Based upon the equations of the 2-link in the lecture slides on Differential Kinematics

<https://www.youtube.com/watch?time_continue=290&v=Q1UkviEb_28>

Expand this to the 3 link by including the and

Then as in that lecture, we use the Jacobian, to define the relationship between the end-effector velocity and the joint velocity,

See the accompanying Matlab code for the rest of the solution.