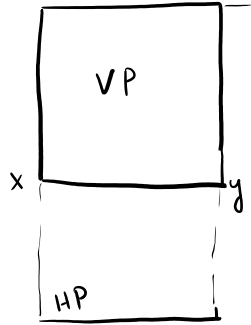# CE 181103

1st Semester Civil & Chemical Engg.

Engineering Graphics and Design

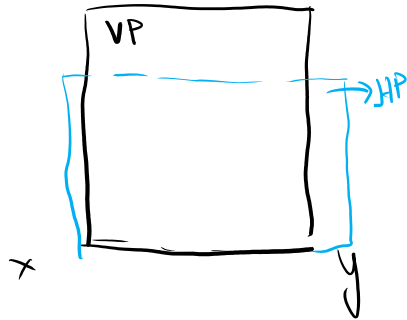## M-2: Projection of Points

Prepared By,

ARINDOM DAS

Assistant Professor
Dept. of Civil Engineering
(Bineswar Brahma Engineering College)

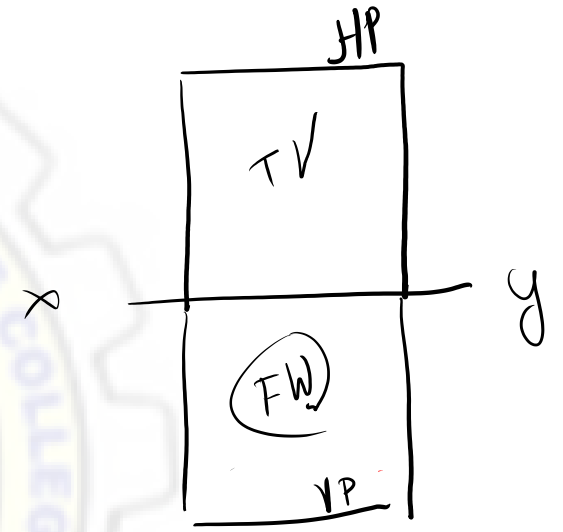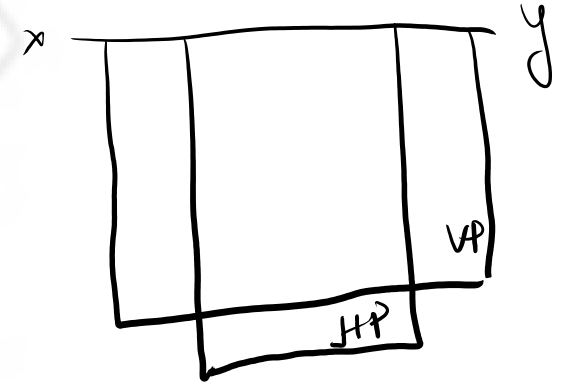# Layouts of 1st/2nd/3rd/4th angle projection

1st

VP

x ———— y

HP

2nd

VP

→ HP

x ———— y

3rd

HP

TV

x ———————— y

(FW)

VP

4th

x ———————— y

VP

HP

Projection of point:

[Front view (VP) & Top view (HP)]

→ 1st angle

→ 2nd angle

→ 3rd

→ 4th angle

$\begin{cases} d \to \text{dist. from V.P.} \\ h \to \text{heigh from HP} \end{cases}$

VP

1st

HP
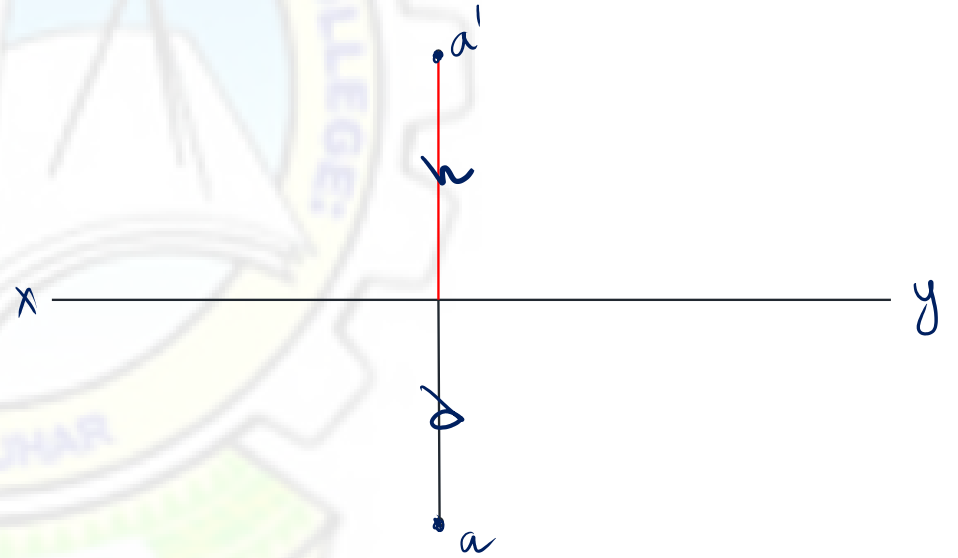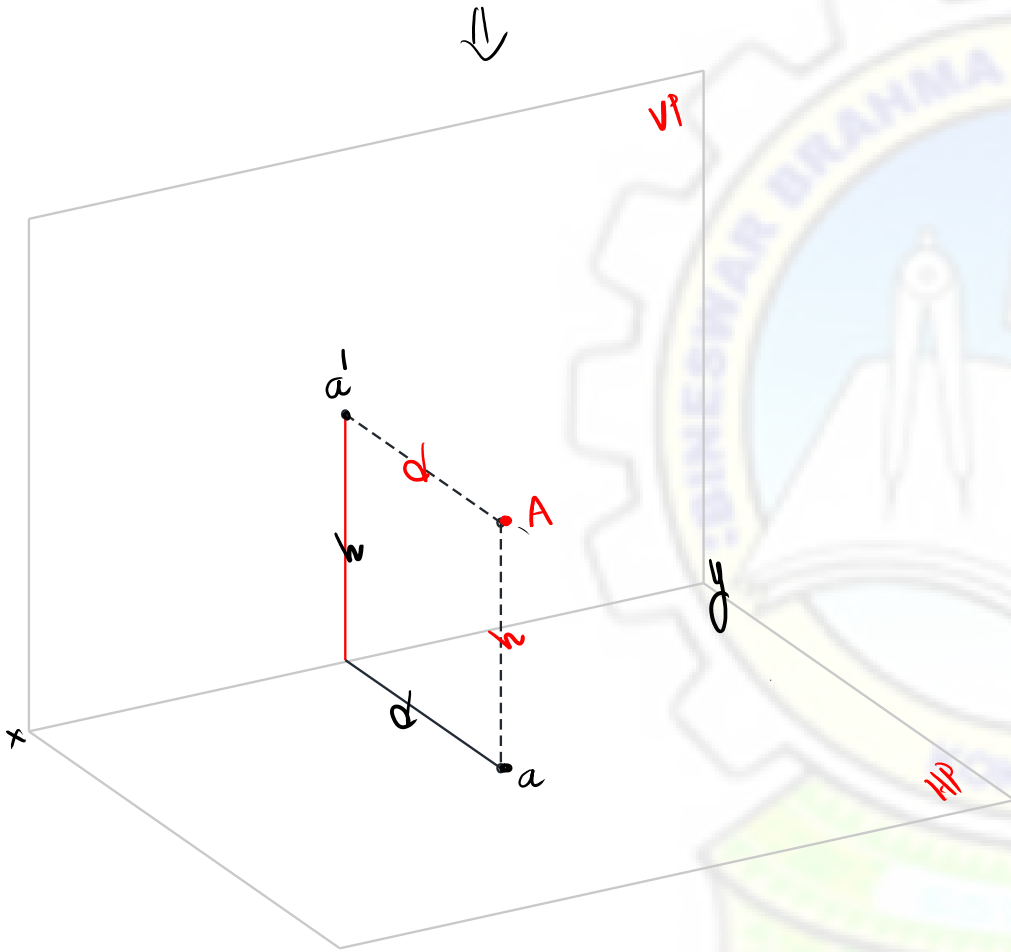
① h & d =>
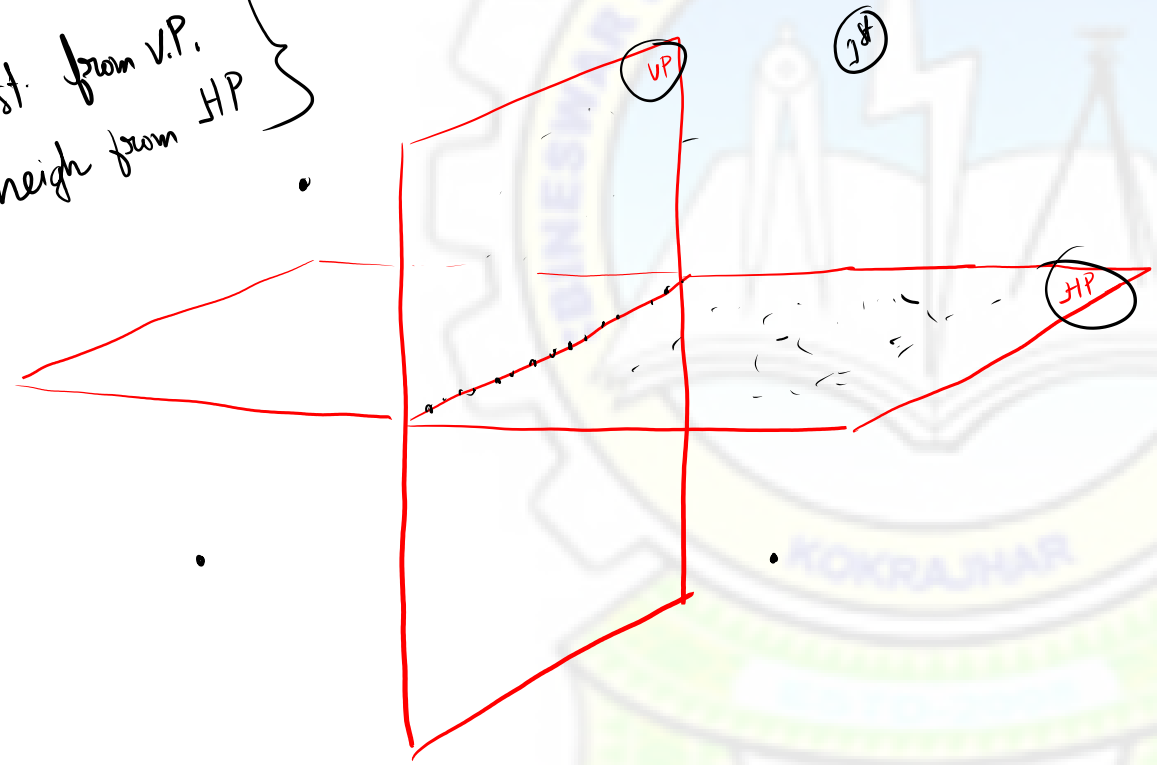
② h = 0 , d ≠ 0

