CE 181103

1st Semester
Civil & Chemical Engg.

M-2: Projection of Line
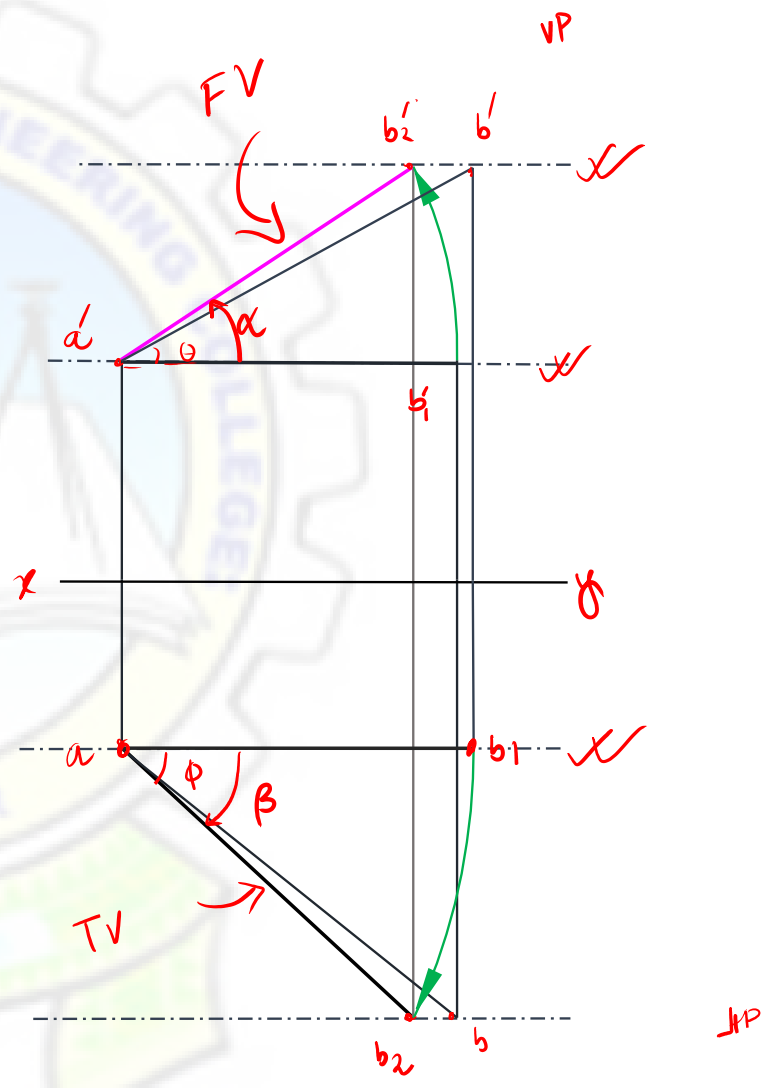
(iv) Inclined to both planes

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$\theta \rightarrow$ Angle with HP (made by the TL)

$\phi \rightarrow$ Angle with VP (TL)

$\alpha \rightarrow$ HP by (FVL)

$\beta \rightarrow$ VP (TVL)

TL, FVL, TVL

$$ab_1 = ab_2$$
$$ab_1' = ab_2'$$

FV

VP

b_2' b_1'

a' α θ

b_1'

x y

a ϕ β b_1

TV

b_2 b

HP

Q.1 A straight line 55 mm long makes an angle of 30° to the HP and 45° to VP. The end A is 15 mm above HP and 12 mm in-front of VP. Draw its projection. $[TVL, FVL, \alpha, \beta]$

Sol^n

$AB = 55$ mm

$a'b' = 55$ mm

$ab = 55$ mm

$\theta = 30°$

$\phi = 45°$

$\begin{cases} ab_2 \rightarrow \text{final top view} \\ ab'_2 \rightarrow \text{final front view} \end{cases}$
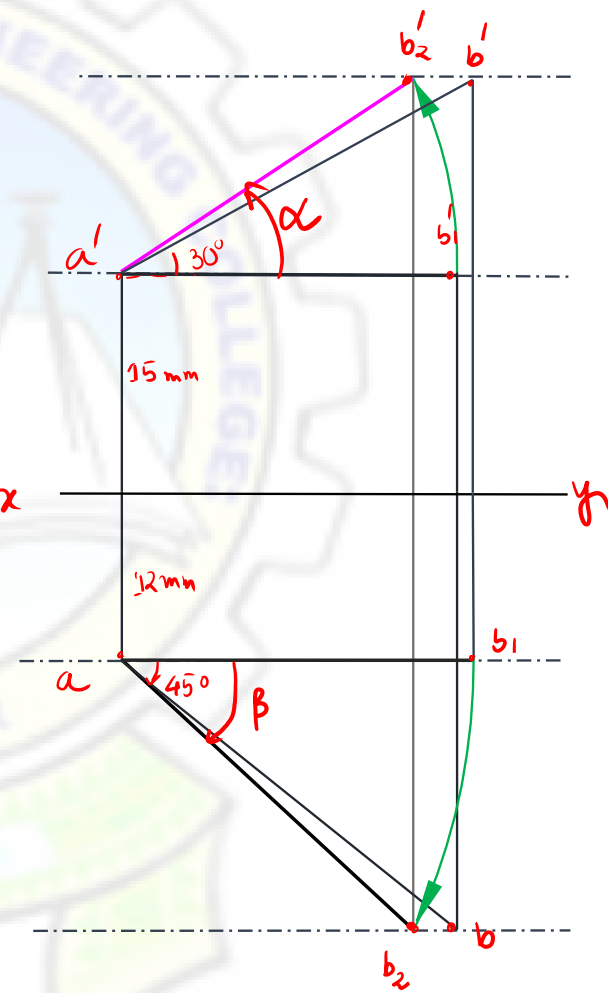
$h_A = 15$ mm

