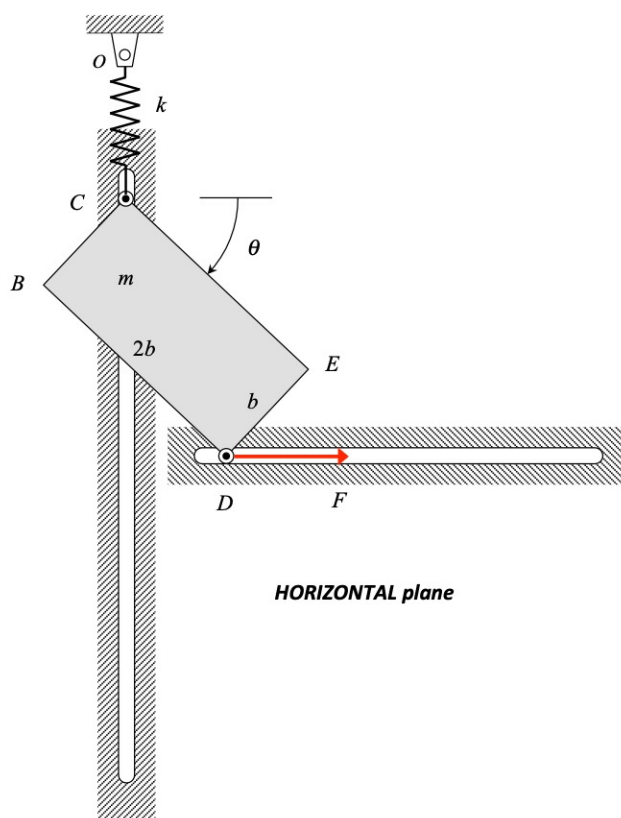


## Homework H.5.J

**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.