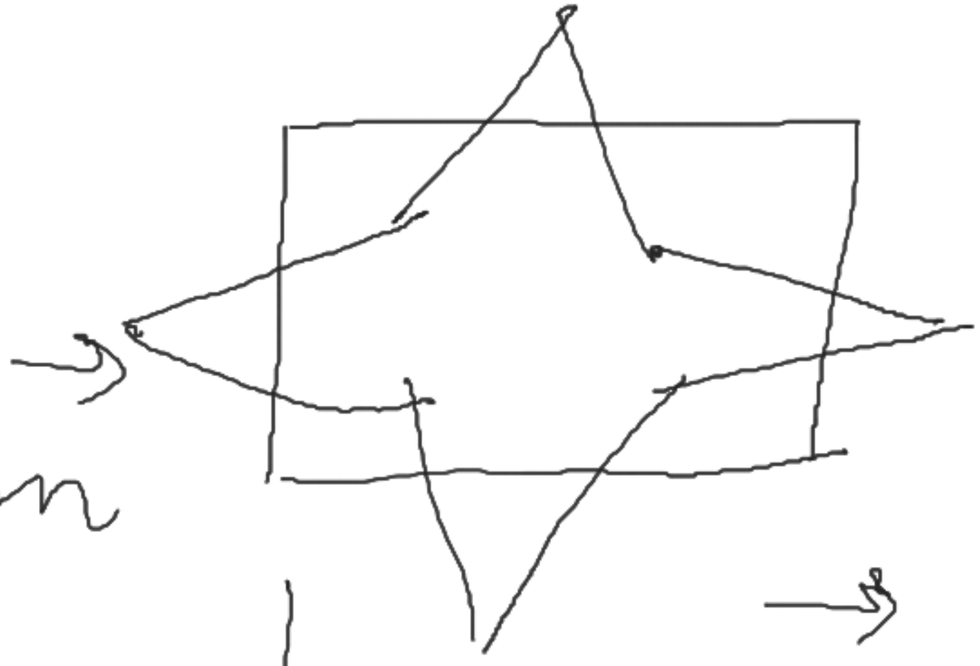
Polygon Clipping Algorithms :-

→ Sutherland Hodgeman

→ Weiler Atherton

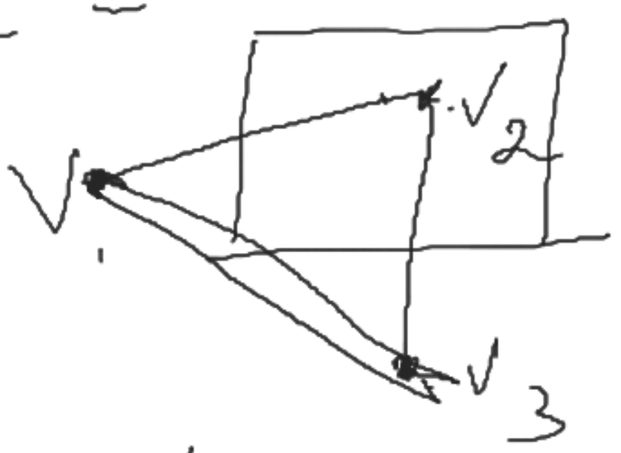


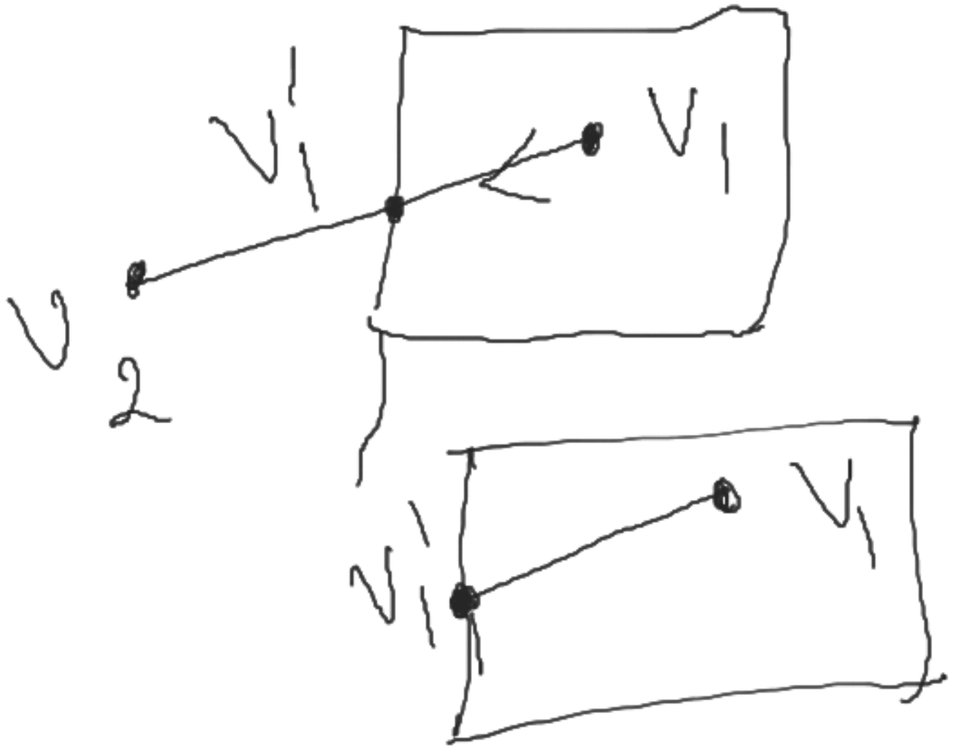
① Left Uip ② Right Uip

③ Top Uip ④ Bottom Uip

Four Different Cases -

(1) Inside - Outside





