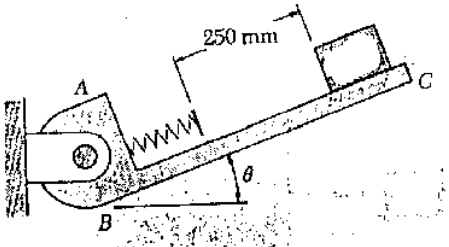
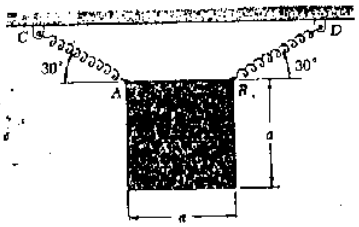
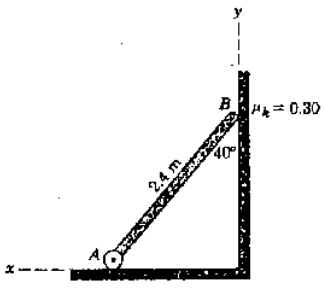
1. As *ABC* is slowly rotated, the 10 kg block starts to slide toward the spring when $\theta = 30°$. The maximum deflection of the spring (spring constant $k = 2500$ N/m) is 30 mm. Determine the values of the coefficients of static and kinetic friction. (25%)



2. A uniform square plate of mass m is suspended from two springs as shown. If spring BD breaks, determine at that instant (a) the angular acceleration of the plate, (b) the acceleration of point A, (c) the acceleration of point B. (25%)



3. The uniform 15-kg bar is supported on the horizontal surface at A by a small roller of negligible mass. If the coefficient of kinetic friction between end B and the vertical surface is 0.3, calculate the initial acceleration of end A as the bar is released from rest in the position shown. (25%)



注意:背面有試題

4. The 8-kg body is moved 0.2 m to the right of the equilibrium position and released from rest at time t = 0. The viscous damping coefficient c is 20 N s/m, and the spring stiffness k is 32 N/m. Determine
(a) its displacement x as a function of time (13%)
(b) the damped natural frequency. (12%)