$d_A = 12$ mm

Q.2 A straight line AB 90mm long is inclined at 30° to the HP. The end A is 12 mm above HP and 20 mm in-front of VP. Its front view measures 65 mm. Draw the top view of AB and find its inclination to VP.

Soln

Proc!

$AB = 90\,mm$

$\theta = 30°$

$h_A = 12\,mm$

$d_A = 20\,mm$

$F.V.L. = 65\,mm = a'b_2'$

$TVL = ?$

$\phi = ?$

$a'b' = 90\,mm$

$TV = ab_2 = $ Final top view

$ab_1 = 90\,m = AB$

VP

b_2' b'

a' 30°

12mm

x   y

20mm

a ϕ b

b_2 b_1 ↳ Locus of b in Top view

Q.2 A straight line AB 90mm long is inclined at 30° to the HP. The end A is 12 mm above HP and 20 mm in-front of VP. Its front view measures 65 mm. Draw the top view of AB and find its inclination to VP.

Proc 2

Soln

$AB = 90 mm$

$\theta = 30°$

$h_A = 12 mm$

$d_A = 20 mm$

← F.V.L. = 65 mm $= a'b'_2$

TVL = ? =

$\phi = ?$

$a'b' = 90 mm$

TV = ab_2 = Final top view

$ab_1 = 90 mm$

VP

b'_2 b'