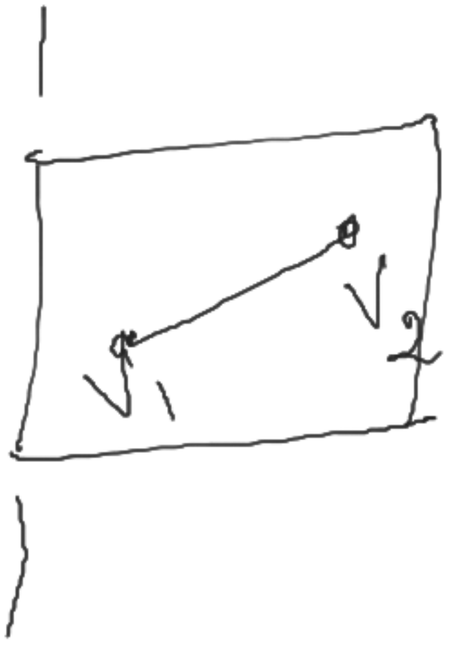
Output → V_1' i.e intersection point

② Outside - Inside

Output - Intersection point + Destination Vertex.

$= V_1' V_2$

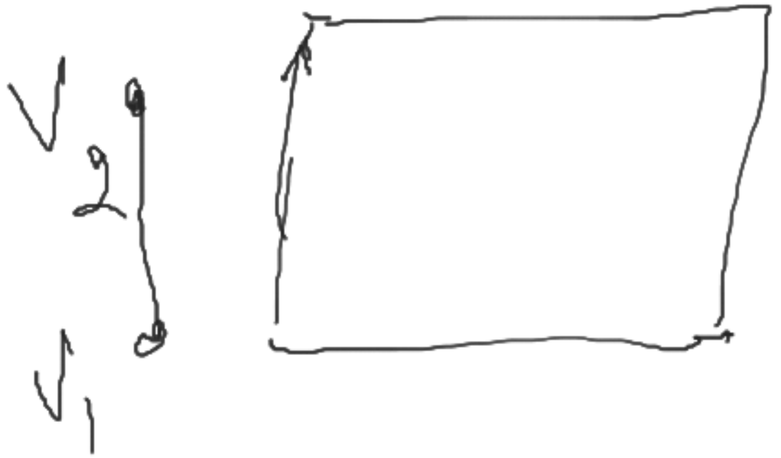
(3) Linie - Linie



Output - Destination
Vertex

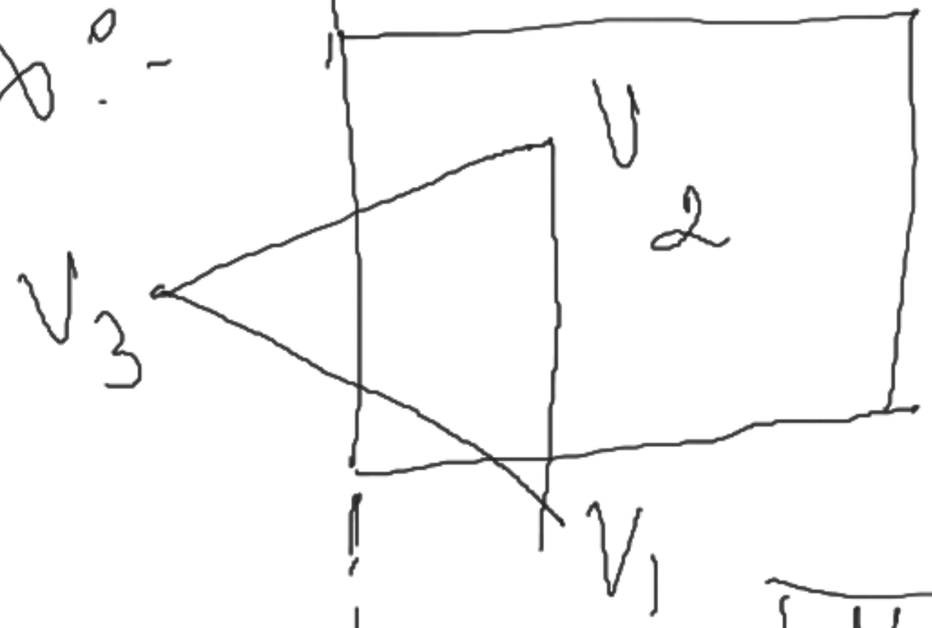
1 e V_2.

