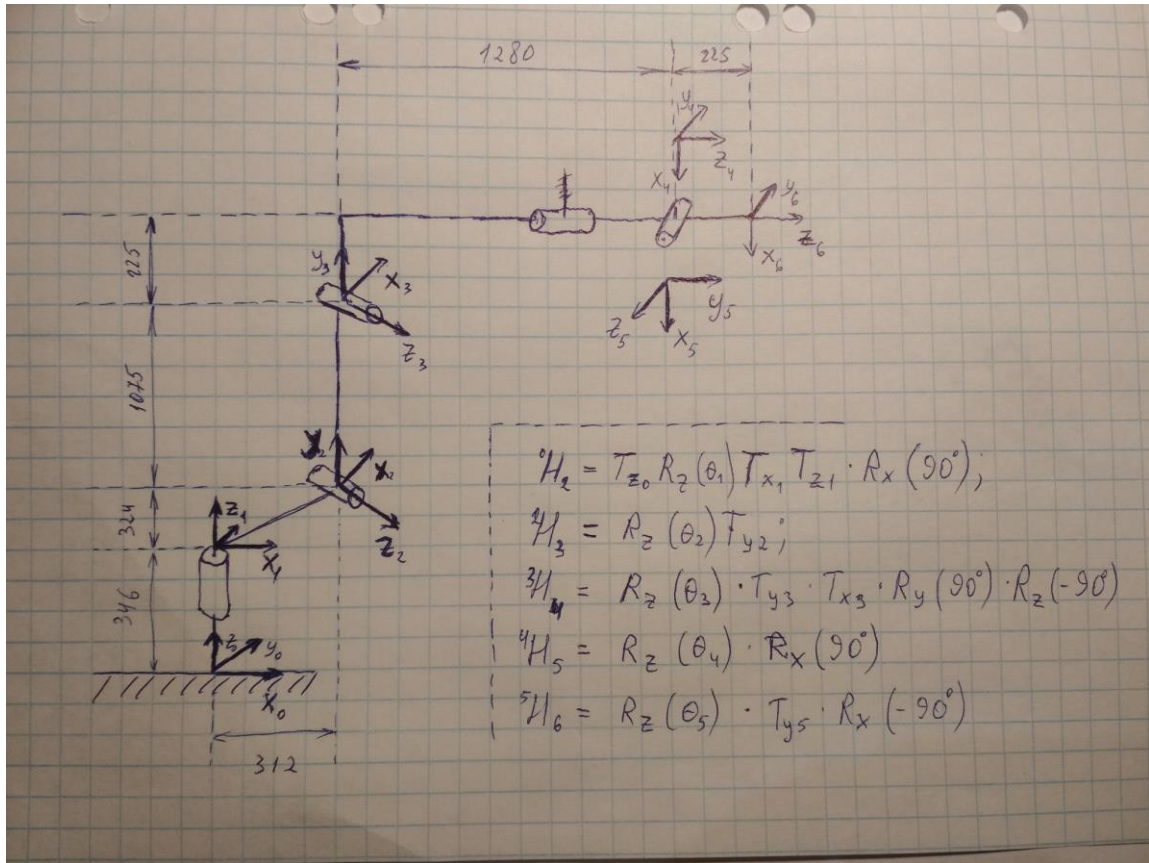


Osipov Alexander

Homework1

