Name: Nasinun Leo

Id : 20-42195-1

1. For $P_1 P_2 \Rightarrow m = \frac{9-3}{2+2} = \frac{6}{4} = \frac{3}{2}$

$m = \frac{Y_1' - 3}{0 + 2} \Rightarrow \frac{3}{2} = \frac{Y_1' - 3}{2}$

$\Rightarrow Y_1' = 6$

$m_2 = \frac{9 - 8}{2 - X_2'} \Rightarrow \frac{3}{2} = \frac{1}{2 - X_2'}$

$\Rightarrow 6 - 2X_2' = 2$

$\Rightarrow 2X_2' = 4$

$\Rightarrow X_2' = 2$

$\therefore P_1'(X_1', Y_1') = (0, 6) , P_2'(X_2', Y_2') = (2, 8)$

For, $P_3 P_4 \Rightarrow m = \frac{10 + 3}{6 - 4} = \frac{13}{2}$

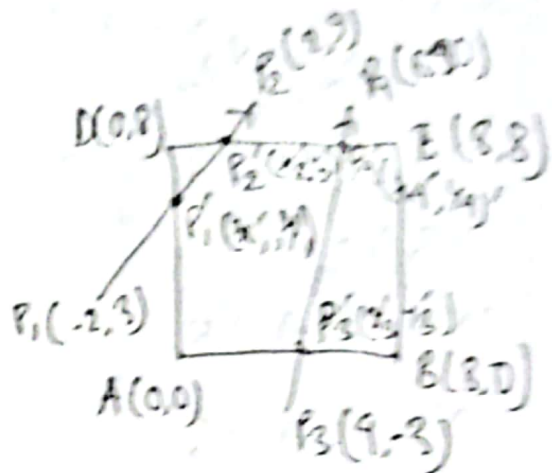$\therefore m = \frac{0 + 3}{X_3' - 4} \Rightarrow \frac{13}{2} = \frac{3}{X_3' - 4}$

$\Rightarrow X_3' - 4 = \frac{6}{13}$

$\Rightarrow X_3' = 4.46$

$\therefore m = \frac{10 - 8}{6 - X_4'} , \Rightarrow \frac{13}{2} = \frac{2}{6 - X_4'}$

$\Rightarrow X_4' = 5.69$

$\therefore P_3'(X_3', Y_3') = (4.46, 0) ; \quad P_4'(X_4', Y_4') = (5.69, 8)$

2. Left clip:

$$v_1 \, v_2 \rightarrow v_2$$
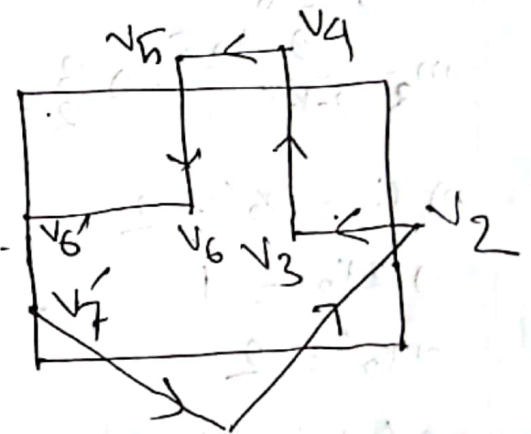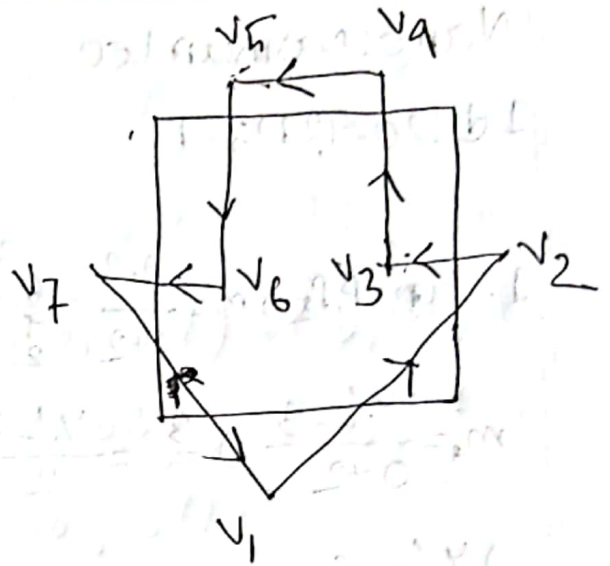$$v_2 \, v_3 \rightarrow v_3$$
$$v_3 \, v_4 \rightarrow v_4$$
$$v_4 \, v_5 \rightarrow v_5$$
$$v_5 \, v_6 \rightarrow v_6$$
$$v_6 \, v_7 \rightarrow v_6'$$
$$v_7 \, v_1 \rightarrow v_7' \, v_1$$

