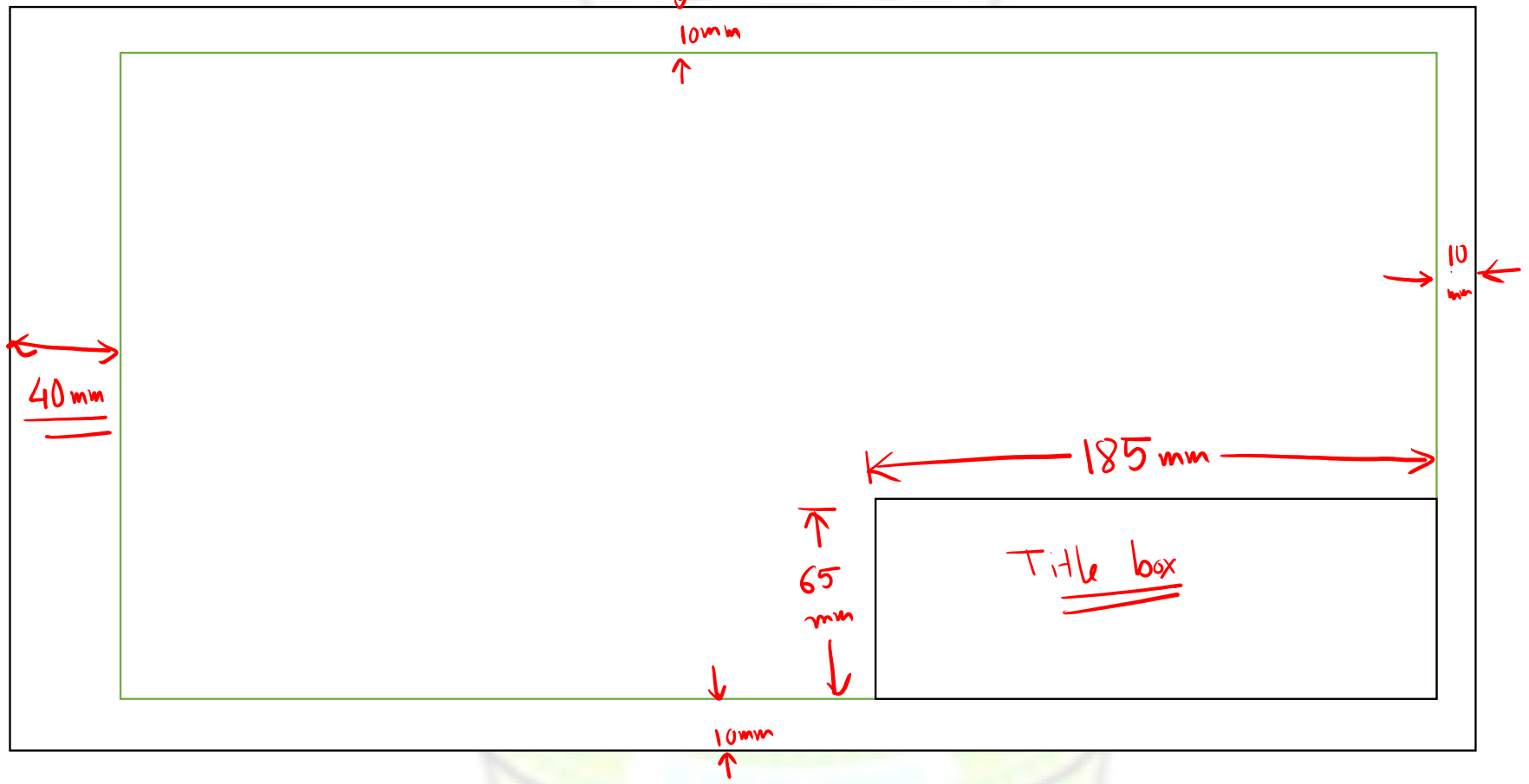


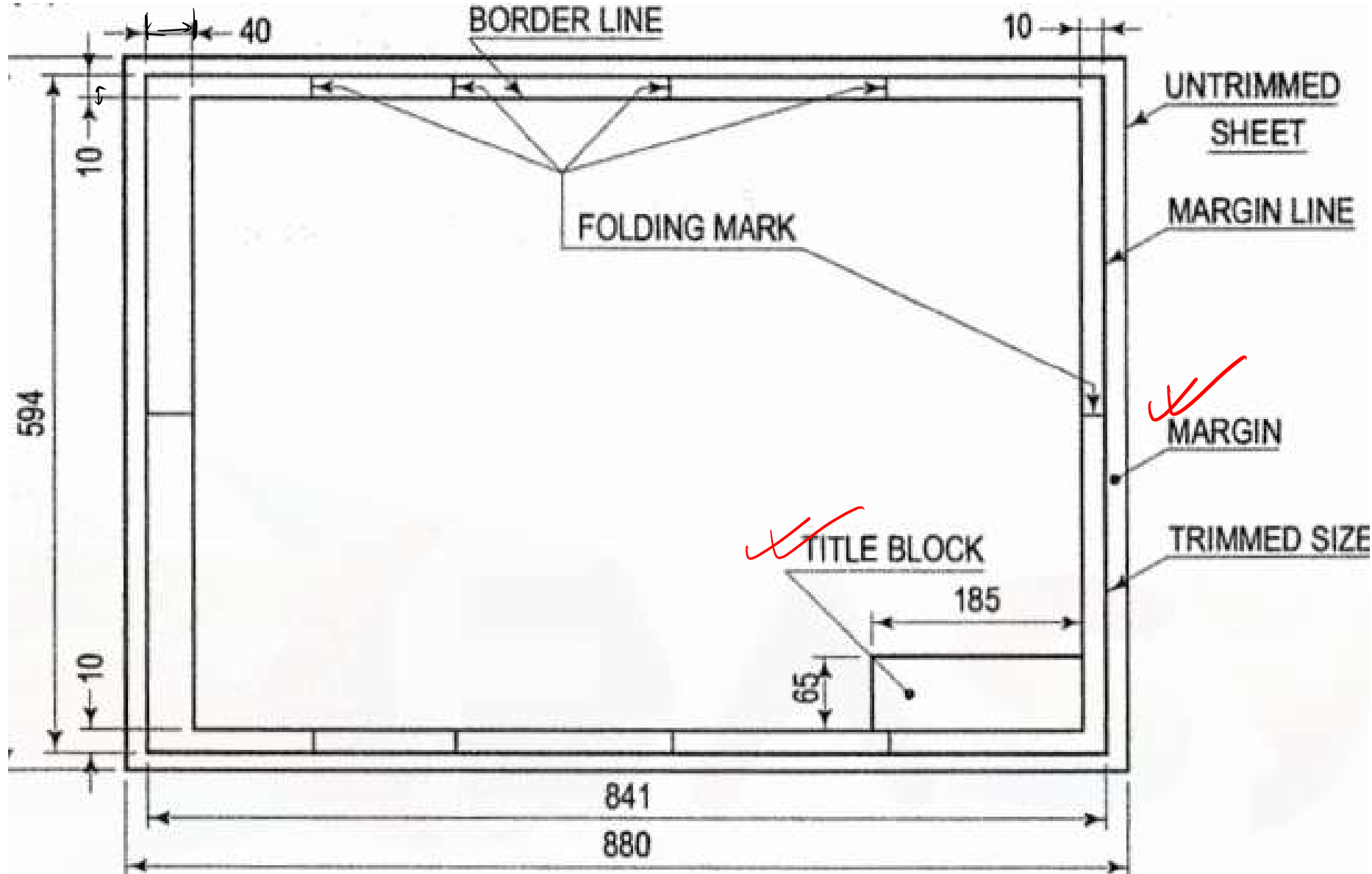
① Orient drafter w. r to paper

→ Clamp the drafter to table

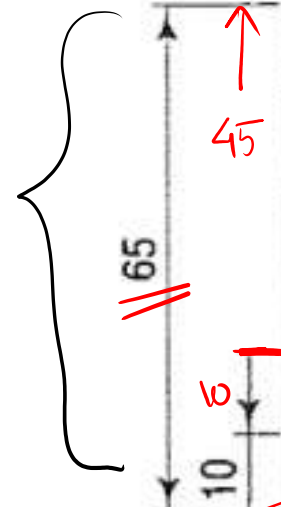


Paper →





Name of college/ Branch



NAME OF THE FIRM

1:20 1:50

SCALE TITLE



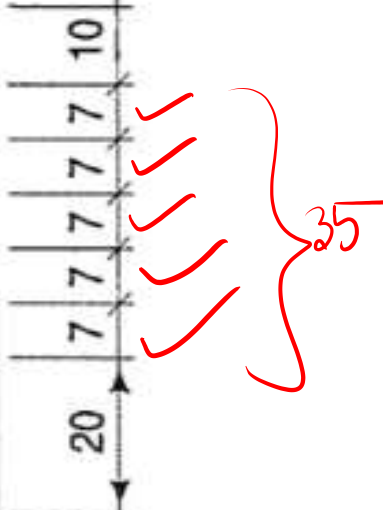
Const. Scale

55 mm
20 mm 25 10

	NAME	DATE
DESIGNED		
DRAWN		
CHECKED		
STANDARD		
APPROVED		

DRAWING NO.