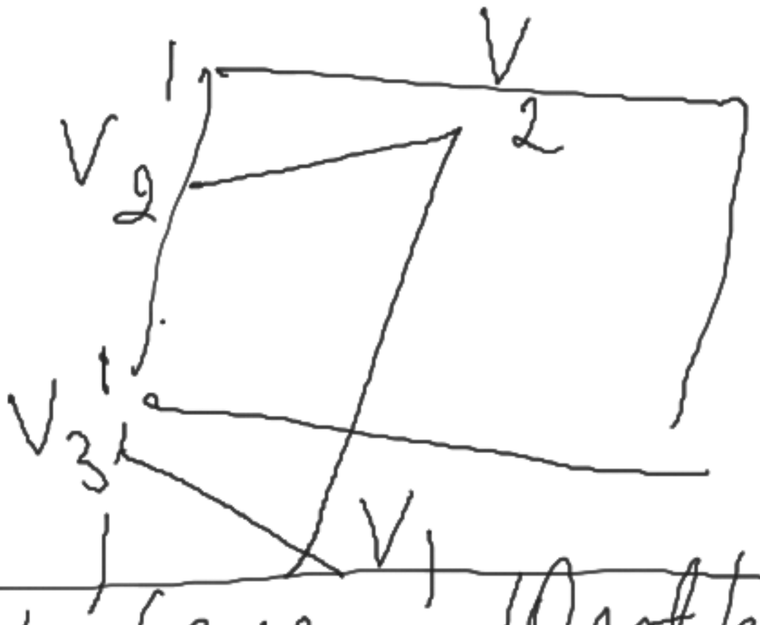
(4) Outside - Outside



Output - NIL

Ex°:-

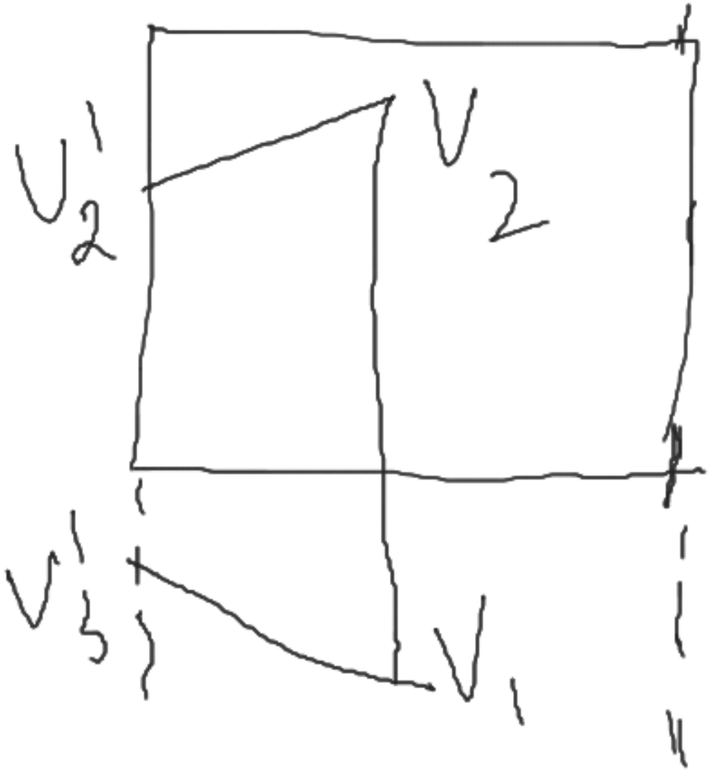




(1) Left Clip :-

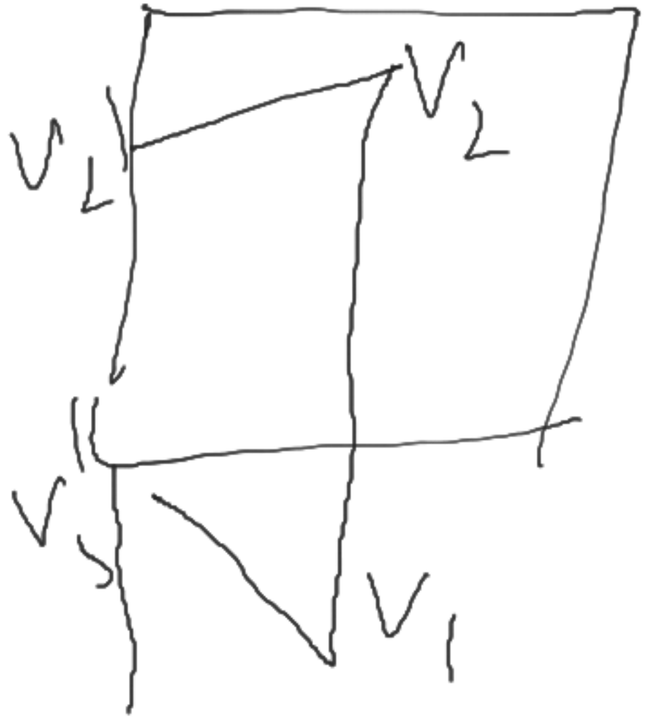
Vertex	Case	Output
→ $V_1 V_2$	In - In	V_2
→ $V_2 V_3$	In - Out	V_2'
→ $V_3 V_1$	Out - In	$V_3' V_1$

② Right Clipping



Vertex	Case	Output
$V_1 V_2$	In - In	V_2
$V_2 V_2'$	In - In	V_2'
$V_2' V_3'$	In - In	V_3'
$V_3' V_1$	In - Ins	V_1