Right clip:

$$v_1 \, v_2 \rightarrow v_1'$$
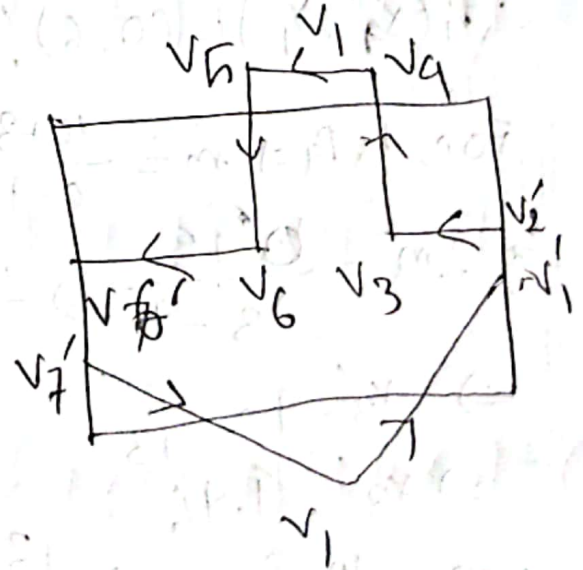$$v_2 \, v_3 \rightarrow v_2' \, v_3$$
$$v_3 \, v_4 \rightarrow v_4$$
$$v_4 \, v_5 \rightarrow v_5$$
$$v_5 \, v_6 \rightarrow v_6$$
$$v_6 \, v_6' \rightarrow v_6'$$
$$v_7' \, v_1 \rightarrow v_7' \, v_1$$

Top Clip:

$V_1 V_2' \rightarrow V_1'$

$V_2' V_3 \rightarrow V_2' V_3$
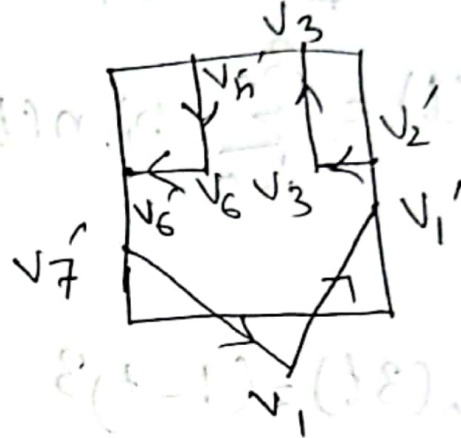
$V_3 V_4 \rightarrow V_3'$

$V_4 V_5 \rightarrow Null$

$V_5 V_6 \rightarrow V_5' V_6$

$V_6 V_6' \rightarrow V_6'$

$V_7' V_1 \rightarrow V_7' V_1$
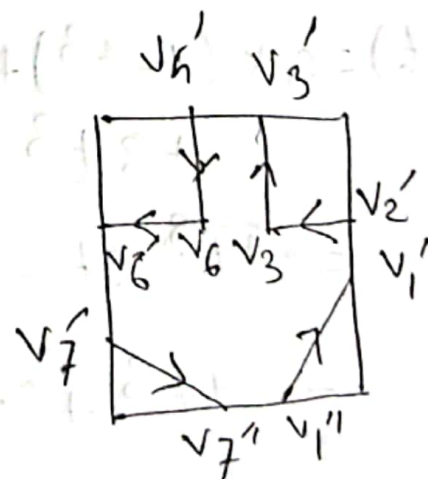
Bottom Clip:

$V_1 V_1'' \rightarrow V_1'' V_1'$

$V_2' V_3 \rightarrow V_2' V_3$

$V_3 V_3' \rightarrow V_3'$

$V_5' V_6 \rightarrow V_6$

$V_6 V_6' \rightarrow V_6'$

$V_7' V_1 \rightarrow V_7''$

3. $A(0,0)$, $B(2,10)$. $C(6,10)$, $D(8,14)$

$n=4-3=$ $n = 4-1 = 3$

$$B(t) = \sum_{i=0}^{3} b_{i,n}(t) \, P_i = P_0 b_{0,3}(t) + P_1 b_{1,3}(t) +$$

$$P_2 b_{2,3}(t) \quad P_2 b_{2,3}(t) +$$

$$P_3 b_{3,3}(t)$$

$b_{0,3}(t) = (1-t)^3$

$b_{1,3}(t) = 3t(1-t)^2$

$b_{2,3}(t) = 3t^2(1-t)$

$b_{3,3}(t) = t^3$

$$X(t) = 0 \times (1-t^3) + 2 \times 3t(1-t^2) + 6 \times 3t^2(1-t)$$
$$+ 8t^3$$

$$= \; 6t - 12t^2 + 6t^3 + 8t^2 - 18t^3 + 8t^3$$

$$= -4t^3 + 6t^2 + 6t$$

$$Y(t) = 0 \times (1-t^3) + 10 \times 3t \times (1-t)^2 + 10 \times 3t^2(1-t)$$
$$+ 14t^3$$

$$= 30t - 60t^2 + 30t^3 + 30t^2 - 30t^3 + 14t^3$$

$$= 14t^3 - 30t^2 + 30t$$

t	$x(t)$	$y(t)$
0	0	0
0.1	0.656	2.719
6.2	1.9	9.91
0.4	3.10	8.10
0.6	4.90	10.22
0.8	6.59	11.97
1	8	14