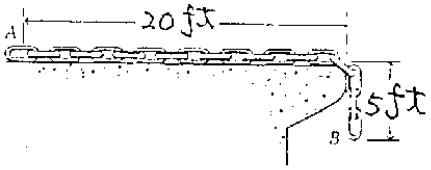
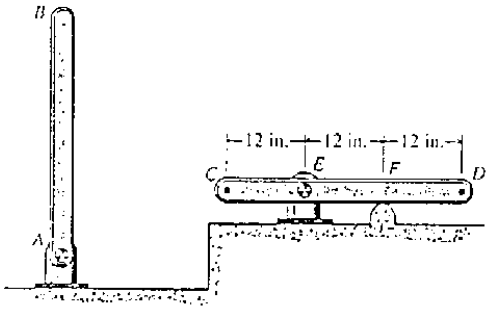
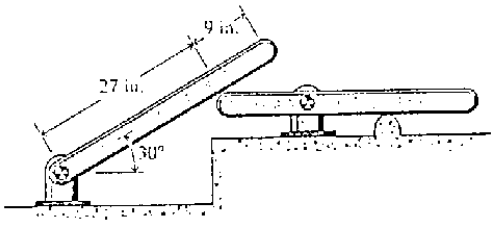
1. (25 %) The chain given in the figure has the specific weight 0.4 lb/ft. The static and kinetic coefficients of friction between the chain and the horizontal surface are 0.20 and 0.15, respectively. If the chain is released at rest in the position shown, find (a) the velocity at the time when the end A leaves the horizontal surface, and (b) the time required. (If the calculation of solution (b) is not easy, please at least write down the expression.)



2. (30%) Bar AB of Fig.(a) is attached to a frictionless pin at A; bar CD is attached to a frictionless pin at E and rests on a frictionless support at F. Both AB and CD are uniform slender bars 36 in. long and weighting 5 lb. Both bars are initially at rest when a slight disturbance causes bar AB to fall to the right and strike bar CD as shown in Fig.(b). If the coefficient of restitution is $e = 0.6$, determine (a) The angular velocities of both bars immediately after the impact. (b) The maximum angle of rebound of bar AB after impact.

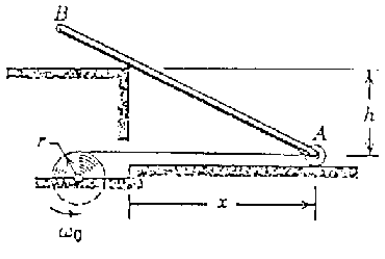


(a)



(b)

3. (25%) Calculate the angular velocity ω of the slender bar AB as a function of the distance x and the constant angular velocity ω_0 of the drum.



4. 請繪圖表示一具有下述運動cam-follower的displacement diagram。
(以cam angle θ ,每30 ° (1 cm = 30 °)繪一點連接起來)
a. rise with simple harmonic motion for 150 ° and its lift L=4 cm,
b. dwell for 60 °
c. then return with cycloidal motion for 120 °
d. dwell for 30 °
最後並將結果列表表示每30 ° 之位移y （小數點以下2位） (20%)

θ	0 °	30 °	60 °	90 °	120 °	150 °	180 °	·····	360 °
y (cm)									