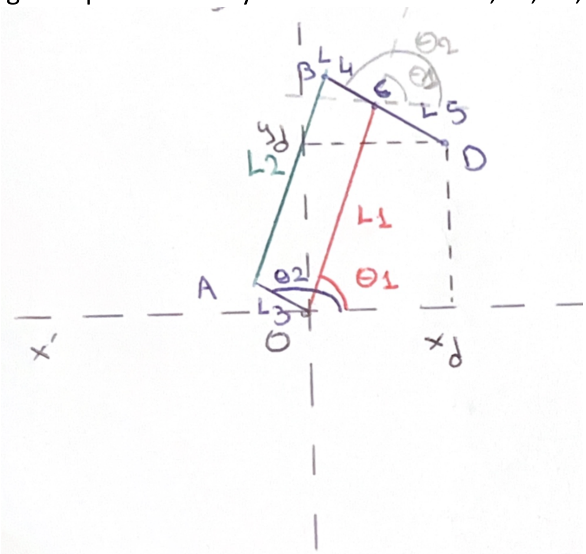
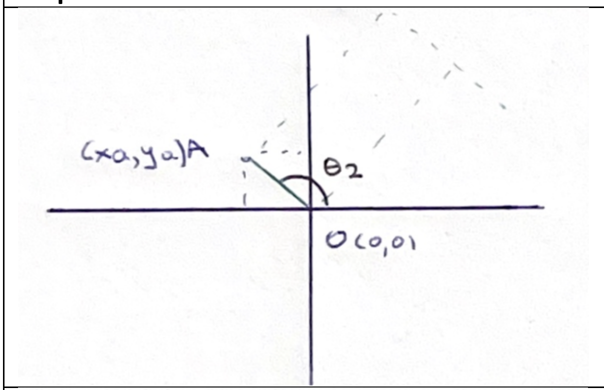
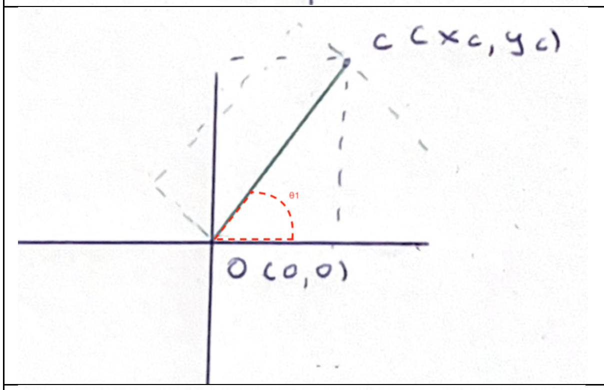
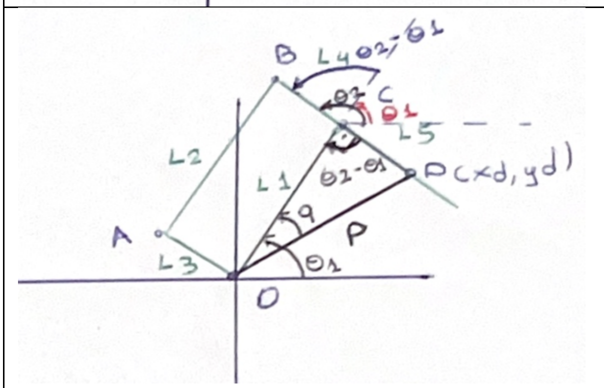
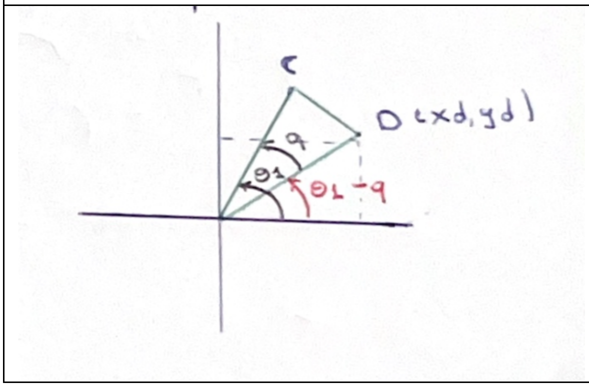
We know that $L1 = L2$ and $L3 = L4$, as well as $L1$ || L2 and L3 || L4. θ1 and θ2 can rotate around O (0,0) independently while respecting the following condition $0 \leq \theta 1 + \theta 2 \leq 180$. We are searching to express xd and yd in relation with L1, L2, θ1, θ2, etc.



<table>
<tr><th>Step</th><th>Analysis</th></tr>
<tr><td>
</td><td>$$\theta 2 = \arctan\left(\frac{ya}{xa}\right)$$
car
$$\tan(\theta) = \frac{y}{x}$$</td></tr>
<tr><td>
</td><td>$$\theta 1 = \arctan\left(\frac{yc}{xc}\right)$$</td></tr>
<tr><td>
</td><td>From cosinus lema we have:
$$p^2 = L1^2 + L5^2 - 2\,L1\,L2\cos(\theta 2 - \theta 1)$$
so
$$p = \sqrt{L1^2 + L5^2 - 2\,L1\,L2\cos(\theta 2 - \theta 1)}$$
and from sinus lema we have:
$$\frac{\sin(q)}{L5} = \frac{\sin(\theta 2 - \theta 1)}{p} \Leftrightarrow \sin(q) = \frac{L5}{p}\sin(\theta 2 - \theta 1)$$</td></tr>
</table>

	$xd = p \;\; cos(\theta 1 - q)$ $yd = p \;\; sin(\theta 1 - q)$

so by replacing q and p from previous step we take:

$$xd = \sqrt{L1^2 + L5^2 - 2\, L1\, L2 \cos(\theta 2 - \theta 1)}\ \cos\,(\theta 1 - \arcsin(\frac{L5}{\sqrt{L1^2 + L5^2 - 2\, L1\, L2 \cos(\theta 2 - \theta 1)}} \sin\,(\theta 2 - \theta 1))$$

and

$$yd = \sqrt{L1^2 + L5^2 - 2\, L1\, L2 \cos(\theta 2 - \theta 1)}\ \sin\,(\theta 1 - \arcsin(\frac{L5}{\sqrt{L1^2 + L5^2 - 2\, L1\, L2 \cos(\theta 2 - \theta 1)}} \sin\,(\theta 2 - \theta 1))$$