

Problem 31

Suppose that a mass m slides without friction on a horizontal surface. The mass is attached to a spring with spring constant k , as shown in Figure 3.7.10, and is also subject to viscous air resistance with coefficient γ . Show that the displacement $u(t)$ of the mass from its equilibrium position satisfies Eq. (21). How does the derivation of the equation of motion in this case differ from the derivation given in the text?

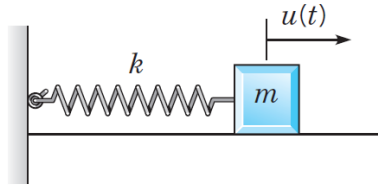


FIGURE 3.7.10 A spring–mass system.