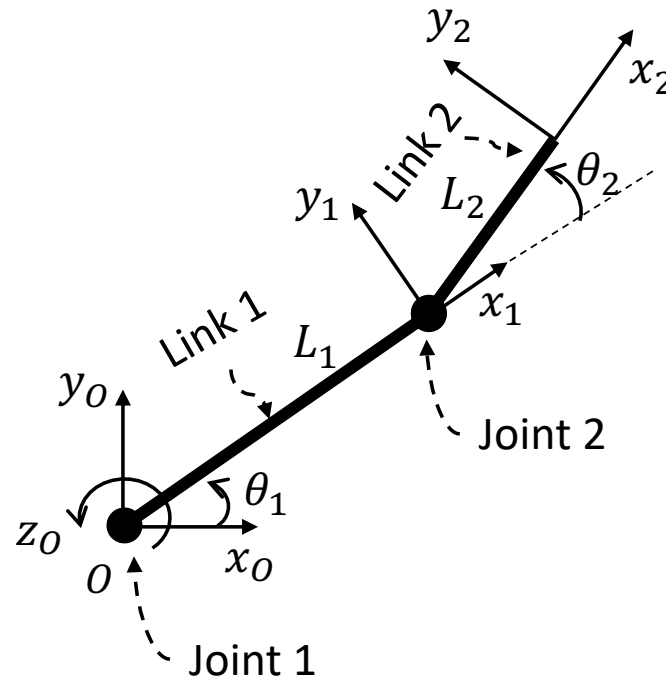


# H.W. #3

❖ **Submit a pdf file via email by next Monday 6 p.m.**

1. There is a 2-link planar manipulator.

- 1) Draw reachable workspace when  $L_1 > L_2$ ,  $0 \leq \theta_1 \leq 180^\circ$  and  $-90^\circ \leq \theta_2 \leq 90^\circ$ .
- 2) Given a position of the manipulator's tip as  $(p_x, p_y)$ , find a solution using a geometric method.  
(hint: Apply the "law of cosines")



# H.W. #3

2. In “Fwd\_Kine.nxc” used during Lab #2, add an algorithm to restrict joint angles. For example, if joint angles meet the limits while increasing them, keep the limited angles regardless of increasing joint angles.

- Here are joint angle limits,  $0 \leq \theta_1 \leq 180^\circ$  and  $-90^\circ \leq \theta_2 \leq 90^\circ$ .
- A video clip should include increasing joint angles in a NXT LCD.
- **Submit a source code with a video clip link like a youtube link or cloud link, or a compressed video clip file.**