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CLASS:- BITECH III, Computer Eng.

SEM:- Semester 6

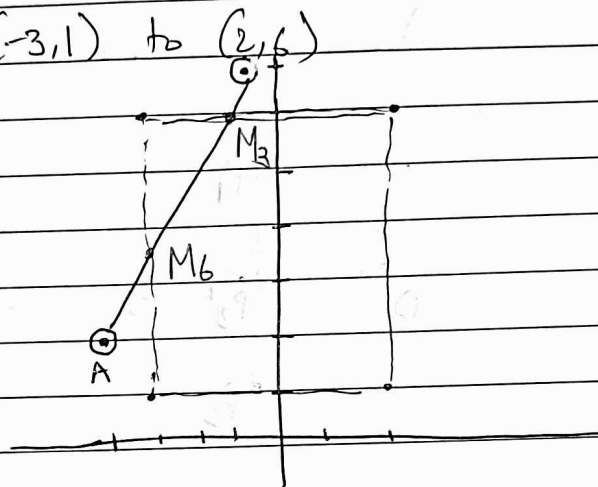
Computer Graphics

Tutorial 6

Ans 1: Given,
Window Size $(-3, 1)$ to $(2, 6)$

A $(-4, 2)$

B $(-1, 7)$



Find midpoint of AB $M_1 = (-5/2, 9/2) = (-2, 4)$

Find Midpoint of M_1 & B $M_2 = (-3/2, 11/2) = (-1, 5)$

Now M_2 is still inside window, find midpoint of M_2 & B, $M_3 = (-1, 6)$
 M_3 is the clipped point on the side of B.

Find midpoint of AM_3 , $M_4 = (-2, 4)$

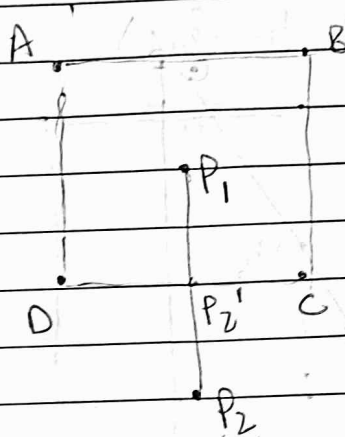
Again find midpoint of AM_4 , $M_5 = (-3, 3)$

Again find midpoint of AM_5 , $M_6 = (-3, 2)$

Hence, M_6 is the clipped point.

Hence line is M_6M_3 .

Ans 2; Given,
 $A(10, 20)$
 $B(20, 20)$
 $C(20, 10)$
 $D(10, 10)$
 $P_1(15, 15)$
 $P_2(15, 5)$



Here, $P_1 = 0000$
 $P_2 = 0100$

ORing them ~~then~~ $\rightarrow 0100$ (line is not completely inside)
 ANDing them $\rightarrow 0000$ (line is not completely outside)
 Hence it requires clipping.

Now it lies in 0100.

So, we need to use equation of line $X=15$.

And using line CD, $Y=10$,

We get the clipped point $(15, 10)$.

Hence

P_1P_2' is clipped line.

Q.3: Given,

$$x_{\min} = 20$$

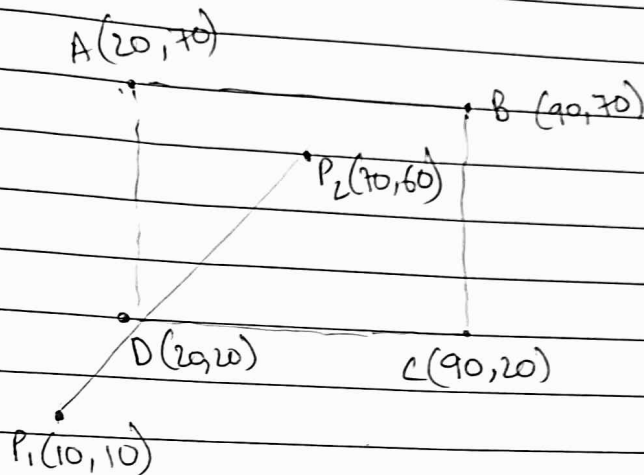
$$y_{\min} = 20$$

$$x_{\max} = 90$$

$$y_{\max} = 70$$

$$P_1(10, 10)$$

$$P_2(70, 60)$$



Here, $P_1 = 0110$

$P_2 = (0000)$

ORing them $\rightarrow 0110$ (line is not completely inside)

ANDing them $\rightarrow 0000$ (line is not completely outside)

Hence,

line needs to be clipped.

Here, let us find its intersection points with AD and CD.

Here, equation of line is:-

$$y - 10 = \frac{5}{6}(x - 10)$$

Put $y = 20$,

$$x = \frac{10 \times 6 + 10}{5} = 22.$$

Hence, $(22, 20) = (0000)$

Hence, line is clipped at $P_1'(22, 20)$.