③ d = 0 , h ≠ 0

④ d = 0 , h = 0

* ● 1st angle projection:

⊛ Project a point "A" which is "h" height above H.P and "d" distance infront of V.P.

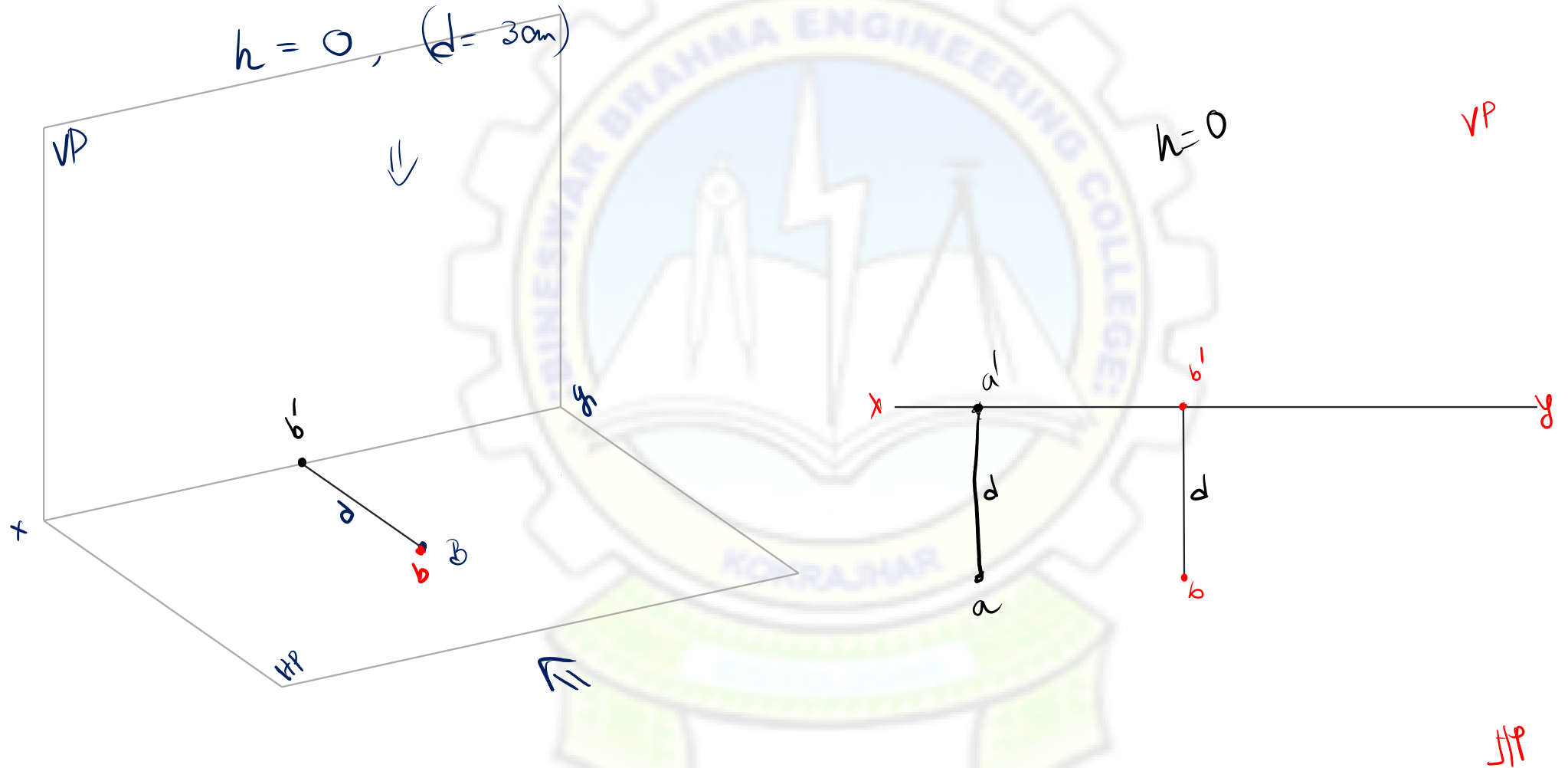VP

T.V. → a
F.V. → a'
S.V → a"

