FENIL DESAT RBE 500 -HOME WORK3 wereby $S(a) p = a \times p$ Q $a \neq p \in p^3$ $a = [q_1 \ q_2 \ q_3]^T \qquad \emptyset \quad p = [p_1 \ p_2 \ p_3]^T$ $S(a) = \begin{bmatrix} 0 & -a_3 & a_2 \\ a_3 & 0 & -a_1 \\ -a_2 & q_1 & 0 \end{bmatrix}$ 4.2 S(a) P= 0 -93 92 93 0 -91 PZ $= \begin{cases} -q_3 \beta_2 + q_2 \beta_3 \\ \rho_1 q_3 & -q_1 \beta_3 \\ -q_2 \beta_1 + \beta_2 q_1 \end{cases}$ QXP = 1 (92 P3 - P2 93) (- (91 P3 - P393)) + (92 P2 -P3 92) K 9xP= (9283-1293) 1993-9283 9282-1382 -> force, we can see that scap = axp

•• RE SO(3), we can defely state that -

$$41 \times 92 = 92$$
 $91 \times 92 = 92$
 $12 \times 92 = 92$
 $12 \times 92 = 92$

Read Part = [(92 b2 - 93 b2) 91 (93 b1 - 21 b3) 92

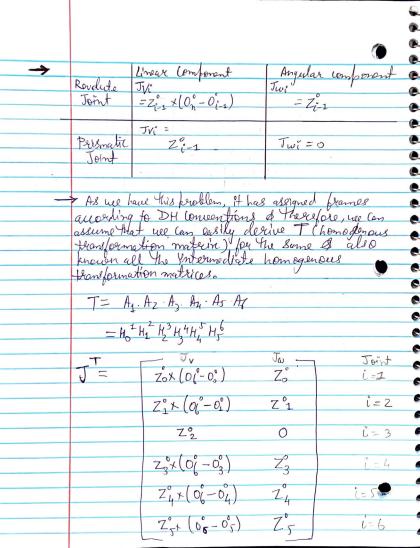
[92 b2 - 22 b4) 93

= R (2 \times b)

= R (2 \times

$$R(S(a))R^{T} \Rightarrow R(S(a))R^{T} \Rightarrow R(S($$

RS(a) RT= S(Ra)



Zo -> Zanto of the frame o: [0 0 1] $Z_1^0 \rightarrow Z_{anls} of H_1^0 \rightarrow R_1^0 [001]^T$ Z° > Zands of 4° [4] R° [001] Z3 -> Zends of H3 -> R3 [00] T (A1A,A3) Z4 -> Zendy of H4 (A1A,A,A4) -> R4 (001] Zo -> Fands of Ho (Ag Az Az Ag Ag) > Ro [001] i T= R t] 00 = E $\frac{O_0^{\circ \circ} = \left[\begin{array}{ccc} 0 & 0 & 0 \end{array} \right]}{H_1^{\circ} = \left[\begin{array}{ccc} P_1^{\circ} & t_1 \\ 1 & 1 \end{array} \right]} \rightarrow \left[\begin{array}{ccc} t_1^{\circ} = O_1^{\circ} \end{array} \right]$ $H_2^0 = \begin{bmatrix} R_2^0 & t_2^0 \\ t_2^0 \end{bmatrix} \rightarrow \begin{bmatrix} 0_2^0 & = t_2^0 \end{bmatrix}$ $H_3^{\circ} = \begin{bmatrix} R_3^{\circ} & \xi_3^{\circ} \\ \vdots & \vdots \\ \vdots & \vdots \end{bmatrix} \rightarrow \begin{bmatrix} O_3^{\circ} = \xi_3^{\circ} \end{bmatrix}$ H, 0 = (P, 0 t, 0) -> (D, 0 = t, 0) Hro= Pro to -> 00 = fo

→ ROS Assignment -→ Jam sykmiting "forward_klnomatics" package as a falt of HW3.

→ rosiore

→ To run the Subscriber USE → rosrum forward Knomatics forward knomatics -> In a new terminal publish values of 21, 22 d 23 Rostopic pub FK topic forward knomatics/joint_variable where XX is a joint veryable in dogress. 7 Jave Calculated his forward Kinematics considering the link lengths (L1 & L2 & 23) to be 1.0 m.