③ Top Clipping –



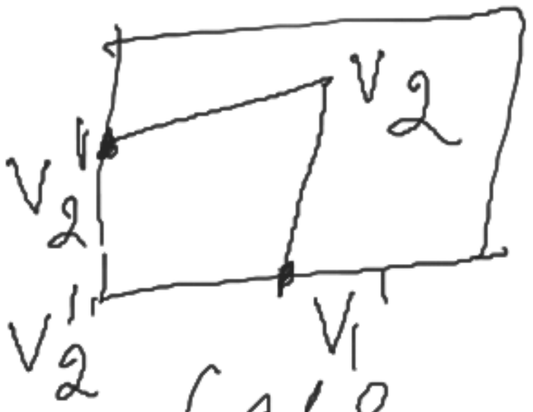
$v_1 v_2$ – v_2

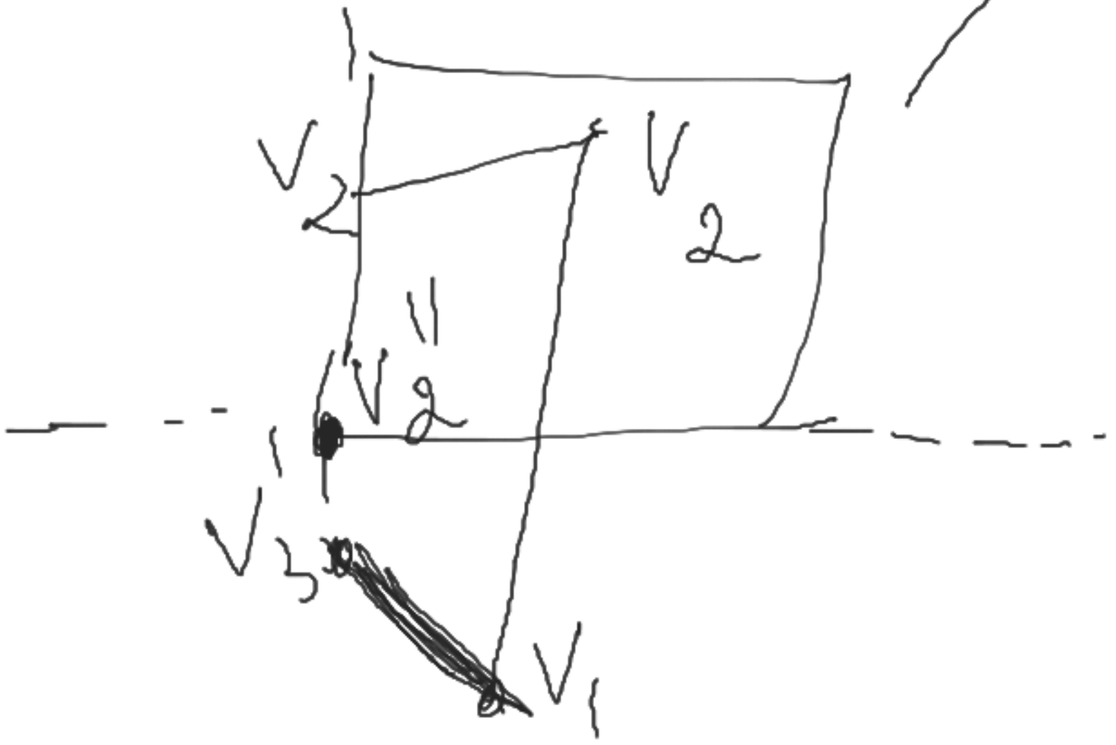
$v_2 v_2'$ – v_2'

$v_2' v_3'$ – v_3'