(F.V.) a'
d
h
A
d
h
(T.V.) a

a'
h
x ——————————————————————— y
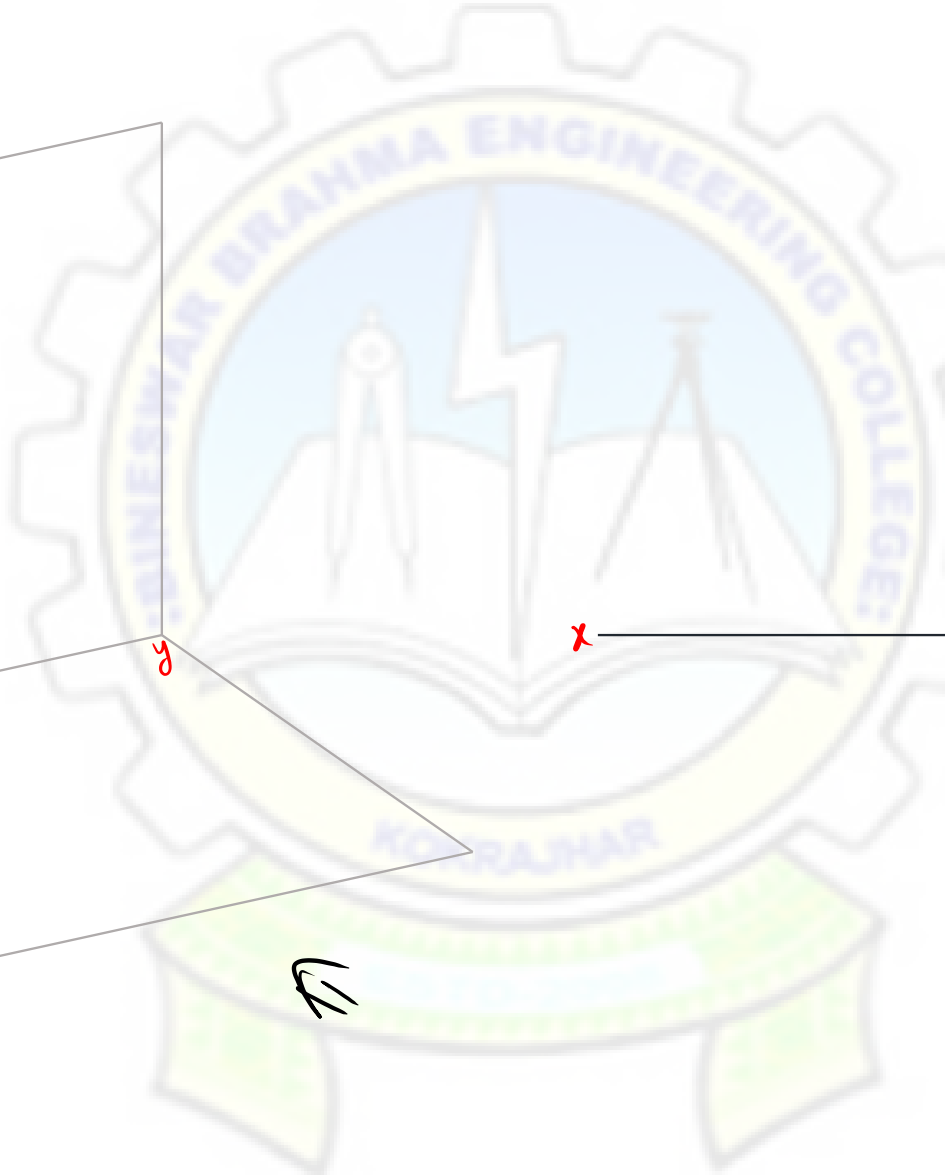d
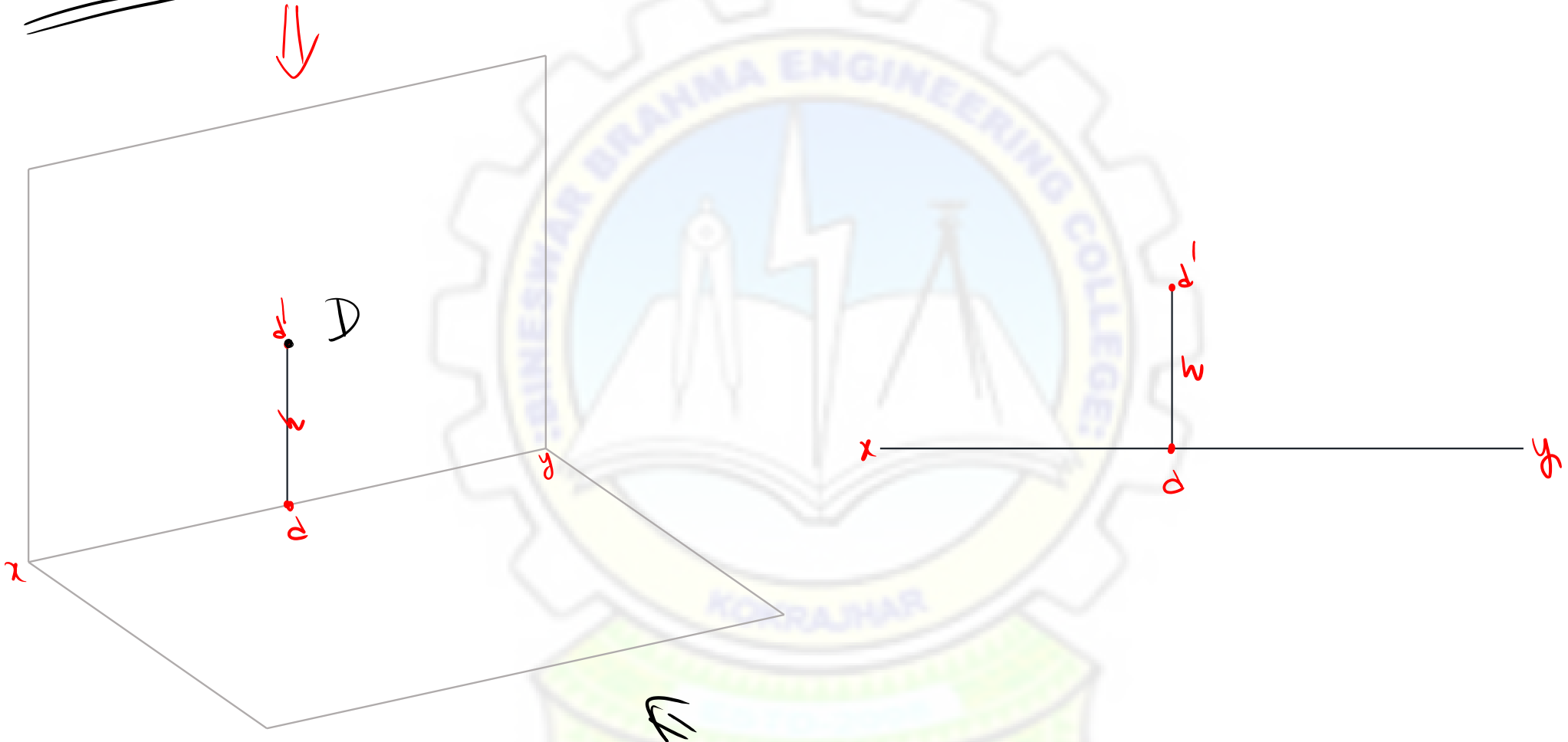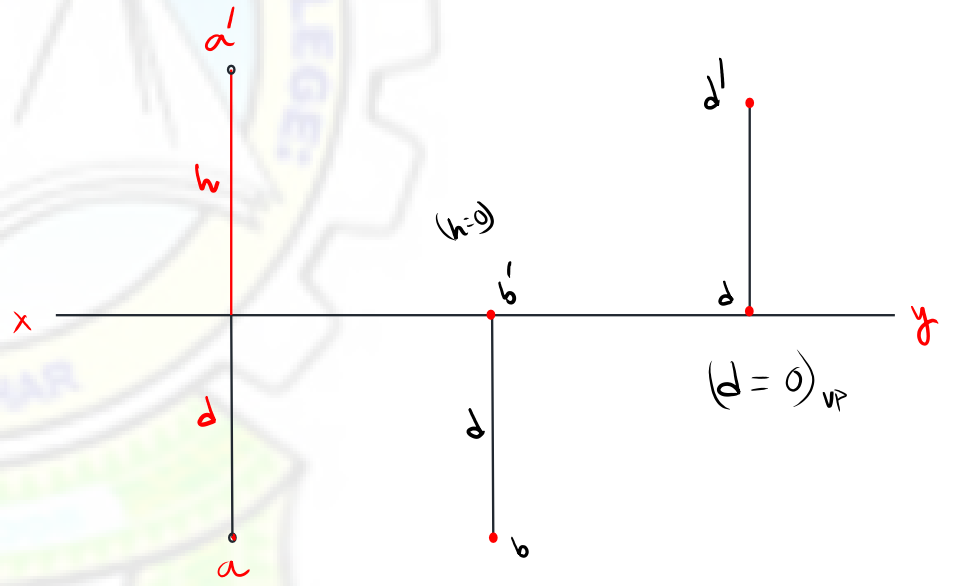a

x

VP

a'

d

A

n

n

d

a

x

y

HP

a'

