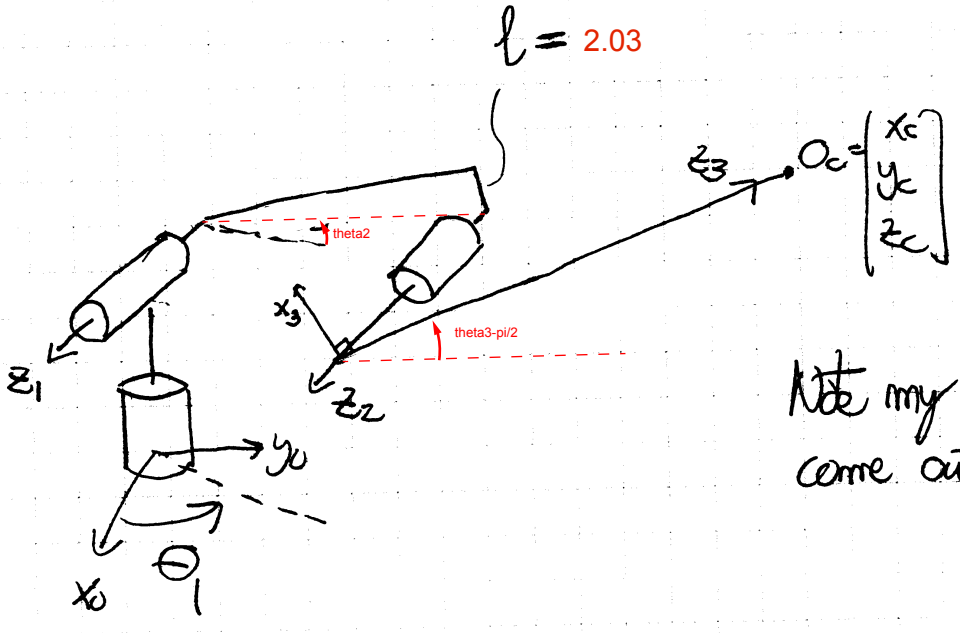
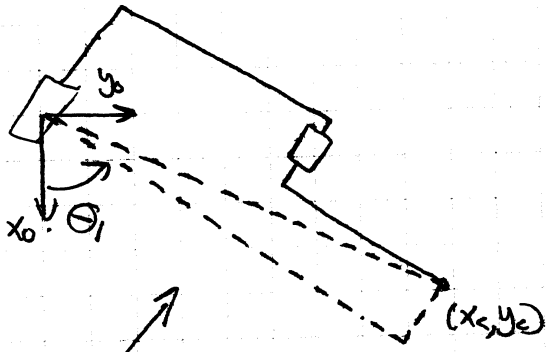
Schematic Representation of PUMA 560 robot.

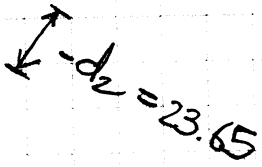


Note my convention: z_1, z_2 axes come out of the page.

Find Θ_1 by viewing robot from the top (i.e; look down the z_0 axis)

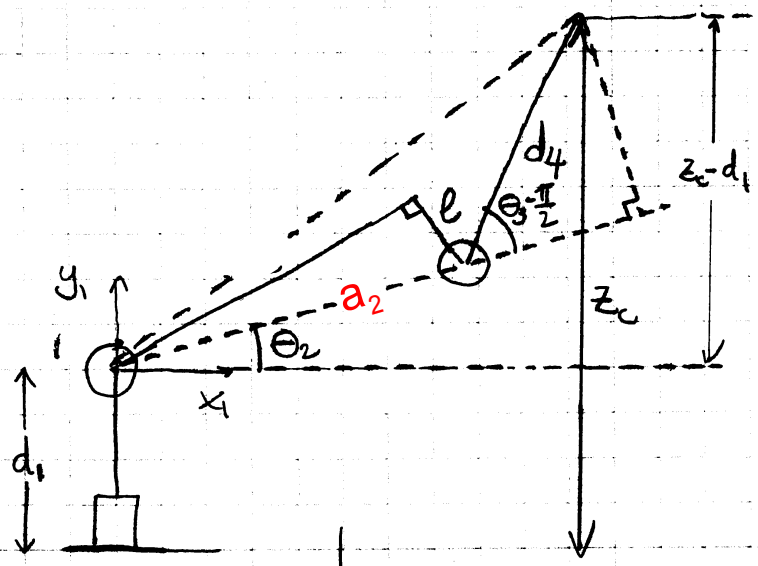


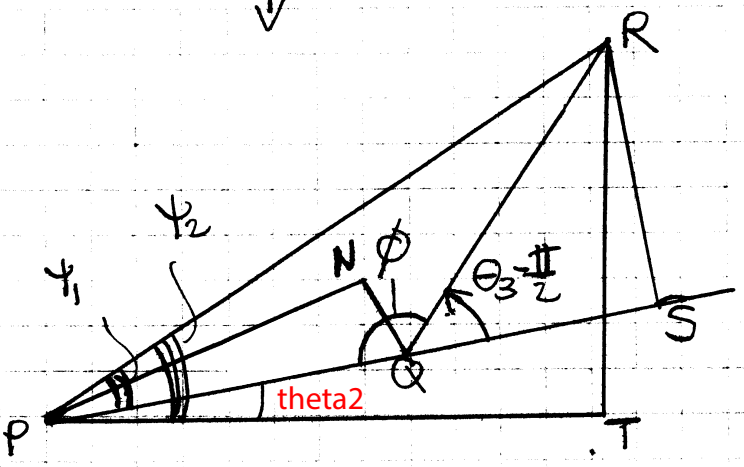
Using the dashed triangle, you should be able to find Θ_1 as the difference between two angles.



View from the side (next page)

Find θ_2, θ_3 from the side view of the robot, obtained by looking down the z_1, z_2 axes. It turns out that this view lies on the $x_1 - y_1$ plane





Note: $\overline{RT} = z_c - d_1$

$\overline{PT} = \sqrt{x_c^2 + y_c^2 - d_2^2}$,

$\overline{PR} = \sqrt{(z_c - d_1)^2 + x_c^2 + y_c^2 - d_2^2}$

$\overline{PQ} = a_2$

; $\overline{QR} = d_4$

Note: d_i, & a_i are DH parameters. You have to find these based on the robot measurements provided

1) Apply law of cosines to triangle PQR to find angle ϕ. Deduce angle θ_3.

2) Use triangle RPS to find angle ψ_1

3) Use triangle RPT to find angle ψ_2

4) Note that theta2 = Psi2 - Psi1