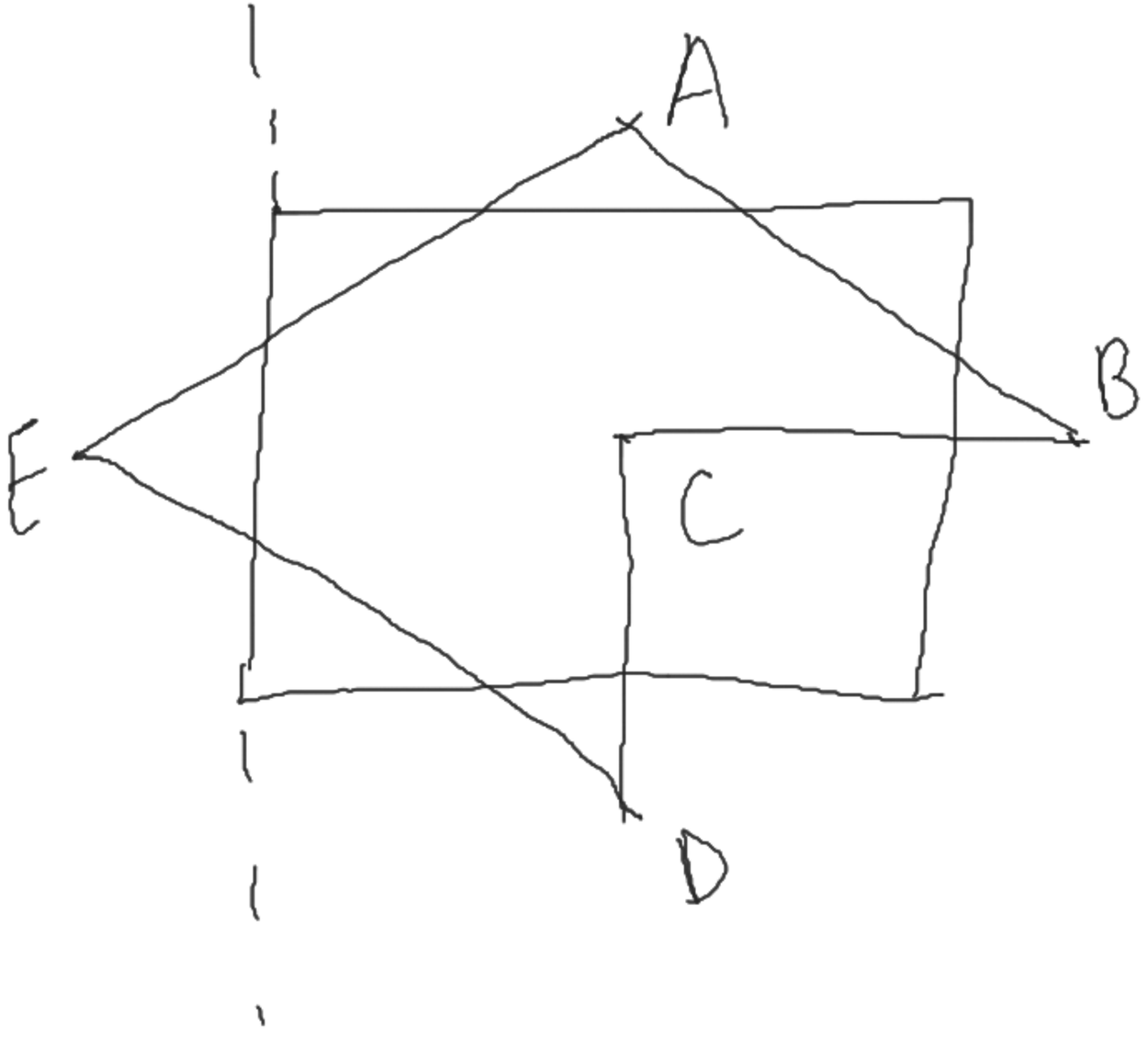
$v_3' v_1$ – v_1

(4) Bottom Unf -





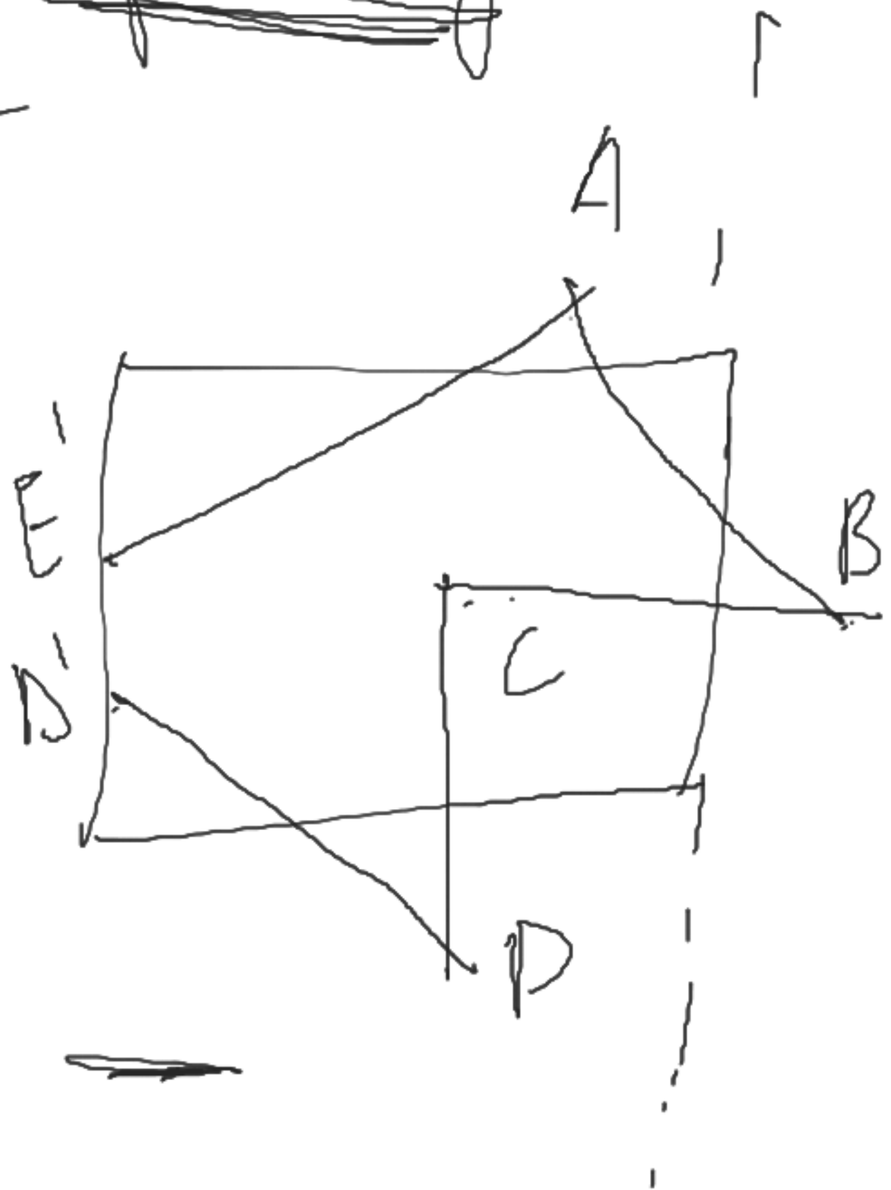
Vertex	Case	Output
V_1 V_2	Out-In	V_1' V_2
V_2 V_2'	In In	V_2'
V_2' V_3'	In-Out	V_2''
V_3' V_1	Out Out	Nil



Solve it using Sutherland Hodgeman Polygon clipping Algorithm.

