t\_1 =

- f\_y\*(l2\*cos(j1 - (3\*pi)/2) + cos(pi/2 - j1 + asin((sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) + acos((l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(2\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2))))\*(l3 + l6)\*(((cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2) - (l2\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2))/(- (sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)) + 1)^(1/2) - (l2\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + l2^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) - l3^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + l4^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + l5^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) - 2\*l1^2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) - 2\*l2\*l5^2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) - 2\*l1\*l5\*cos(j2 - (3\*pi)/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + 4\*l1\*l2\*l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*cos(j2 - (3\*pi)/2)))/(2\*l3\*(- (l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^2/(4\*l3^2\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) + 1)^(1/2)\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2)) + 1)) - f\_x\*(l2\*sin(j1 - (3\*pi)/2) - sin(pi/2 - j1 + asin((sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) + acos((l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(2\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2))))\*(l3 + l6)\*(((cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2) - (l2\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2))/(- (sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)) + 1)^(1/2) - (l2\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + l2^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) - l3^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + l4^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + l5^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) - 2\*l1^2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) - 2\*l2\*l5^2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) - 2\*l1\*l5\*cos(j2 - (3\*pi)/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + 4\*l1\*l2\*l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*cos(j2 - (3\*pi)/2)))/(2\*l3\*(- (l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^2/(4\*l3^2\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) + 1)^(1/2)\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2)) + 1))

t\_2 =

f\_y\*cos(pi/2 - j1 + asin((sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) + acos((l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(2\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2))))\*(l3 + l6)\*(((l1\*l5\*sin(j2 - (3\*pi)/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/((l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) - (sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)\*(2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))))/(2\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2)) + (l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)))/(- (sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)) + 1)^(1/2) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)))/(2\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)))\*(l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))/(4\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2)))/(- (l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^2/(4\*l3^2\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) + 1)^(1/2)) - f\_x\*sin(pi/2 - j1 + asin((sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) + acos((l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))/(2\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2))))\*(l3 + l6)\*(((l1\*l5\*sin(j2 - (3\*pi)/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/((l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) - (sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)\*(2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))))/(2\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2)) + (l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)))/(- (sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))^2\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))/(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)) + 1)^(1/2) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)))/(2\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(1/2)) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(((l1 - l5\*cos(j2 - (3\*pi)/2))^2/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2))^(1/2)\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)))\*(l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))/(4\*l3\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^(3/2)))/(- (l1^2 + l2^2 + l3^2 - l4^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))^2/(4\*l3^2\*(l1^2 + l2^2 + l5^2 - 2\*l1\*l5\*cos(j2 - (3\*pi)/2) - 2\*l2\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2)))\*(l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2)^(1/2))) + 1)^(1/2))

s1 =

l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2

RS1 =

- f\_y\*(l2\*cos(j1 - (3\*pi)/2) + cos(pi/2 - j1 + asin((s1^(1/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(1/2)) + acos((s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))/(2\*l3\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(1/2))))\*(l3 + l6)\*(((s1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(1/2) - (l2\*s1\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(3/2))/(- (s1\*sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))) + 1)^(1/2) - (l2\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))\*(l1^2\*s1^(1/2) + l2^2\*s1^(1/2) - l3^2\*s1^(1/2) + l4^2\*s1^(1/2) + l5^2\*s1^(1/2) - 2\*l1^2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))) - 2\*l2\*l5^2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))) - 2\*l1\*l5\*s1^(1/2)\*cos(j2 - (3\*pi)/2) + 4\*l1\*l2\*l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))\*cos(j2 - (3\*pi)/2)))/(2\*l3\*(- (s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^2/(4\*l3^2\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))) + 1)^(1/2)\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(3/2)) + 1)) - f\_x\*(l2\*sin(j1 - (3\*pi)/2) - sin(pi/2 - j1 + asin((s1^(1/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(1/2)) + acos((s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))/(2\*l3\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(1/2))))\*(l3 + l6)\*(((s1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(1/2) - (l2\*s1\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(3/2))/(- (s1\*sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))) + 1)^(1/2) - (l2\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))\*(l1^2\*s1^(1/2) + l2^2\*s1^(1/2) - l3^2\*s1^(1/2) + l4^2\*s1^(1/2) + l5^2\*s1^(1/2) - 2\*l1^2\*l2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))) - 2\*l2\*l5^2\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))) - 2\*l1\*l5\*s1^(1/2)\*cos(j2 - (3\*pi)/2) + 4\*l1\*l2\*l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2)))\*cos(j2 - (3\*pi)/2)))/(2\*l3\*(- (s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^2/(4\*l3^2\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))) + 1)^(1/2)\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))))^(3/2)) + 1))

s2 =

(3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/s1^(1/2))