SHEET 3 OF 12

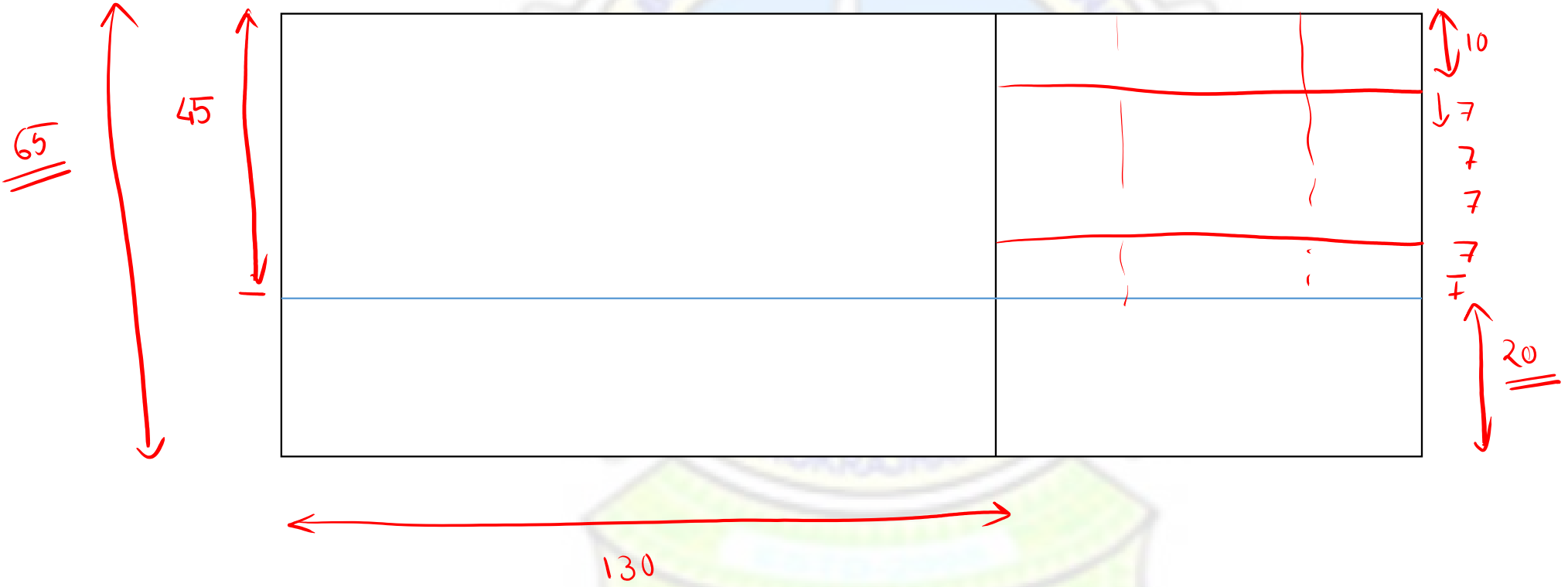


Symbol of projection

185
130 mm

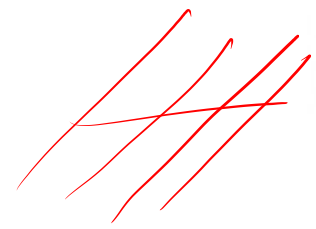
55

Line	Description	General applications
A 	Continuous thick or Continuous wide	Visible outlines, visible edges; crests of screw threads; limits of length of full depth thread; lines of cuts and section arrows; parting lines of moulds in views; main representations in diagrams, maps, flow charts; system lines (structural metal eng.)
B 	Continuous thin (narrow) (straight or curved)	Imaginary lines of intersection; grid, dimension, extension, projection, short centre, leader, reference lines; hatching; outlines of revolved sections; root of screw threads; interpretation lines of tapered features; framing of details; indication of repetitive details;
C 	Continuous thin (narrow) (freehand)	Limits of partial or interrupted views and sections, if the limit is not a chain thin line.
D 	Continuous thin (narrow) with zigzags (straight)	Long-break line
E 	Dashed thick (wide)	Line showing permissible of surface treatment
F 	Dashed thin (narrow)	Hidden outlines; hidden edges
G 	Chain thin Long-dashed dotted (narrow)	Centre line; lines of symmetry; trajectories; pitch circle of gears, pitch circle of holes,
H  THICK THIN THICK	Chain thin (narrow) with thick (wide) at the ends and at changing of position.	Cutting planes
I 	Chain thick or Long-dashed dotted (wide)	Indication of lines or surfaces to which a special requirement applies.
K 	Chain thin double-dashed or long-dashed double-dotted (narrow)	Outlines of adjacent parts Alternative and extreme positions of movable parts Centroidal lines Initial outlines prior to forming Parts situated in front of the cutting plane



~~*~~ Drawing Book :

*



T-scale

*

H / B - pencil

~~*~~ ~~Drafter~~

2 clips →

Exam
class / offline



Thank You!