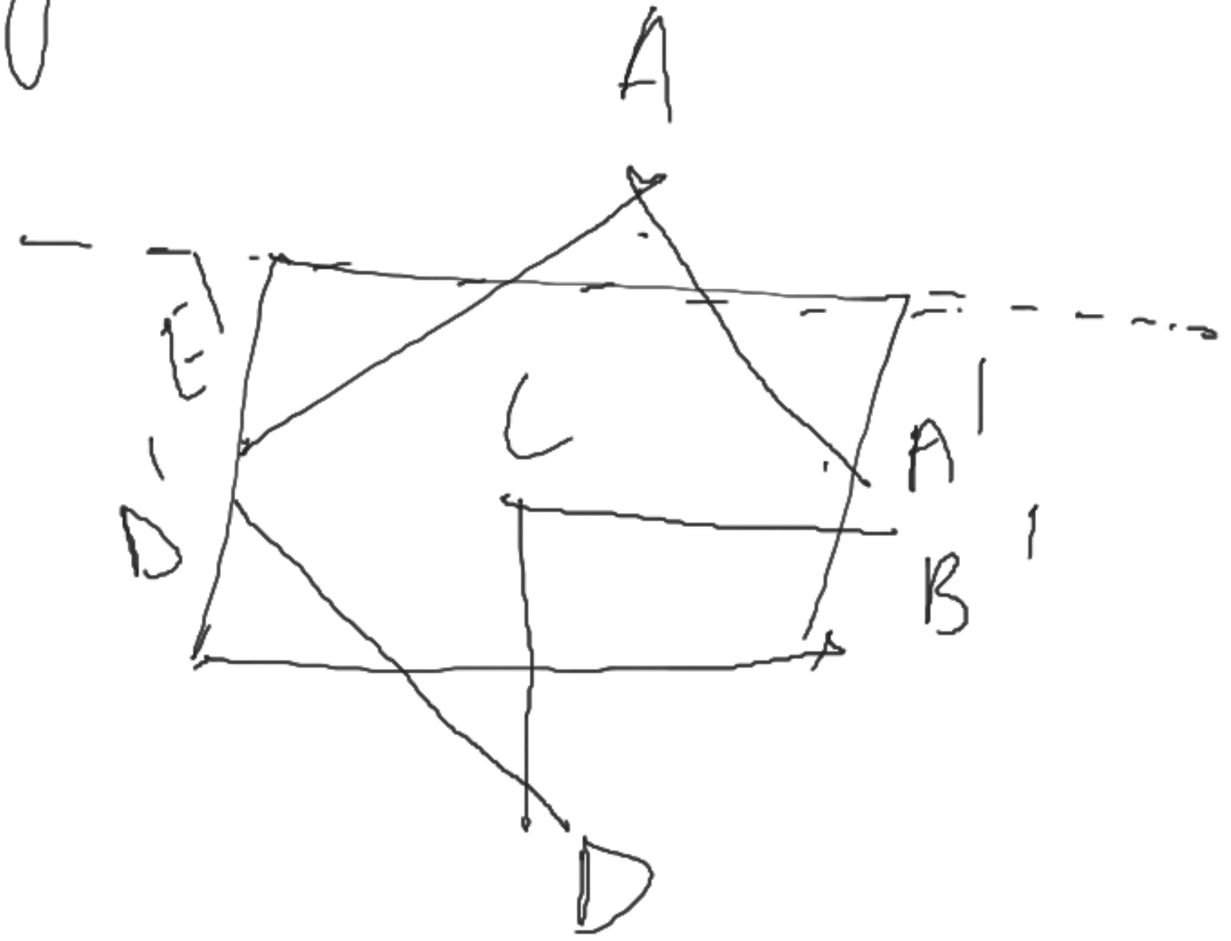
(1) Clipping against left edge

Vertex	Case	Output
AB		B
BC		C
CD		D
DE		D'
EA		E' A



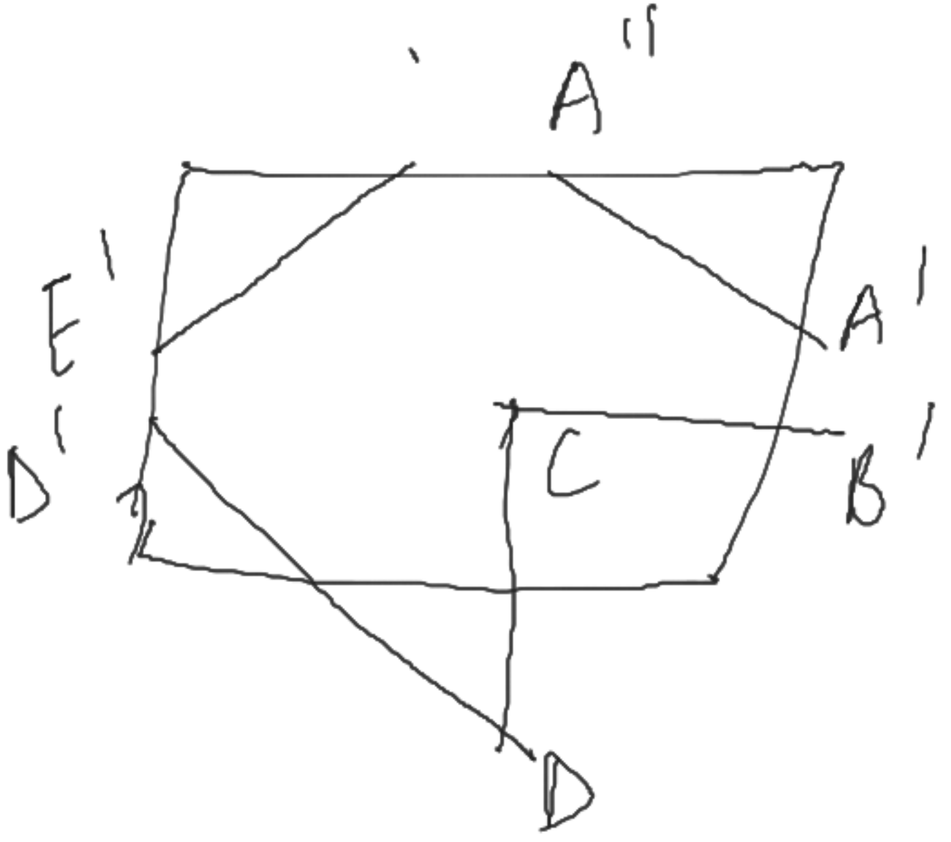
② Right Lifting :-

AB	A'
BC	B'C
CD	D
DD'	D'
D'E'	E'
E'A	A



(B) Tilpasning –