RS2 =

- f\_y\*(l2\*cos(j1 - (3\*pi)/2) + cos(pi/2 - j1 + acos((s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos(s2))/(2\*l3\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(1/2))) + asin((s1^(1/2)\*sin(s2))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(1/2)))\*(l3 + l6)\*(((s1^(1/2)\*cos(s2))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(1/2) - (l2\*s1\*sin(s2)^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(3/2))/(1 - (s1\*sin(s2)^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2)))^(1/2) - (l2\*sin(s2)\*(l1^2\*s1^(1/2) + l2^2\*s1^(1/2) - l3^2\*s1^(1/2) + l4^2\*s1^(1/2) + l5^2\*s1^(1/2) - 2\*l1^2\*l2\*cos(s2) - 2\*l2\*l5^2\*cos(s2) - 2\*l1\*l5\*s1^(1/2)\*cos(j2 - (3\*pi)/2) + 4\*l1\*l2\*l5\*cos(s2)\*cos(j2 - (3\*pi)/2)))/(2\*l3\*(1 - (s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos(s2))^2/(4\*l3^2\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))))^(1/2)\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(3/2)) + 1)) - f\_x\*(l2\*sin(j1 - (3\*pi)/2) - sin(pi/2 - j1 + acos((s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos(s2))/(2\*l3\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(1/2))) + asin((s1^(1/2)\*sin(s2))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(1/2)))\*(l3 + l6)\*(((s1^(1/2)\*cos(s2))/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(1/2) - (l2\*s1\*sin(s2)^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(3/2))/(1 - (s1\*sin(s2)^2)/(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2)))^(1/2) - (l2\*sin(s2)\*(l1^2\*s1^(1/2) + l2^2\*s1^(1/2) - l3^2\*s1^(1/2) + l4^2\*s1^(1/2) + l5^2\*s1^(1/2) - 2\*l1^2\*l2\*cos(s2) - 2\*l2\*l5^2\*cos(s2) - 2\*l1\*l5\*s1^(1/2)\*cos(j2 - (3\*pi)/2) + 4\*l1\*l2\*l5\*cos(s2)\*cos(j2 - (3\*pi)/2)))/(2\*l3\*(1 - (s1 + l2^2 + l3^2 - l4^2 - 2\*l2\*s1^(1/2)\*cos(s2))^2/(4\*l3^2\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))))^(1/2)\*(s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2))^(3/2)) + 1))

s3 =

s1 + l2^2 - 2\*l2\*s1^(1/2)\*cos(s2)

RS3 =

- f\_y\*(l2\*cos(j1 - (3\*pi)/2) + cos(pi/2 - j1 + acos((l3^2 - l4^2 + s3)/(2\*l3\*s3^(1/2))) + asin((s1^(1/2)\*sin(s2))/s3^(1/2)))\*(l3 + l6)\*(((s1^(1/2)\*cos(s2))/s3^(1/2) - (l2\*s1\*sin(s2)^2)/s3^(3/2))/(1 - (s1\*sin(s2)^2)/s3)^(1/2) - (l2\*sin(s2)\*(l1^2\*s1^(1/2) + l2^2\*s1^(1/2) - l3^2\*s1^(1/2) + l4^2\*s1^(1/2) + l5^2\*s1^(1/2) - 2\*l1^2\*l2\*cos(s2) - 2\*l2\*l5^2\*cos(s2) - 2\*l1\*l5\*s1^(1/2)\*cos(j2 - (3\*pi)/2) + 4\*l1\*l2\*l5\*cos(s2)\*cos(j2 - (3\*pi)/2)))/(2\*l3\*s3^(3/2)\*(1 - (l3^2 - l4^2 + s3)^2/(4\*l3^2\*s3))^(1/2)) + 1)) - f\_x\*(l2\*sin(j1 - (3\*pi)/2) - sin(pi/2 - j1 + acos((l3^2 - l4^2 + s3)/(2\*l3\*s3^(1/2))) + asin((s1^(1/2)\*sin(s2))/s3^(1/2)))\*(l3 + l6)\*(((s1^(1/2)\*cos(s2))/s3^(1/2) - (l2\*s1\*sin(s2)^2)/s3^(3/2))/(1 - (s1\*sin(s2)^2)/s3)^(1/2) - (l2\*sin(s2)\*(l1^2\*s1^(1/2) + l2^2\*s1^(1/2) - l3^2\*s1^(1/2) + l4^2\*s1^(1/2) + l5^2\*s1^(1/2) - 2\*l1^2\*l2\*cos(s2) - 2\*l2\*l5^2\*cos(s2) - 2\*l1\*l5\*s1^(1/2)\*cos(j2 - (3\*pi)/2) + 4\*l1\*l2\*l5\*cos(s2)\*cos(j2 - (3\*pi)/2)))/(2\*l3\*s3^(3/2)\*(1 - (l3^2 - l4^2 + s3)^2/(4\*l3^2\*s3))^(1/2)) + 1))

