**13.67** The system shown is in equilibrium when $\phi = 0$. Knowing that initially $\phi = 90°$ and that block $C$ is given a slight nudge when the system is in that position, determine the speed of the block as it passes through the equilibrium position $\phi = 0$. Neglect the weight of the rod.

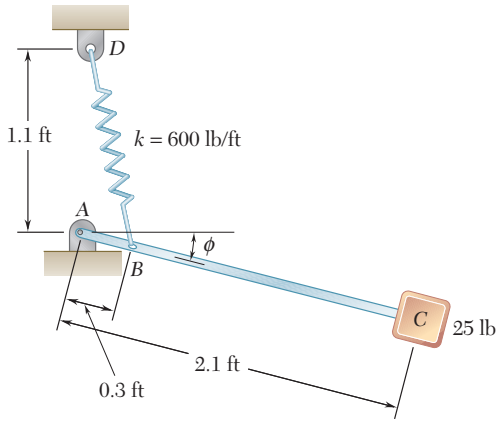


**Fig. *P13.67***

**13.68** A spring is used to stop a 50-kg package which is moving down a 20° incline. The spring has a constant $k = 30$ kN/m and is held by cables so that it is initially compressed 50 mm. Knowing that the velocity of the package is 2 m/s when it is 8 m from the spring and neglecting friction, determine the maximum additional deformation of the spring in bringing the package to rest.

**13.69** Solve Prob. 13.68 assuming the kinetic coefficient of friction between the package and the incline is 0.2.

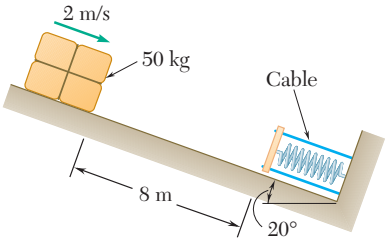


**Fig. P13.68**

**13.70** A 300-g pellet is released from rest at $A$ and slides with friction along the surface shown. Determine the force exerted on the pellet by the surface (*a*) just before the pellet reaches $B$, (*b*) immediately after it has passed through $B$.

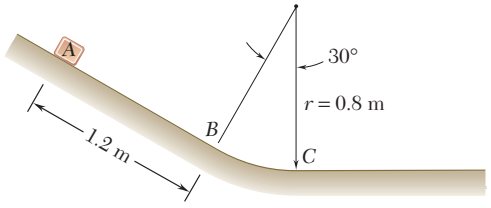


**Fig. P13.70 and P13.71**

**13.71** A 300-g pellet is released from rest at $A$ and slides without friction along the surface shown. Determine the force exerted on the pellet by the surface (*a*) just before the pellet reaches $C$, (*b*) immediately after it has passed through $C$.

**13.72** A 1.2-lb collar can slide without friction along the semicircular rod $BCD$. The spring is of constant 1.8 lb/in and its undeformed length is 8 in. Knowing that the collar is released from rest at $B$, determine (*a*) the speed of the collar as it passes through $C$, (*b*) the force exerted by the rod on the collar at $C$.

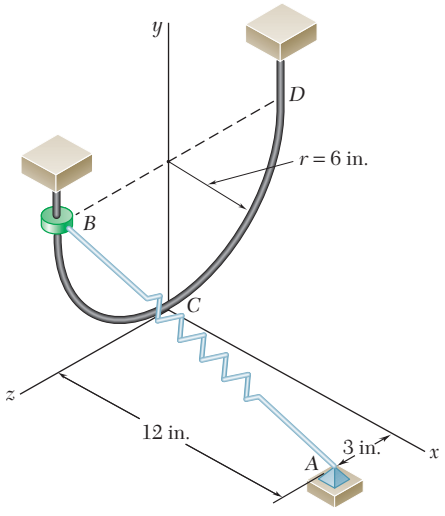


**Fig. P13.72**