n

X

d

y
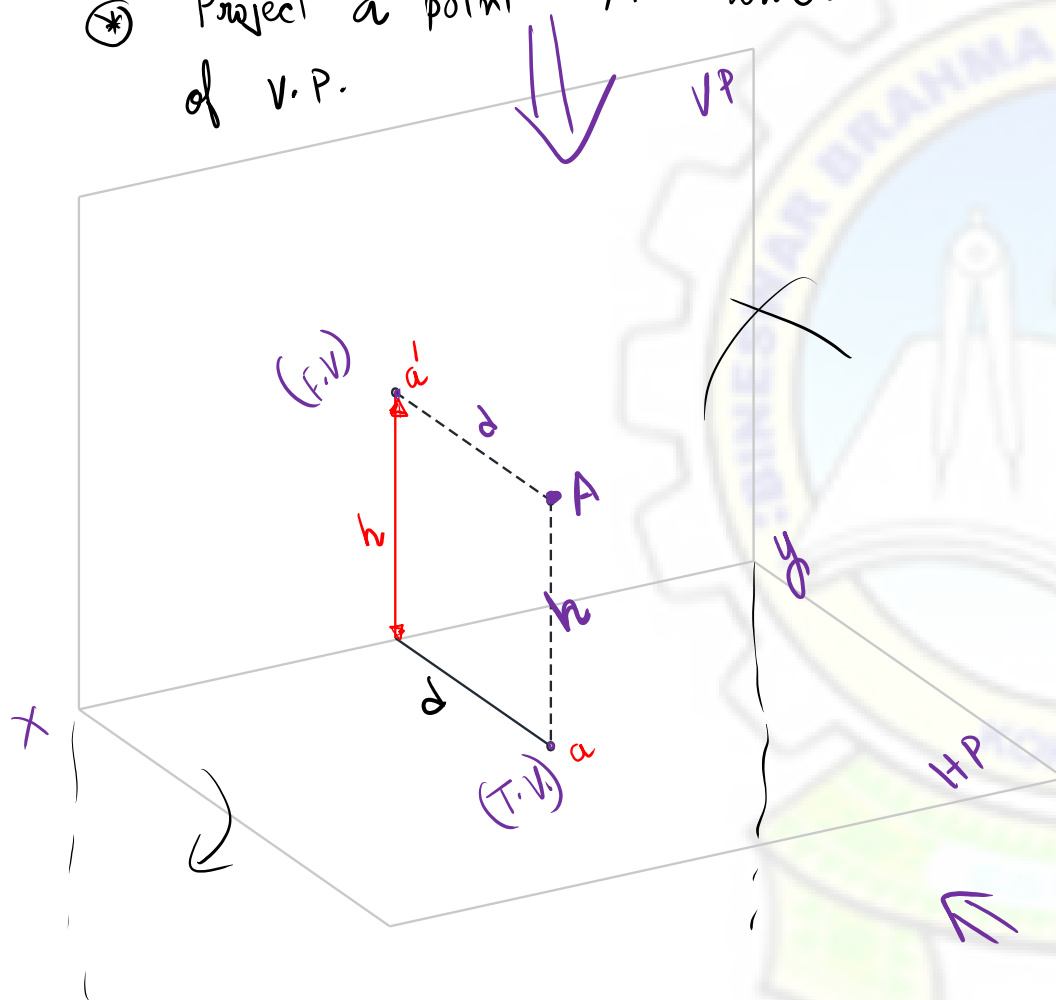
a
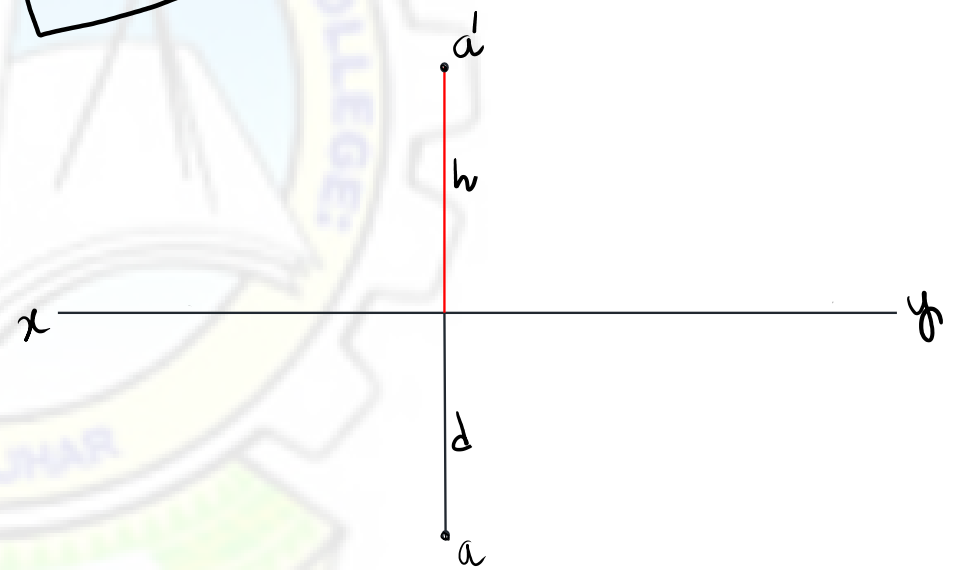
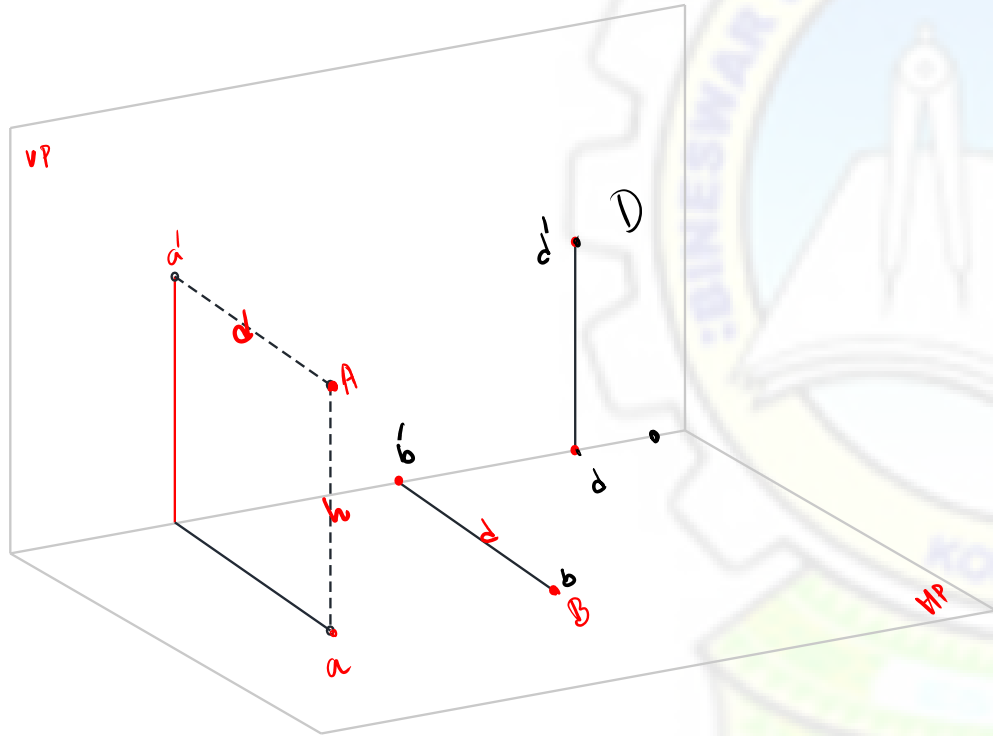* Project a point 'B' which is directly on HP and 'd' dist infront of the VP.
(3cm)

h = 0, (d = 3cm)

VP

h = 0

VP

h = 0

b'

x

a'

y

b'

y

d

d

d

b

B

b

a

b

HP

HP

d = 0

D

x

y

d'

h

d

x

y

d'

h

d

VP

D

VP

a'

d

A

b

d'

d

h

b

B

h

a

MP

AP

a'

h

(h=0)

b'

d'

x

d

d

(d=0)vp

y

a

b

h → HP

d → VP

A

VP

l'

h

x————————————y

d

a

HP
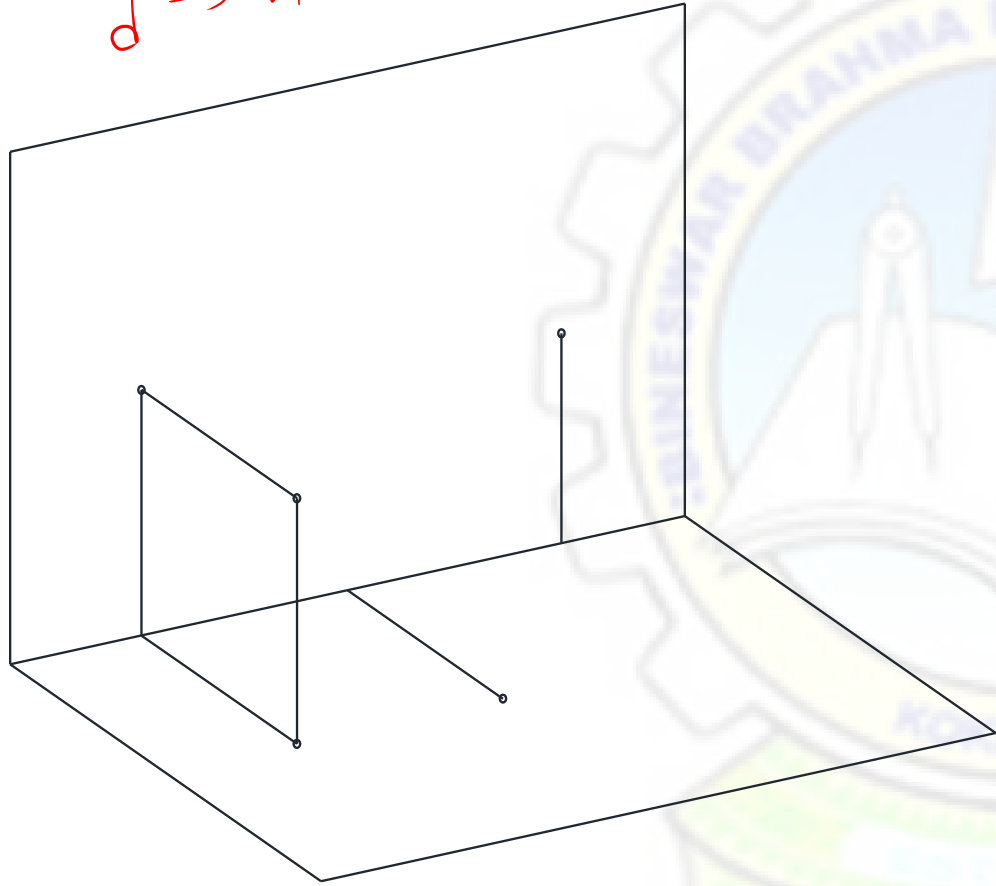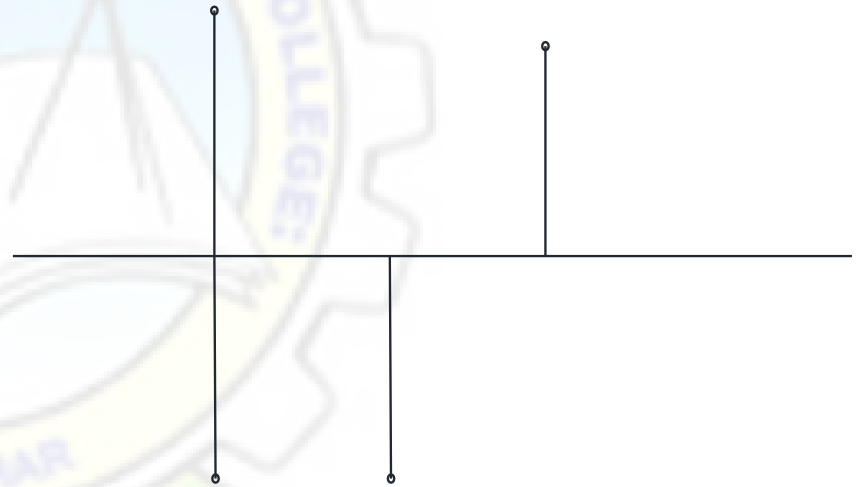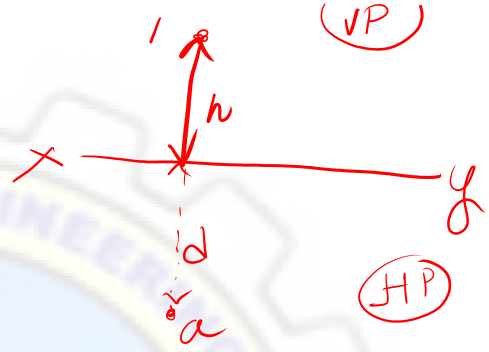
2nd angle projection:

* Point 'A' is 'h' height above HP & 'd' dist behind V.P.

$$[d > h]$$

$$\frac{\text{(HP)}}{\text{(VP)}}$$

VP

A

d

h

a'

h

a

d

HP

x

y

x

d

h

a

a'

y
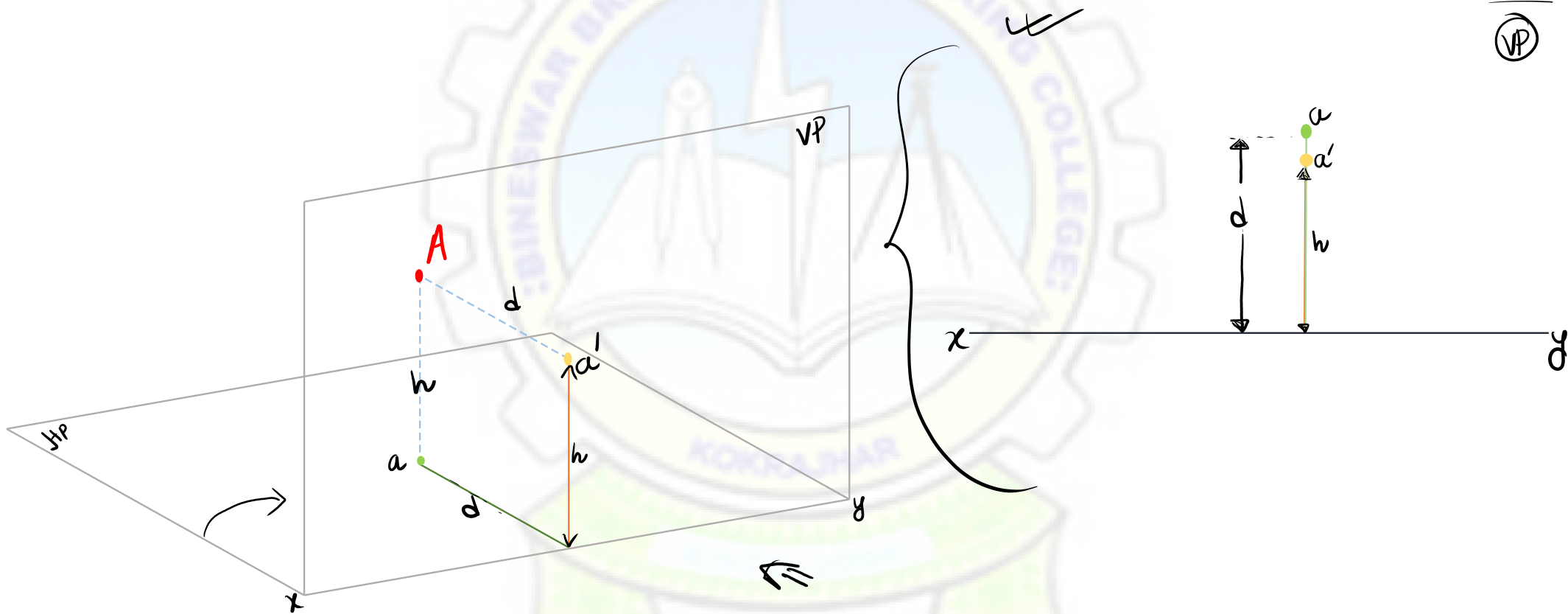
(★) A is on HP & 'd' dist behind VP
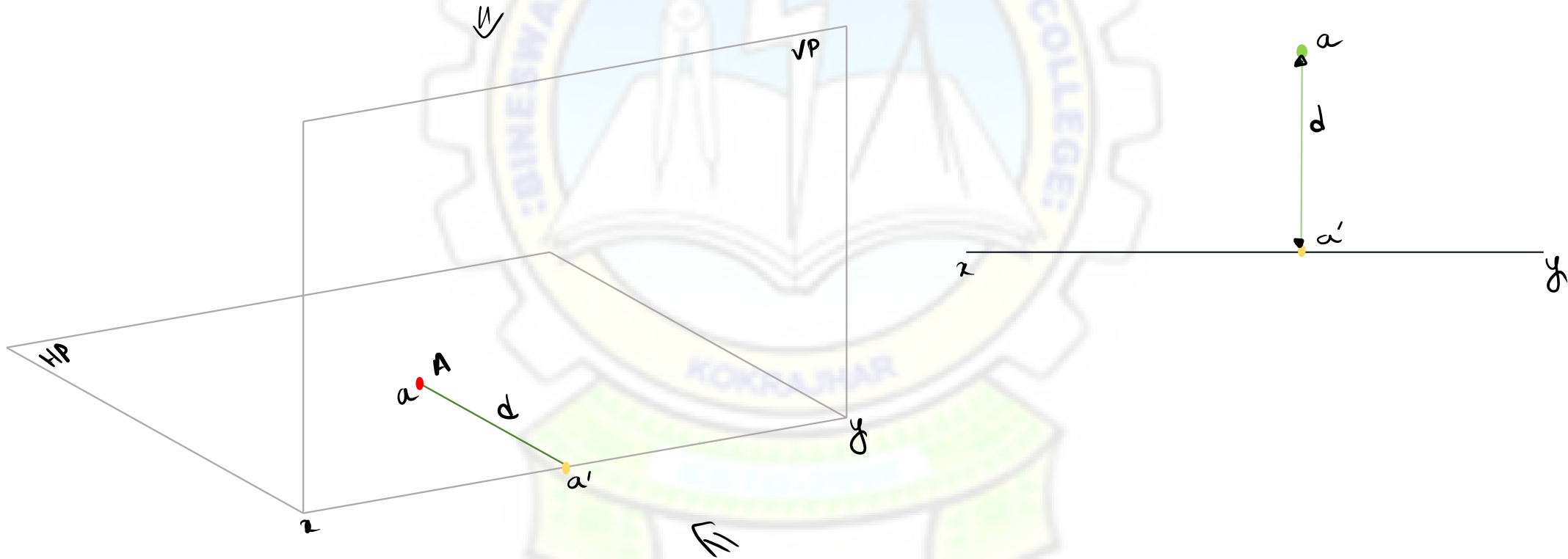
(*) Point A is on 'VP' & 'h' dist. above HP

⇓

A → HP & VP
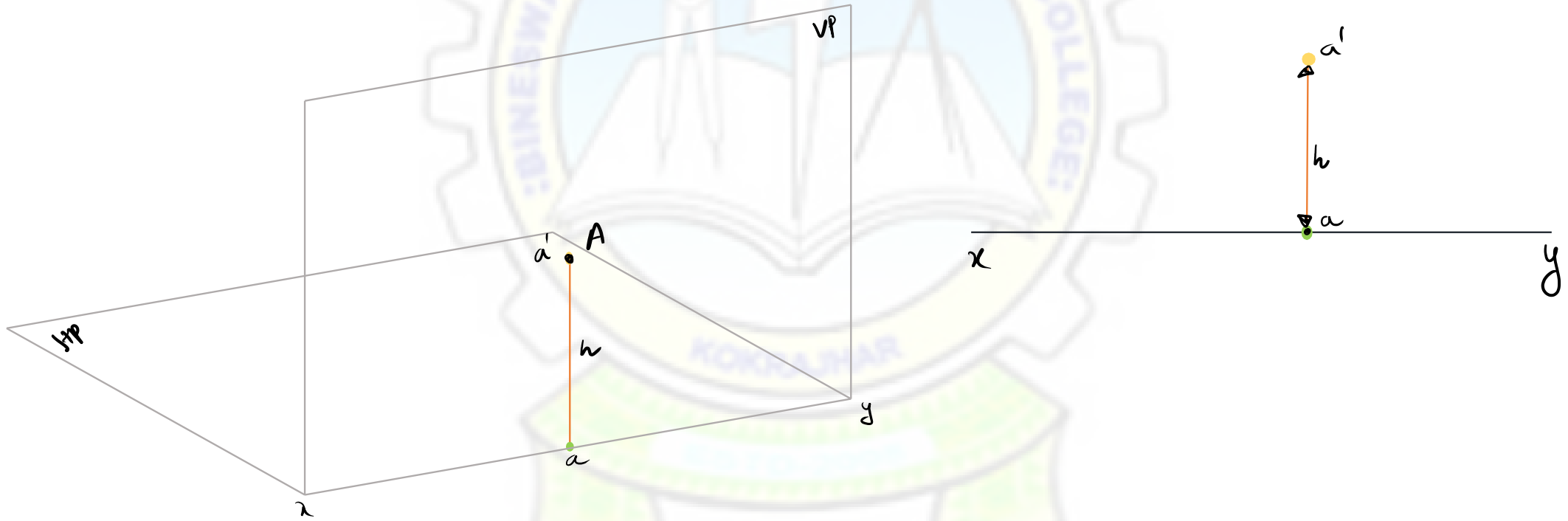h=0 d=0

VP

a' A

x

a'

h

a

y

HP

h

a

λ

y

a

y

* 3rd angle projection:

* Point 'A' is 'h' height below HP & 'd' dist behind VP

⇓

HP

a

d

x

h

h

A

d

a'

y

VP

x

a

d

HP

h

y

a'

3ʳᵈ

VP
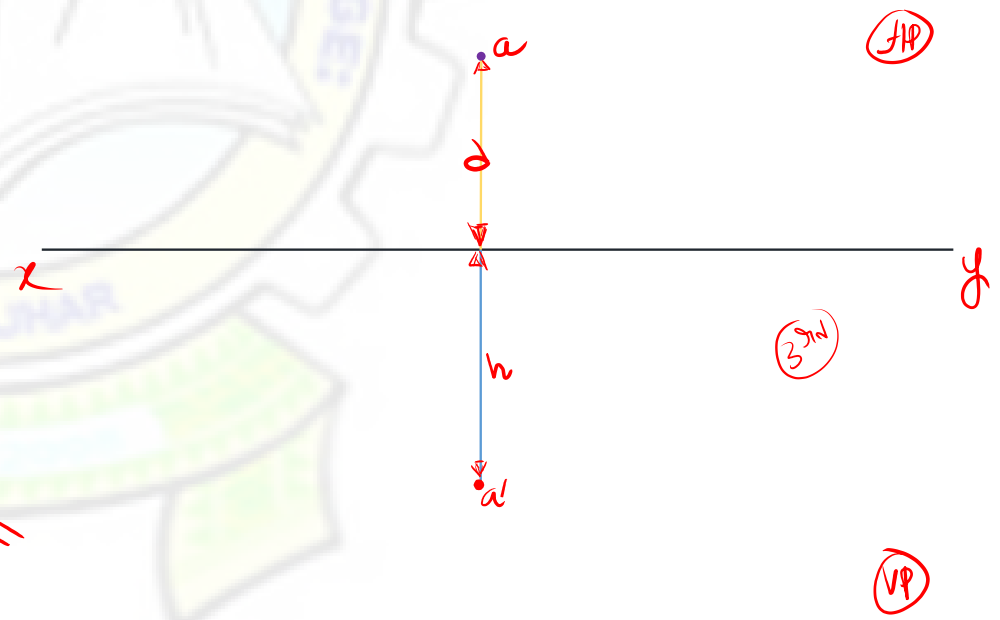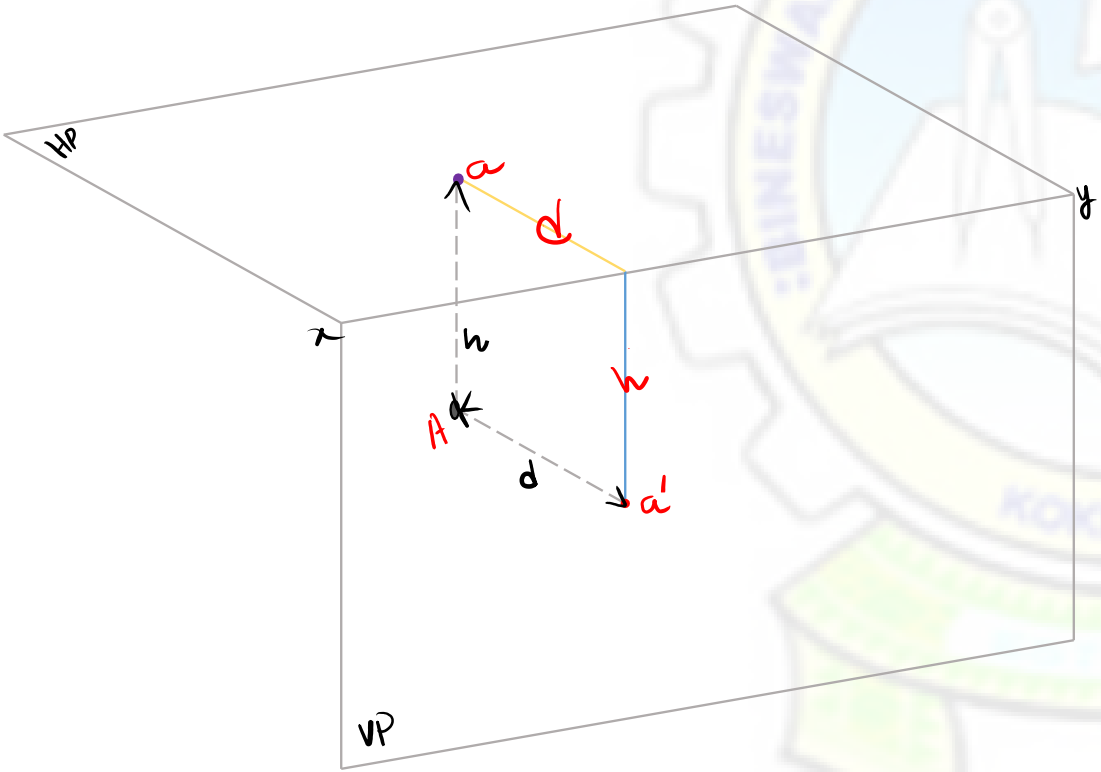
* Point 'A' is directly on HP & 'd' dist behind VP

⇓

HP

a

A

d

a'

x

y

VP

x

a

d

a'

y
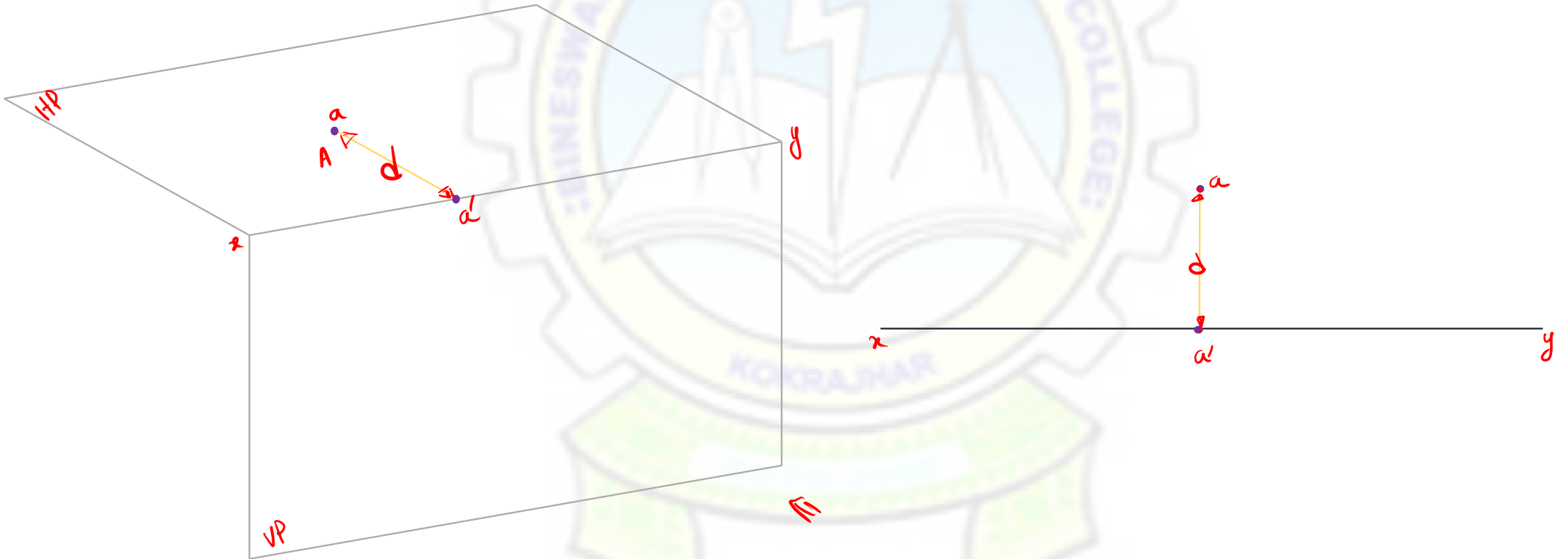
* Point A' is on VP & h heigh below HP

