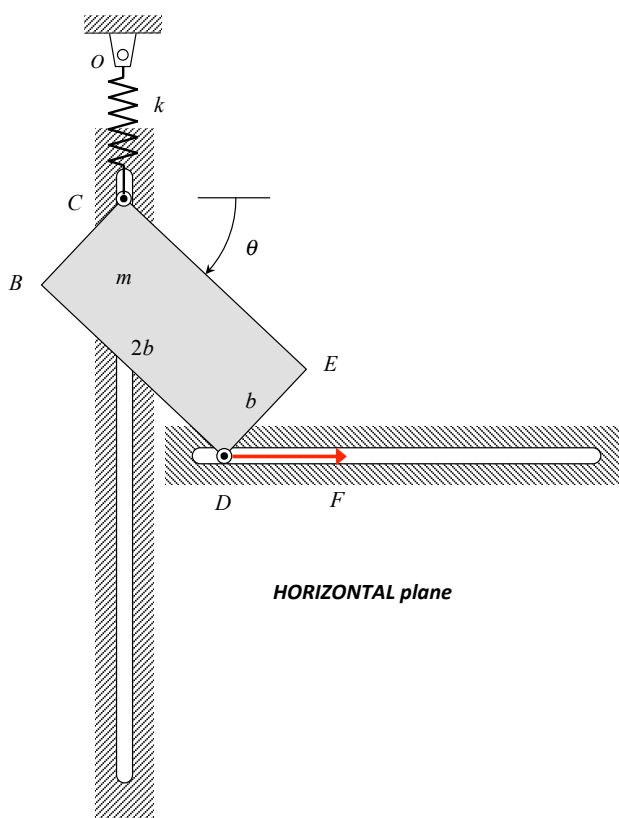


Homework H.5.J

Given: A homogeneous rectangular plate, having a mass of m and side lengths of b and $2b$, moves within a horizontal plane. Corners C and D are constrained to move in two slots, with the two slots between perpendicular to each other. A spring is attached between corner C and a fixed point O located along the slot within which C moves. A force acts at corner D of the plate, with the force acting along the line of the slot within which D moves. The spring is known to be unstretched when $\theta = 0$. The system is released from rest when $\theta = \theta_0$. Consider all surfaces to be smooth.

Find: Determine the angular speed of the plate when $\theta = 0$.



Use the following parameters in your analysis: $\theta_0 = 36.87^\circ$, $m = 2$ kg, $b = 100$ mm, $k = 4$ N/mm and $F = 50$ N.