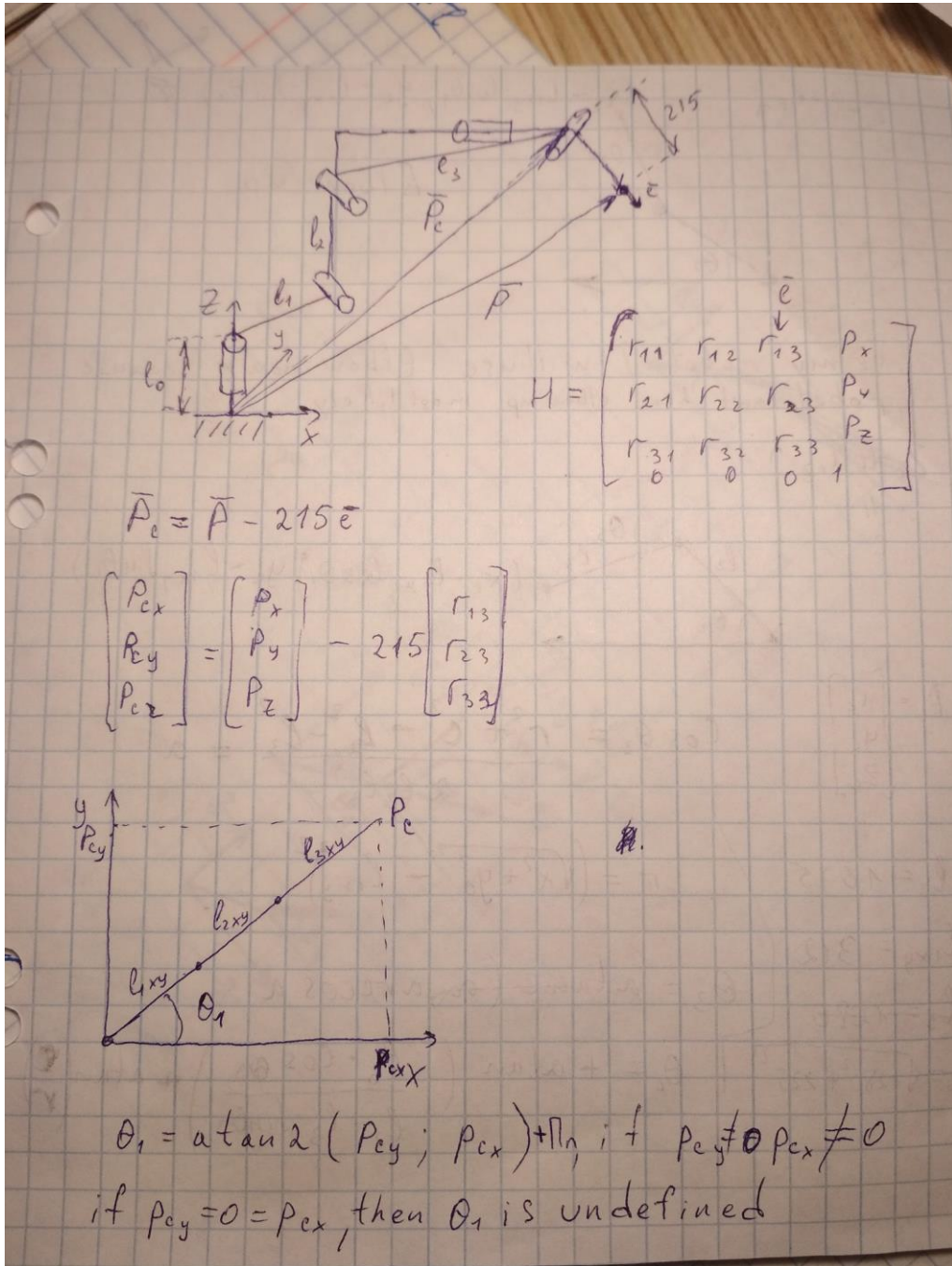
a) Forward kinematic problem for robot R 2000ic -165f