HP

y

a

x

h

a' A

VP

a

x

h

a'

y
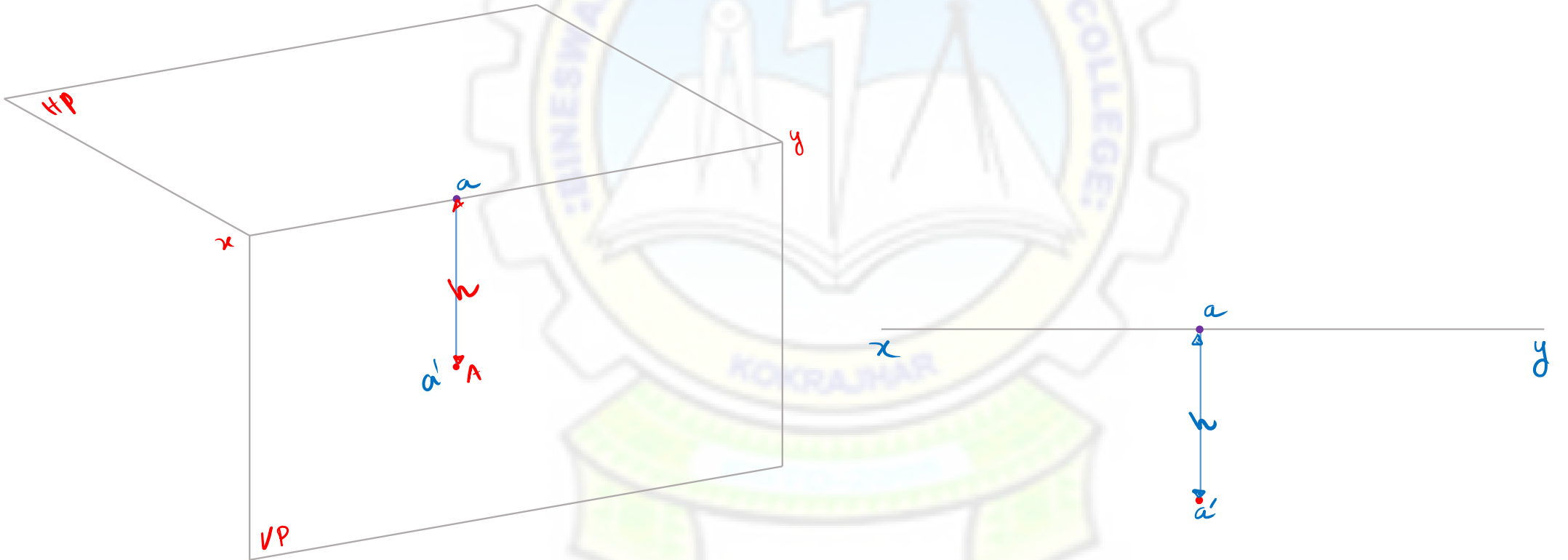
⊛ **4ᵗʰ angle projection**

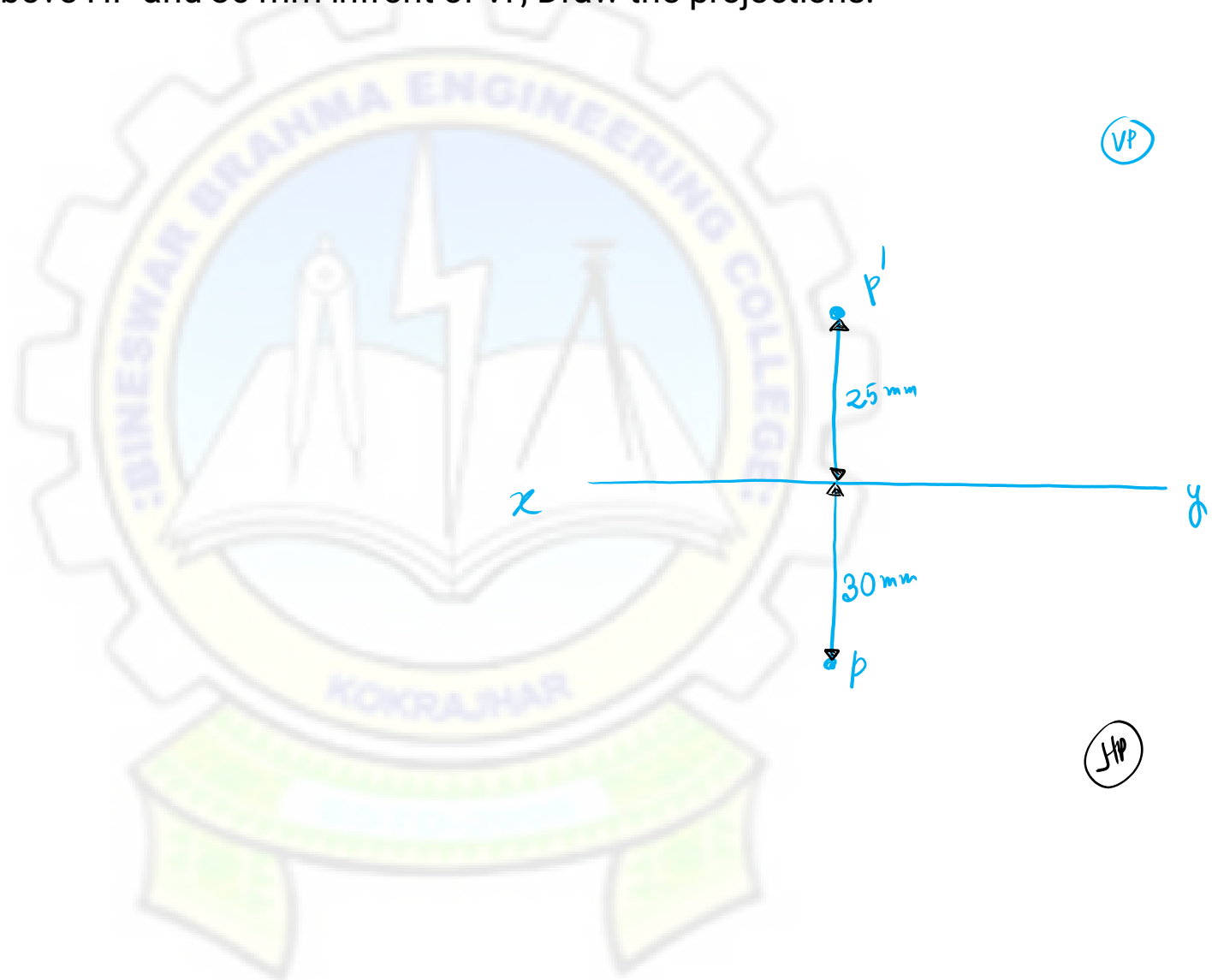* Point is below HP & infront of VP

⇓

4th

VP

HP

• a

°• a'

Q.1 A point **P** is 25 mm above HP and 30 mm infront of VP, Draw the projections.

Sol^n

$h = 25\ mm$

$d = 30\ mm$

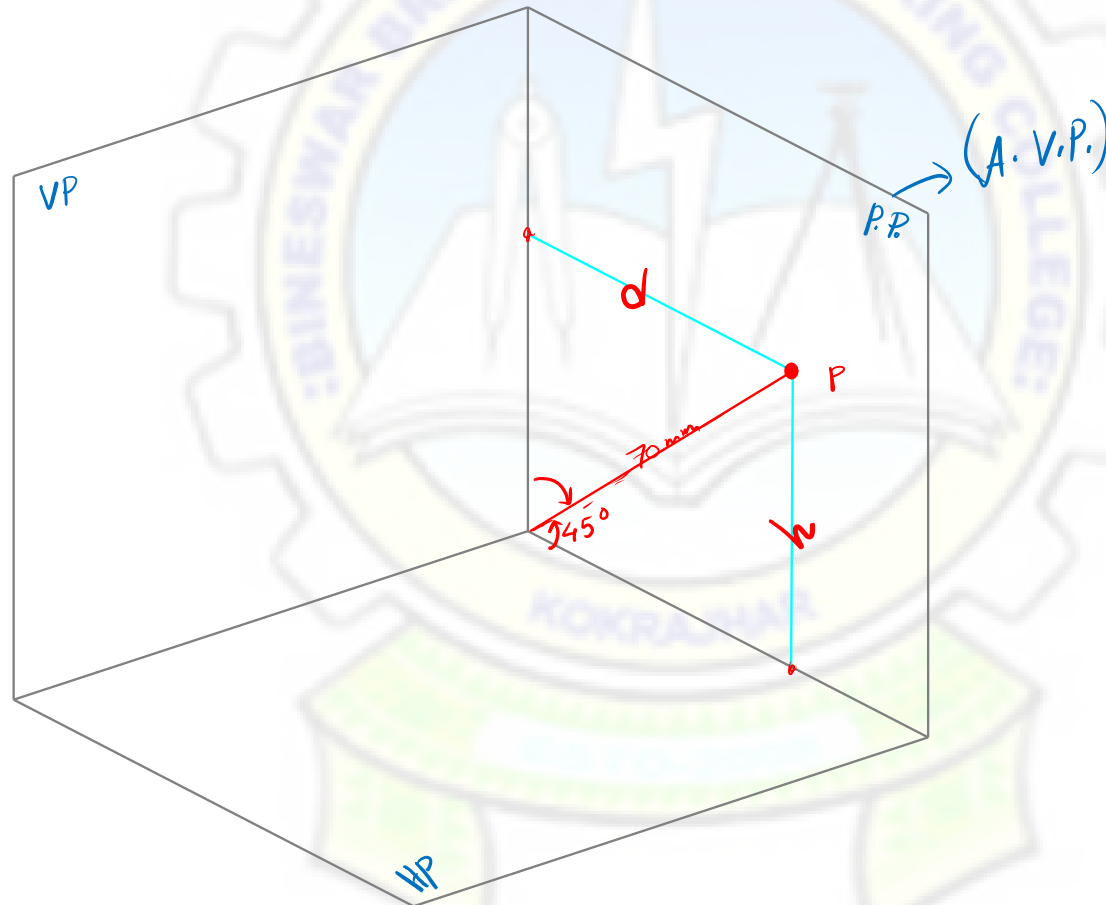**Q.2** A point **P** is 20 mm below HP and 30 mm behind VP, Draw the projections.