a' 30°

12mm

x ————————————— y

20mm

a   b

ϕ

b_2 b_1 → Locus of b in Top view
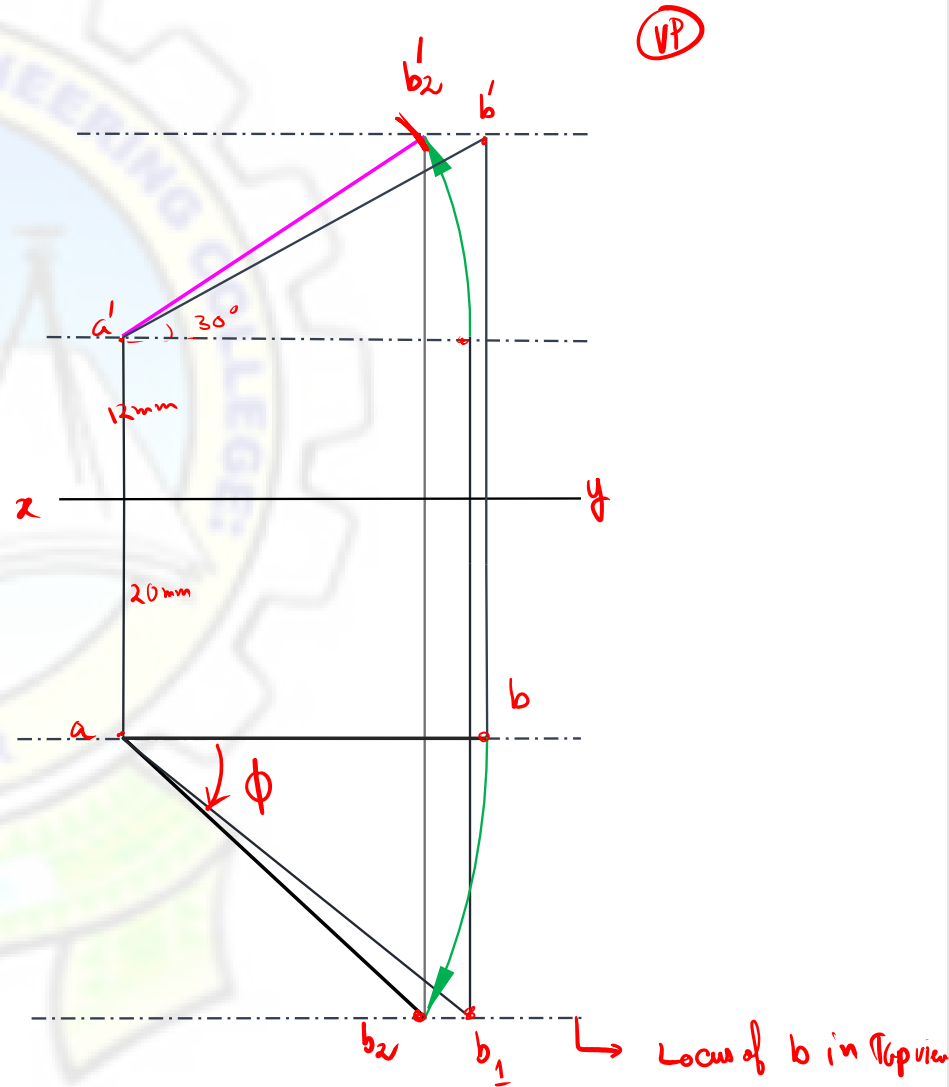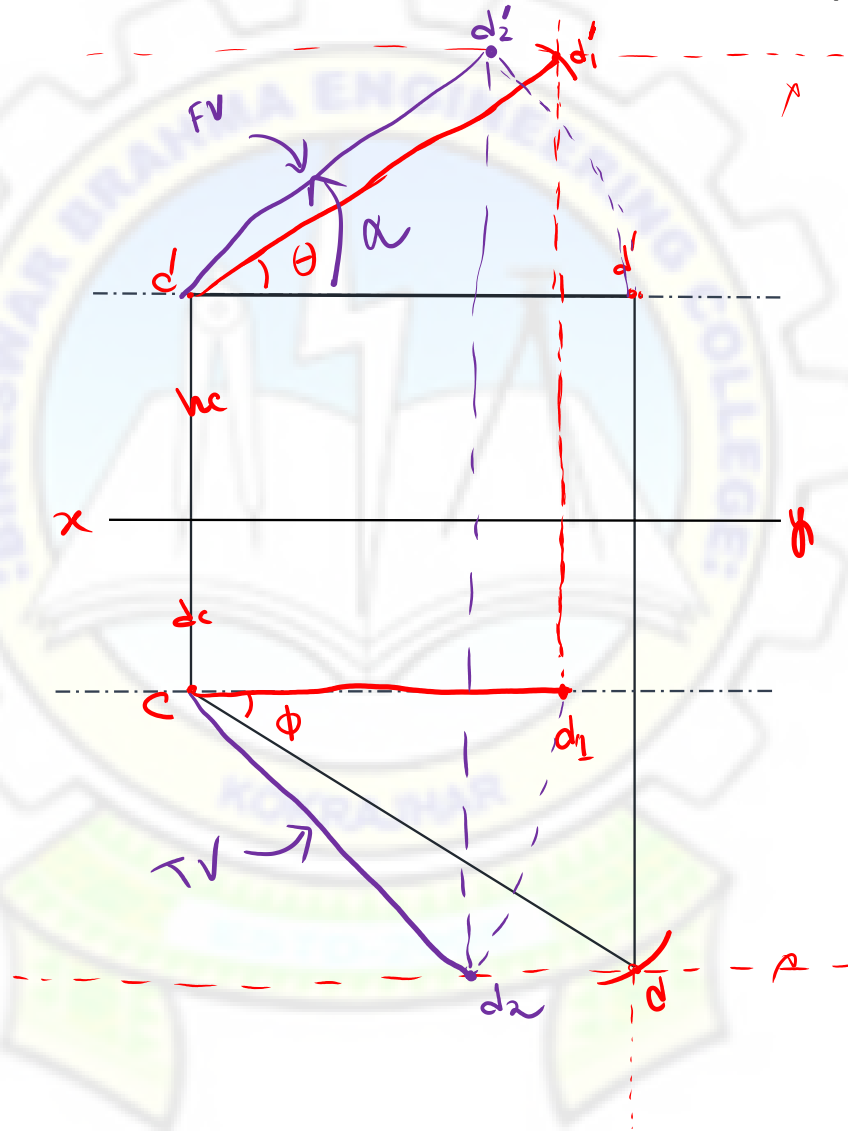
Q.3 A straight line CD 90mm long measures 72 mm in front view and 65 mm in the top view. Draw the two views of the line if it fully lies in the first quadrant. Find the inclinations of the line. Assume point C is 25 mm above HP and 20 mm in-front of VP.

<u>Sol^n</u>

$CD = 90 \text{ mm } (TL)$

$FVL = 72 \text{ mm}$

$TVL = 65 \text{ mm}$

$\theta = ?$

$\phi = ?$

$hc = 25 \text{ mm}$

$dc = 20 \text{ mm}$

$c'd' = 72 \text{ mm}$

$Cd = 90 \text{ mm}$

$cd_1 = 65 \text{ mm}$

$c'd'_1 = 90 \text{ mm}$