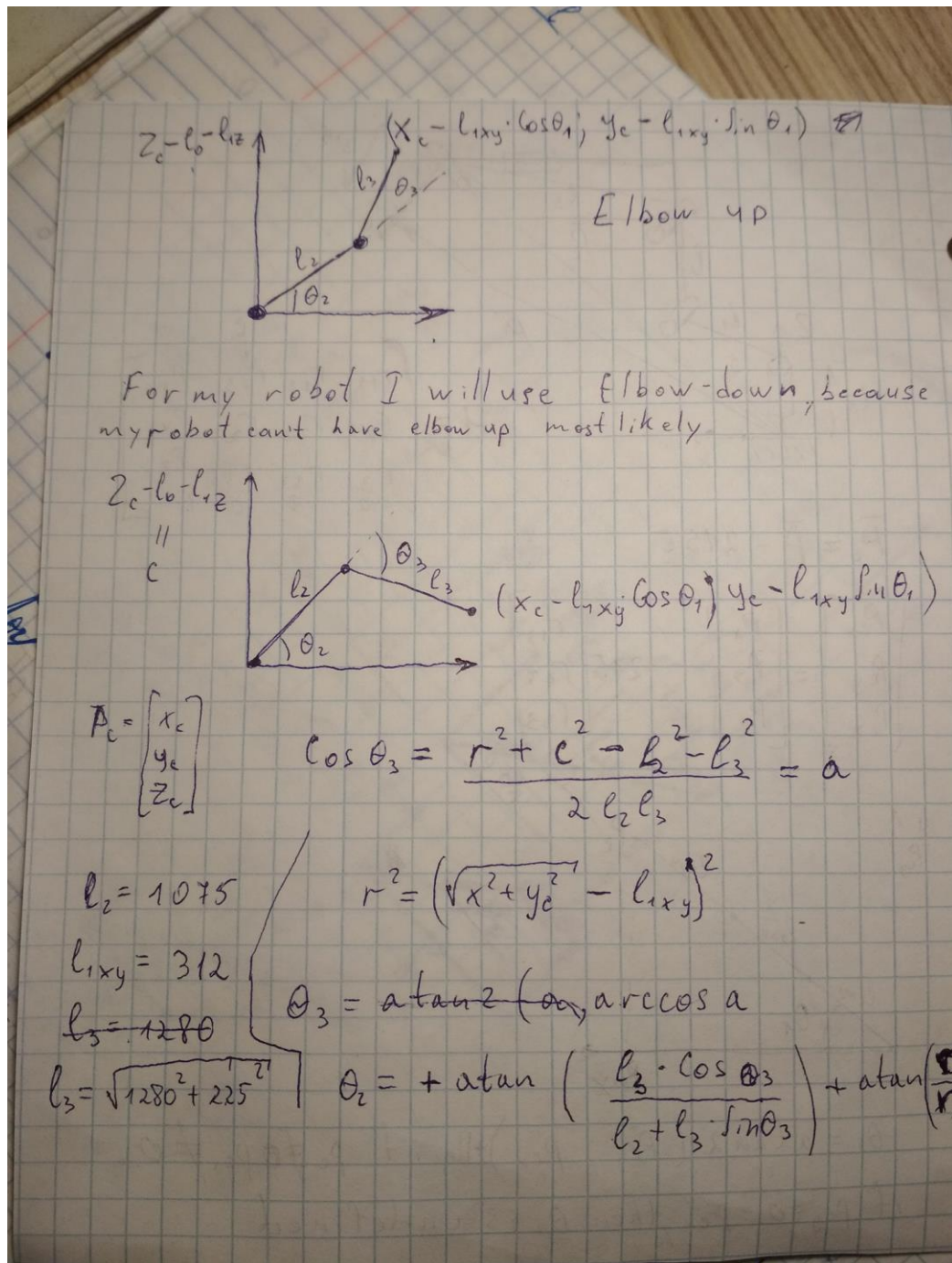
Scheme



In forward kinematic problem we can find position of end-effector using angles of joints and T-transformation matrix. I solved this problem in matlab. I used 5 joints. Also I used position of joint6 as end-effector. File name "robot_FK.m" is example of forward kinematic. File name "forward_k.m" is function of forward kinematic which uses additional function "Rotx.m", "Roty.m", "Rotz.m".

b) Inverse kinematic problem





After application above we know theta 1, theta 2 theta 3 with respect of coordinates of end-effector.

So we can find OH3 using theta 1, theta 2 theta 3. So we will know OR3 from OH3. Then we can find 3R5 = inverse(OR3) * OR5, where OR5 from OH5. So we will have a matrix 3R5 with theta 4 and theta 5. Due to 3R5 we can find theta 4 and theta 5. For check I used H1 and H2 from previous task (forward kinematic). File name "robot_IK.m" is example of inverse kinematic. File name "inverse_k.m" is function of inverse kinematic which uses additional function "Rotx.m", "Roty.m", "Rotz.m".

In result my algorithm works quite successfully.