Sol^n

$h = 20\ mm$

$d = 30\ mm$

HP

p

30 mm

x ———————————————— y

20mm

p'

VP
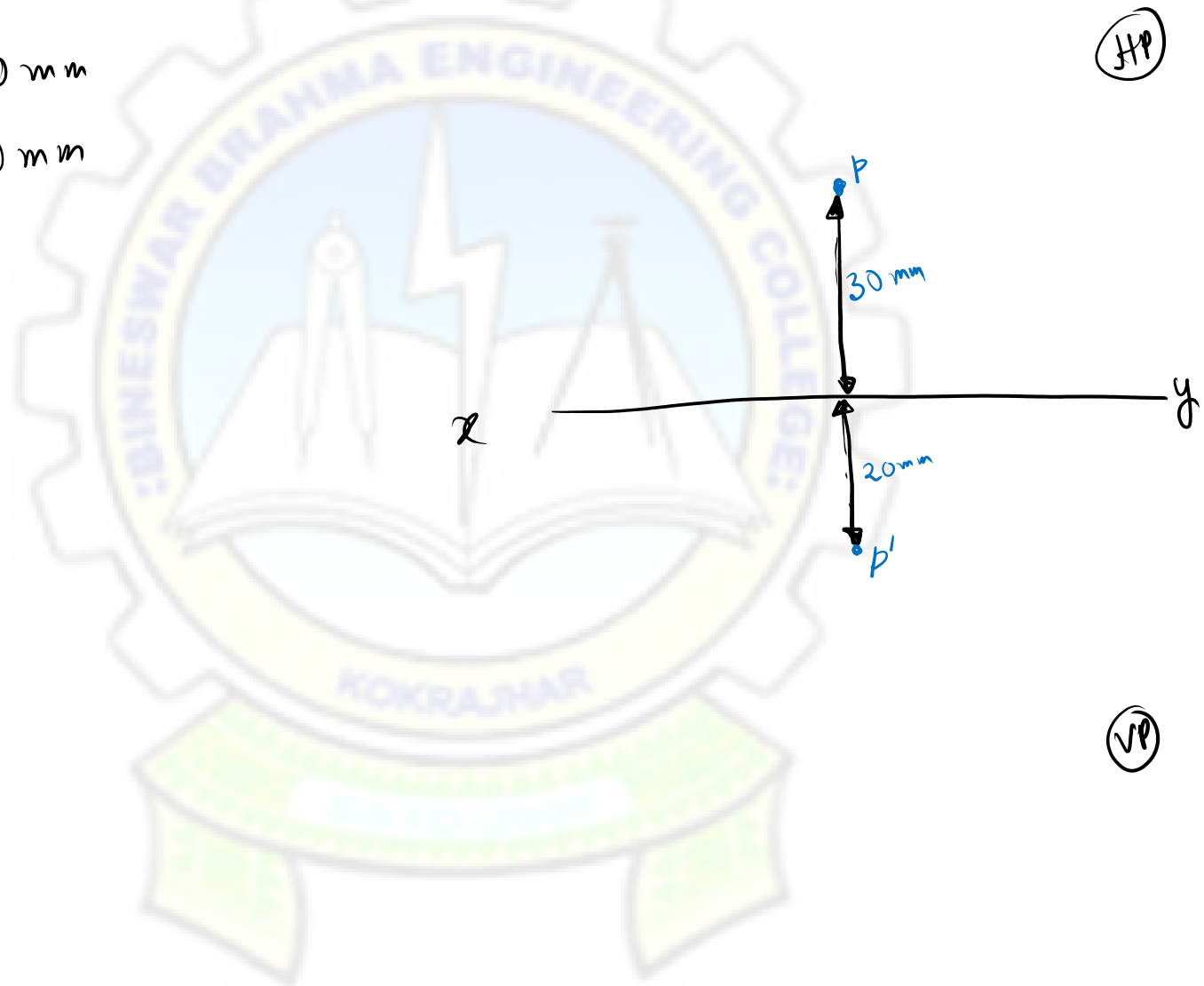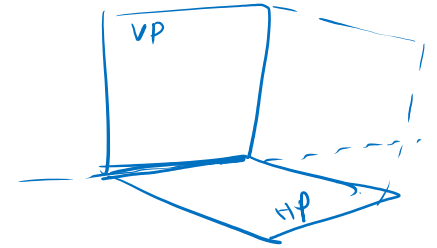
Q.3 A point P is in 1st quadrant. Its shortest distance from the intersection point of HP, VP and Auxiliary Vertical Plane perpendicular to HP and VP is 70 mm and is equidistant from both principal planes. Draw the projection of the point and determine its distance from both HP and VP
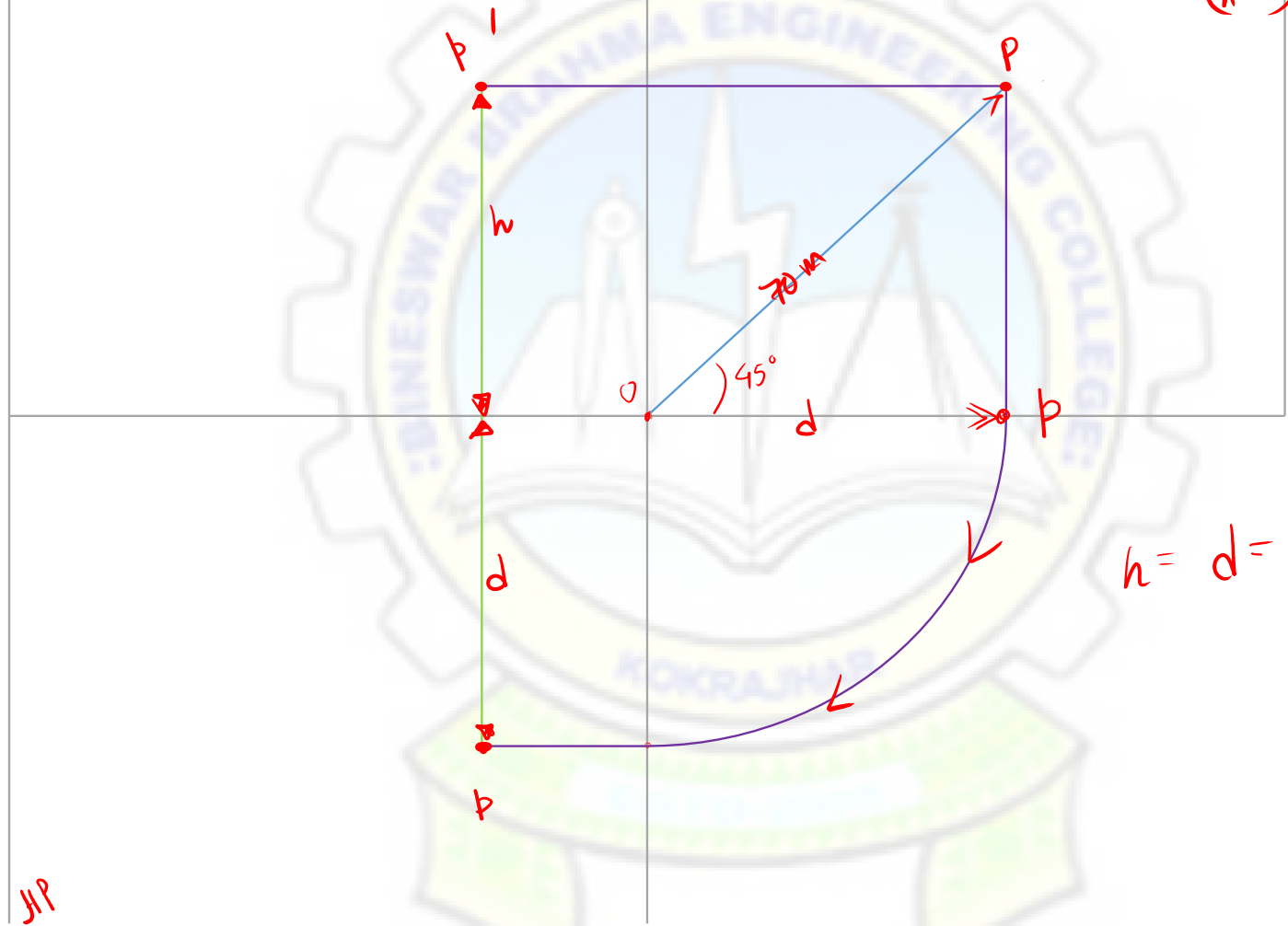
(HP / VP)

$(h = d)$ ✓

VP

P.P. → (A.V.P.)

d

P

70 mm

45°

h

VP

HP

$x = y$

VP

p'

P

h

70 m

O

45°

p

d

d

p

h = d = 70 cos 45°

JP

Thank You