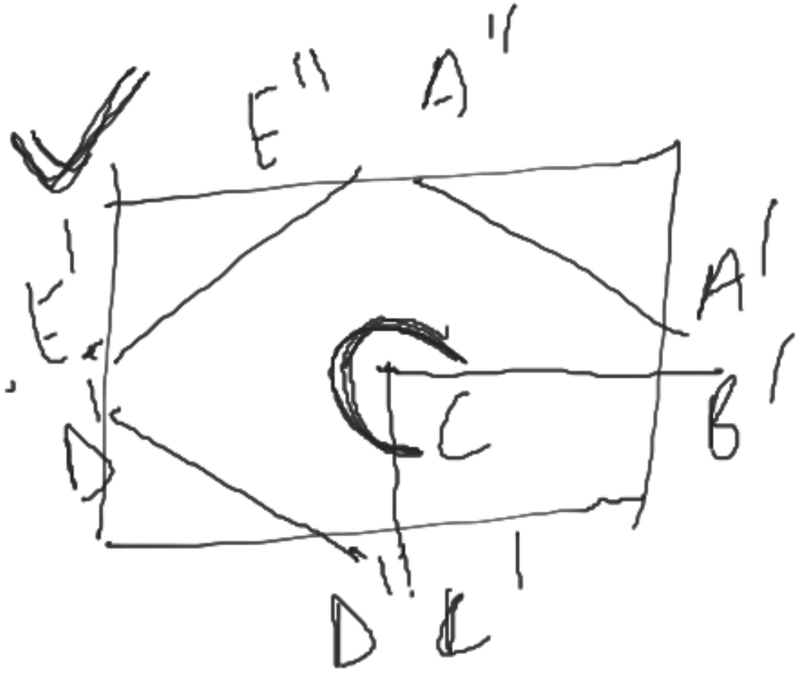
AA'	–	$A''A'$
$A'B'$		B'
$B'C$		C
CD		D
DD'		D'
$D'E'$		E'
$E'A$		E''



(4) Bottom Welding.

A'' A'
A' B'
B' C
C D
D D'
D' E'
E E''

A → Ln - In
B → Ln - Ly
C → Ln - In.
C' → In - Out
D'' D → Out - In.
E → In - In
E'' → In In -

