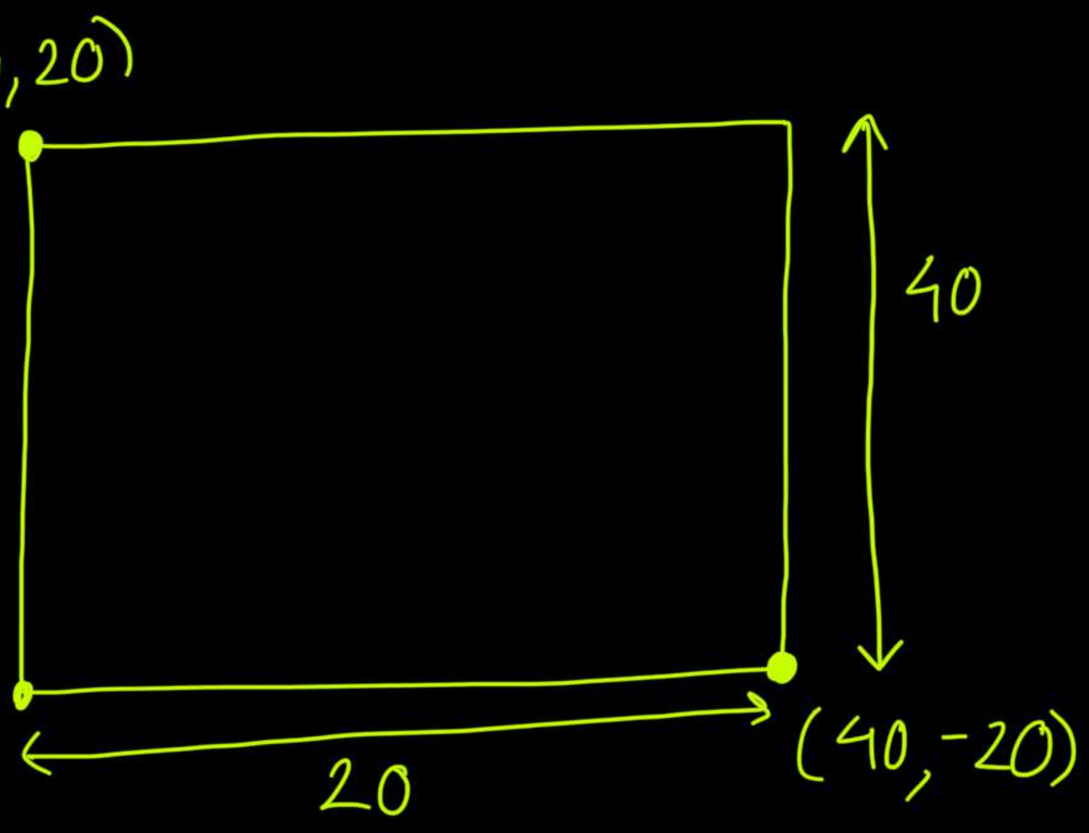
1).



$x_{min} = 20$ $x_{max} = 40$

$y_{min} = -20$ $y_{max} = 20$

$D = (-15, 40)$

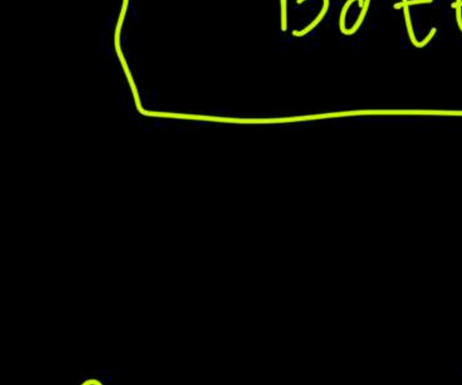
Boundary	Ni.D		t	tE	tL
Left	15	PL	$\frac{-(5-20)}{-15} = -1$	0	-1
Right	-15	PE	$\frac{-(5-40)}{-15} = -2.33$	0	-1
Top	40	PL	$\frac{-(-30-20)}{40} = 1.25$	0	-1
Bottam	-40	PE	$\frac{-(-30+20)}{40} = 0.25$	0.25	-1

$tE > tL \rightarrow$ Rejected

2i) After translating & rotating, the line aligns with the x-axis.

ii) Yes, since lines are preserved.

iii)



$b = -\sqrt{3}$

$\theta = 60°$

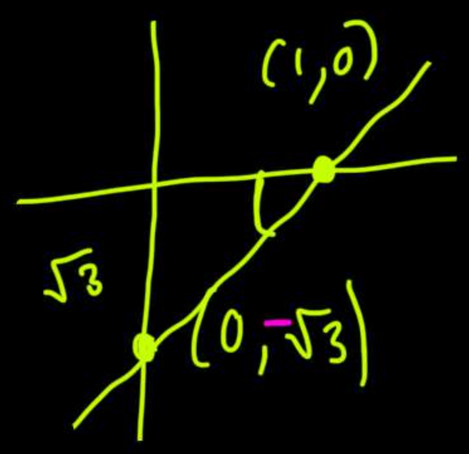
			$= -2.33$		
Top	40	PL	$\frac{-(-30-20)}{40}$ $= 1.25$	0	-1
Bottom	-40	PF	$\frac{-(-30+20)}{40}$ $= 0.25$	0.25	-1

$tE > tL \rightarrow$ Rejected

2i) After translating & rotating, the line aligns with the x-axis.

ii) Yes, since lines are preserved.

iii)



$b = -\sqrt{3}$

$\theta = 60°$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & -\sqrt{3} \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} \cos 60 & -\sin 60 & 0 \\ \sin 60 & \cos 60 & 0 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} \cos -60 & -\sin -60 & 0 \\ \sin -60 & \cos -60 & 0 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & \sqrt{3} \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 5 \\ 5 \\ 1 \end{bmatrix}$$

Q) Scaling → Angle Rotation → Angle / Distance

Q) $$\begin{bmatrix} 1 & 0 & 5 \\ 0 & 1 & 5 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 1/5 & 0 & 0 \\ 0 & 1/5 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & -5 \\ 0 & 1 & -5 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 1 & 0 & 7 \\ 0 & 1 & 10 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 1 & 0 & -3 \\ 0 & 1 & -4 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \cos 90 & -\sin 90 & 0 \\ \sin 90 & \cos 90 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 3 \\ 0 & 1 & 4 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 2 \\ 9 \\ 1 \end{bmatrix}$$