s4 =

(l2\*sin(s2)\*(l1^2\*s1^(1/2) + l2^2\*s1^(1/2) - l3^2\*s1^(1/2) + l4^2\*s1^(1/2) + l5^2\*s1^(1/2) - 2\*l1^2\*l2\*cos(s2) - 2\*l2\*l5^2\*cos(s2) - 2\*l1\*l5\*s1^(1/2)\*cos(j2 - (3\*pi)/2) + 4\*l1\*l2\*l5\*cos(s2)\*cos(j2 - (3\*pi)/2)))/(2\*l3\*s3^(3/2)\*(1 - (l3^2 - l4^2 + s3)^2/(4\*l3^2\*s3))^(1/2))

RS4 =

- f\_y\*(l2\*cos(j1 - (3\*pi)/2) + cos(pi/2 - j1 + acos((l3^2 - l4^2 + s3)/(2\*l3\*s3^(1/2))) + asin((s1^(1/2)\*sin(s2))/s3^(1/2)))\*(l3 + l6)\*(((s1^(1/2)\*cos(s2))/s3^(1/2) - (l2\*s1\*sin(s2)^2)/s3^(3/2))/(1 - (s1\*sin(s2)^2)/s3)^(1/2) - s4 + 1)) - f\_x\*(l2\*sin(j1 - (3\*pi)/2) - sin(pi/2 - j1 + acos((l3^2 - l4^2 + s3)/(2\*l3\*s3^(1/2))) + asin((s1^(1/2)\*sin(s2))/s3^(1/2)))\*(l3 + l6)\*(((s1^(1/2)\*cos(s2))/s3^(1/2) - (l2\*s1\*sin(s2)^2)/s3^(3/2))/(1 - (s1\*sin(s2)^2)/s3)^(1/2) - s4 + 1))

s5 =

((s1^(1/2)\*cos(s2))/s3^(1/2) - (l2\*s1\*sin(s2)^2)/s3^(3/2))/(1 - (s1\*sin(s2)^2)/s3)^(1/2) - s4 + 1

RS5 =

- f\_y\*(l2\*cos(j1 - (3\*pi)/2) + s5\*cos(pi/2 - j1 + acos((l3^2 - l4^2 + s3)/(2\*l3\*s3^(1/2))) + asin((s1^(1/2)\*sin(s2))/s3^(1/2)))\*(l3 + l6)) - f\_x\*(l2\*sin(j1 - (3\*pi)/2) - s5\*sin(pi/2 - j1 + acos((l3^2 - l4^2 + s3)/(2\*l3\*s3^(1/2))) + asin((s1^(1/2)\*sin(s2))/s3^(1/2)))\*(l3 + l6))

s6 =

pi/2 - j1 + acos((l3^2 - l4^2 + s3)/(2\*l3\*s3^(1/2))) + asin((s1^(1/2)\*sin(s2))/s3^(1/2))

RS6 =

- f\_y\*(l2\*cos(j1 - (3\*pi)/2) + s5\*cos(s6)\*(l3 + l6)) - f\_x\*(l2\*sin(j1 - (3\*pi)/2) - s5\*sin(s6)\*(l3 + l6))

s7 =

j1 - (3\*pi)/2

RS7 =

- f\_y\*(l2\*cos(s7) + s5\*cos(s6)\*(l3 + l6)) - f\_x\*(l2\*sin(s7) - s5\*sin(s6)\*(l3 + l6))

s8 =

l3 + l6

RS8 =

- f\_x\*(l2\*sin(s7) - s5\*s8\*sin(s6)) - f\_y\*(l2\*cos(s7) + s5\*s8\*cos(s6))