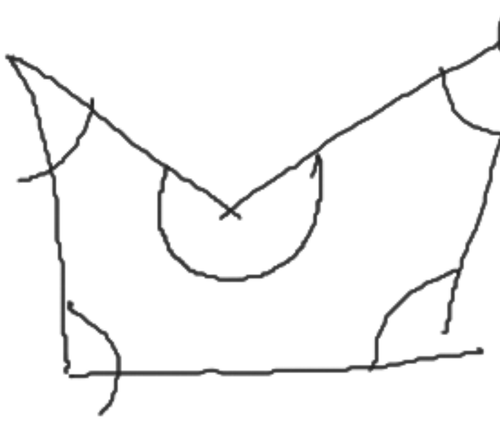


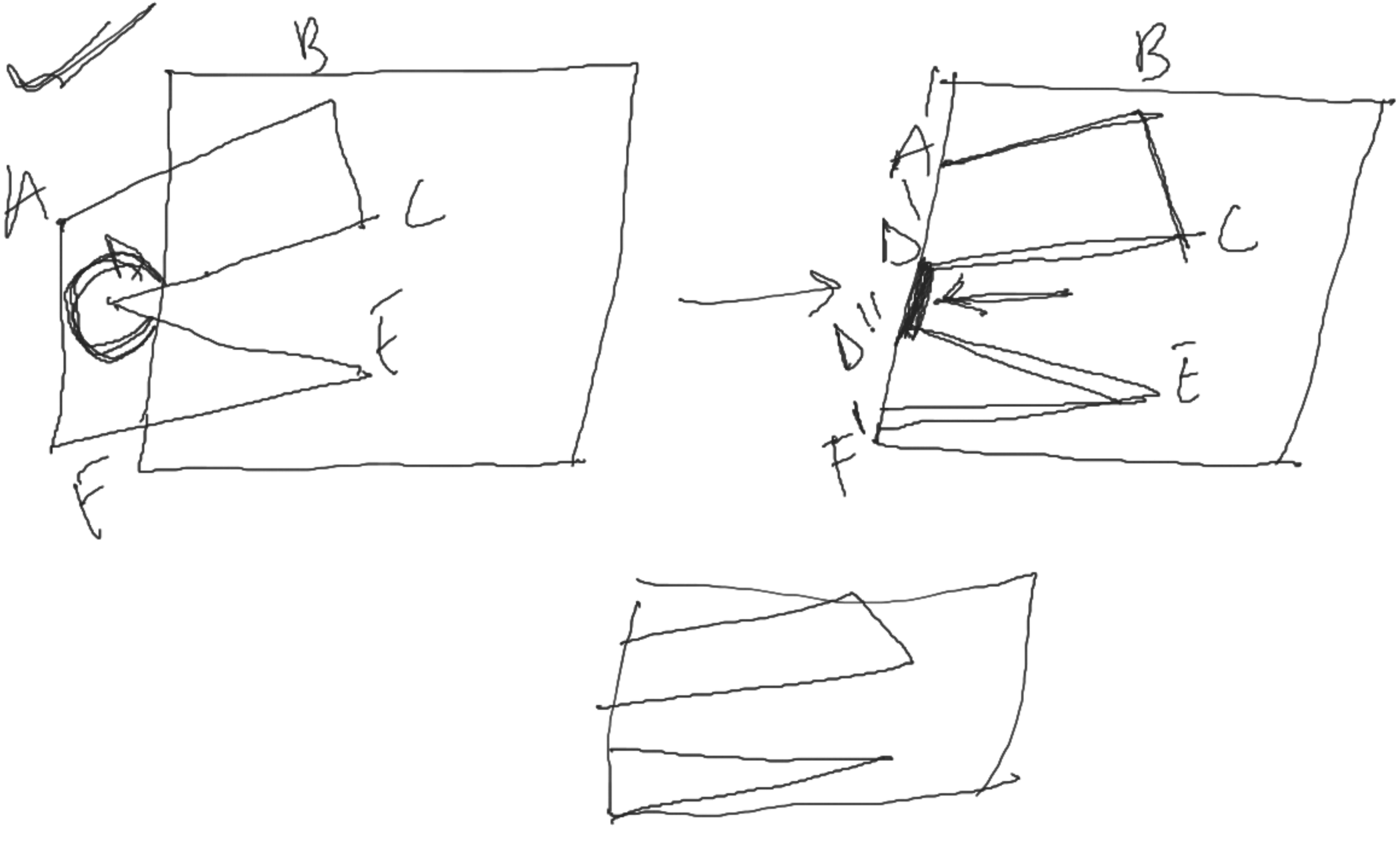
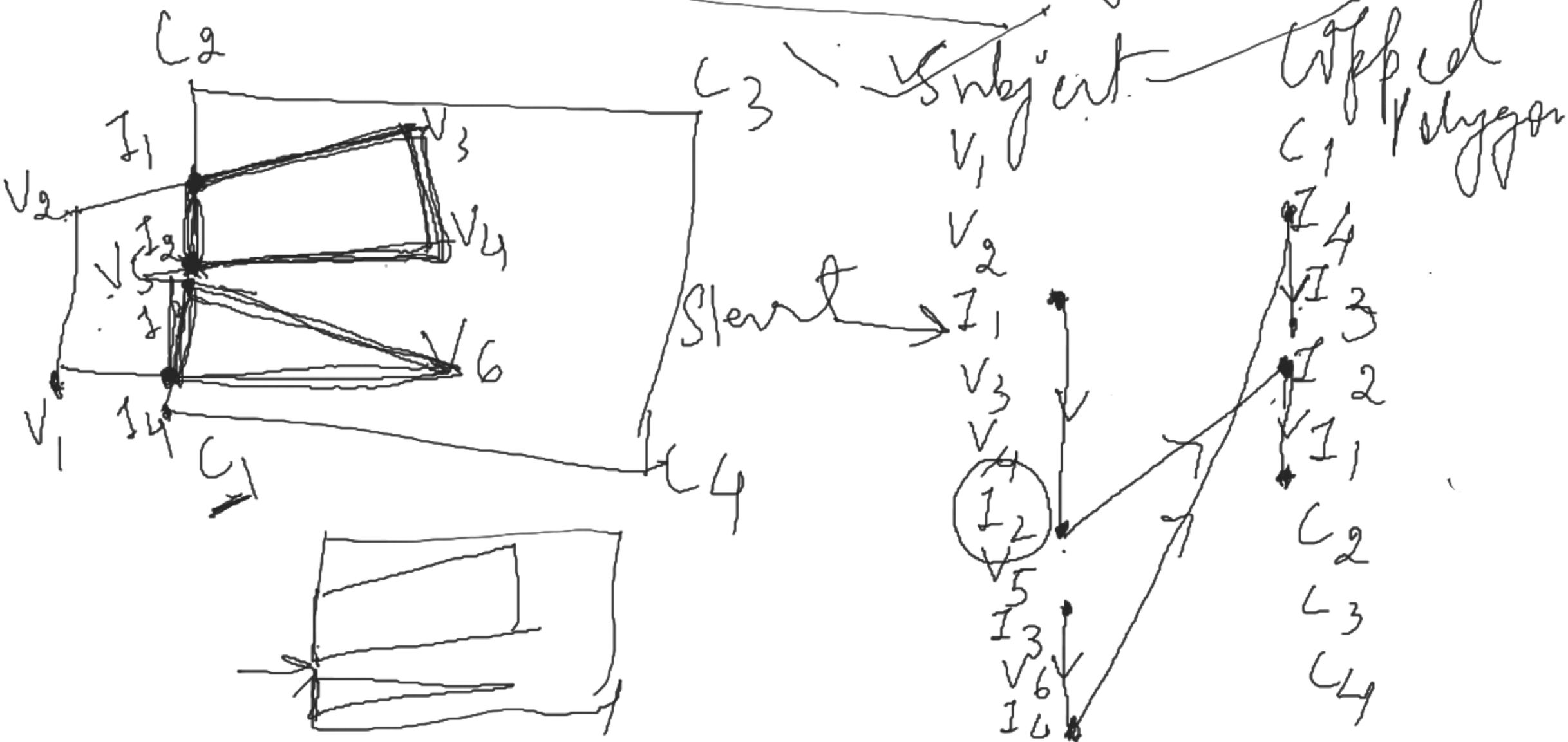
Convex Polygon

Interior Angle $< 180^\circ$

Concave Polygon

One or more Interior angle $> 180^\circ$




B
A
C
E
F
B
A
D'
C
D''
E
F'

→ Weiler - Atherton Algo :-