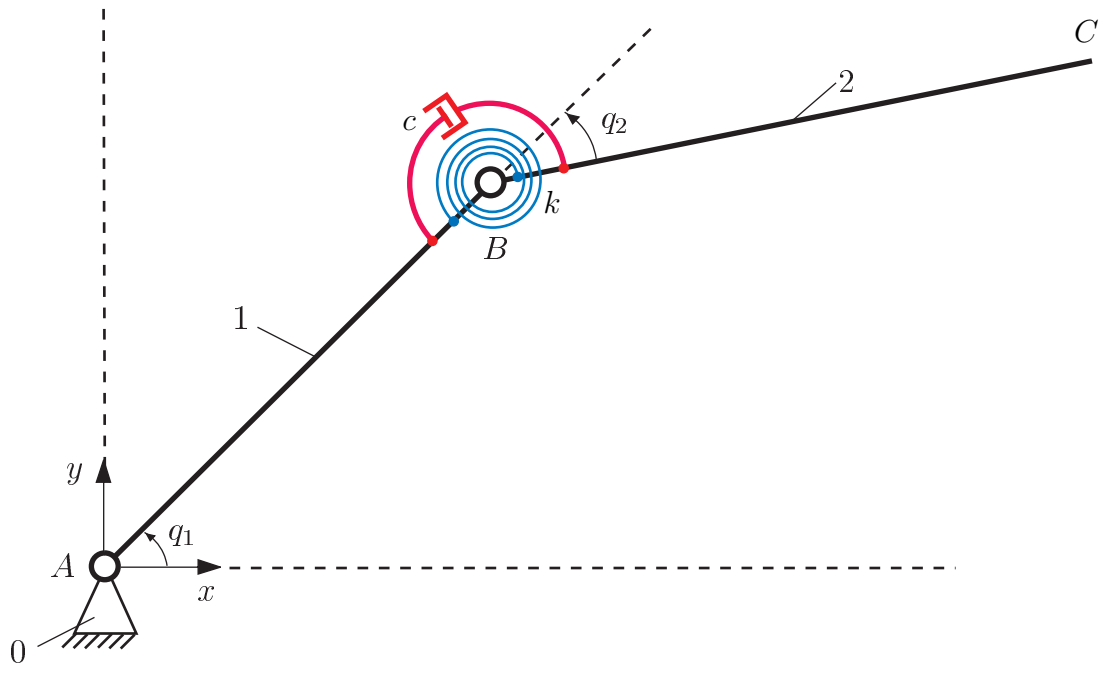


Homework - RR kinematic chain

An open kinematic chain with two uniform rigid rods 1 and 2 of mass $m_1 = m_2 = m$ and length $L_1 = L_2 = L$ is shown in the figure. The rod 1 is connected to the ground by a pin joint at A and to the rod 2 by a pin joint at B . The rods are constrained to move in a vertical plane xy . A spring of elastic constant k and a viscous damper with a damping constant c are opposing the relative motion of the link 2 with respect to link 1. The local acceleration of gravity is g .

1. Find the equations of motion for the RR kinematic chain using Newton-Euler method;
2. Solve the equations of motion using MATLAB.

Numerical application: $m_1 = m_2 = 1$ kg, $L_1 = L_2 = 1$ m, $g = 10$ m/s², $k = 100$ N m/rad, $c = 10$ N m s/rad, $q_1(0) = \pi/3$ rad, $q_2(0) = \pi/6$ rad, $\dot{q}_1(0) = \dot{q}_2(0) = 0$ rad/s.



Figure