v1 =

l1^2 - 2\*cos(j2 - (3\*pi)/2)\*l1\*l5 + l5^2

TS1 =

f\_x\*sin(pi/2 - j1 + asin((v1^(1/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)) + acos((v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2))))\*(((2\*l1\*l5\*sin(j2 - (3\*pi)/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/v1^(1/2))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/v1^(1/2))\*(v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))))/(4\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(3/2)))/(- (v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^2/(4\*l3^2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))) + 1)^(1/2) - ((l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)) - (v1^(1/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(2\*l1\*l5\*sin(j2 - (3\*pi)/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/v1^(1/2)))/(2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(3/2)) + (l1\*l5\*sin(j2 - (3\*pi)/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/(v1^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)))/(- (v1\*sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))^2)/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))) + 1)^(1/2))\*(l3 + l6) - f\_y\*cos(pi/2 - j1 + asin((v1^(1/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)) + acos((v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2))))\*(((2\*l1\*l5\*sin(j2 - (3\*pi)/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/v1^(1/2))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/v1^(1/2))\*(v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))))/(4\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(3/2)))/(- (v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^2/(4\*l3^2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))) + 1)^(1/2) - ((l5\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)) - (v1^(1/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(2\*l1\*l5\*sin(j2 - (3\*pi)/2) + (2\*l2\*l5\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/v1^(1/2)))/(2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(3/2)) + (l1\*l5\*sin(j2 - (3\*pi)/2)\*sin((3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))/(v1^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))))^(1/2)))/(- (v1\*sin(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))^2)/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(- j1 + (3\*pi)/2 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2)))) + 1)^(1/2))\*(l3 + l6)

v2 =

(3\*pi)/2 - j1 + asin((l5\*sin(j2 - (3\*pi)/2))/v1^(1/2))

TS2 =

f\_y\*cos(pi/2 - j1 + acos((v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2))) + asin((v1^(1/2)\*sin(v2))/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)))\*(l3 + l6)\*(((l1\*l5\*sin(j2 - (3\*pi)/2)\*sin(v2))/(v1^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)) - (v1^(1/2)\*sin(v2)\*(2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2))))/(2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(3/2)) + (l5\*cos(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)))/(1 - (v1\*sin(v2)^2)/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2)))^(1/2) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)))\*(v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2)))/(4\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(3/2)))/(1 - (v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))^2/(4\*l3^2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))))^(1/2)) - f\_x\*sin(pi/2 - j1 + acos((v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2))) + asin((v1^(1/2)\*sin(v2))/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)))\*(l3 + l6)\*(((l1\*l5\*sin(j2 - (3\*pi)/2)\*sin(v2))/(v1^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)) - (v1^(1/2)\*sin(v2)\*(2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2))))/(2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(3/2)) + (l5\*cos(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)))/(1 - (v1\*sin(v2)^2)/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2)))^(1/2) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)))\*(v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2)))/(4\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(3/2)))/(1 - (v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))^2/(4\*l3^2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))))^(1/2))

v3 =

((l1\*l5\*sin(j2 - (3\*pi)/2)\*sin(v2))/(v1^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)) - (v1^(1/2)\*sin(v2)\*(2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2))))/(2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(3/2)) + (l5\*cos(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)))/(1 - (v1\*sin(v2)^2)/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2)))^(1/2) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)) - ((2\*l1\*l5\*sin(j2 - (3\*pi)/2) - (2\*l1\*l2\*l5\*sin(j2 - (3\*pi)/2)\*cos(v2))/v1^(1/2) + (2\*l2\*l5\*sin(v2)\*(l1^2\*cos(j2 - (3\*pi)/2) + l5^2\*cos(j2 - (3\*pi)/2) - l1\*l5 - l1\*l5\*cos(j2 - (3\*pi)/2)^2))/(v1\*((l1 - l5\*cos(j2 - (3\*pi)/2))^2/v1)^(1/2)))\*(v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2)))/(4\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(3/2)))/(1 - (v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))^2/(4\*l3^2\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))))^(1/2)

TS3 =

f\_y\*v3\*cos(pi/2 - j1 + acos((v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2))) + asin((v1^(1/2)\*sin(v2))/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)))\*(l3 + l6) - f\_x\*v3\*sin(pi/2 - j1 + acos((v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2))) + asin((v1^(1/2)\*sin(v2))/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2)))\*(l3 + l6)

v4 =

pi/2 - j1 + acos((v1 + l2^2 + l3^2 - l4^2 - 2\*l2\*v1^(1/2)\*cos(v2))/(2\*l3\*(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2))) + asin((v1^(1/2)\*sin(v2))/(v1 + l2^2 - 2\*l2\*v1^(1/2)\*cos(v2))^(1/2))

TS4 =

f\_y\*v3\*cos(v4)\*(l3 + l6) - f\_x\*v3\*sin(v4)\*(l3 + l6)

v5 =

l3 + l6

TS5 =

f\_y\*v3\*v5\*cos(v4) - f\_x\*v3\*v5\*sin(v4)