‘linear ‘density 線密度

per 每， mass per length 每單位長度的質量

‘measured in ‘meters 用米來量

40. A rod of length 30.0 cm has linear density (mass per length) given by

$$\lambda = 50.0 + 20.0x$$

where x is the distance from one end, measured in meters, and λ is in grams/meter. (a) What is the mass of the rod? (b) How far from the $x = 0$ end is its center of mass?

block 塊、積木
‘friction 摩擦，
‘frictionless 無摩擦的，光滑的
i’nitial 初始的
i’nitially 初始地

65. **S** **Review.** A bullet of mass m is fired into a block of mass M initially at rest at the edge of a frictionless table of height h (Fig. P9.65). The bullet remains in the block, and after impact the block lands a distance d from the bottom of the table. Determine the initial speed of the bullet.

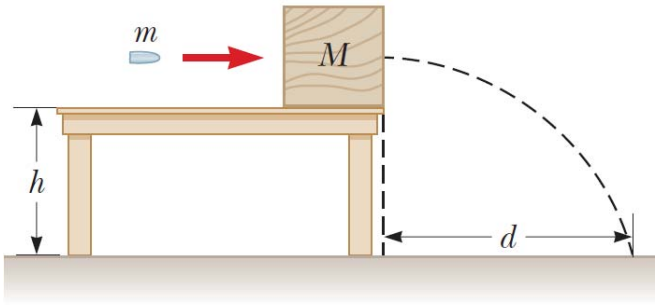

Figure P9.65

‘surface 表面，**hori’zontal surface** 水平面

spring 彈簧

‘impact 衝擊,撞擊,碰撞

con’vert 轉換，converted into 被轉換爲

in’ternal 內在的、內部的，internal energy 內能

73. A 5.00-g bullet moving with an initial speed of $v_i = 400 m/s$ is fired into and passes through a 1.00-kg block as shown in Figure P9.73. The block, initially at rest on a frictionless, horizontal surface, is connected to a spring with force constant 900 N/m. The block moves $d = 5.00$ cm to the right after impact before being brought to rest by the spring. Find (a) the speed at which the bullet emerges from the block and (b) the amount of initial kinetic energy of the bullet that is converted into internal energy in the bullet-block system during the collision.

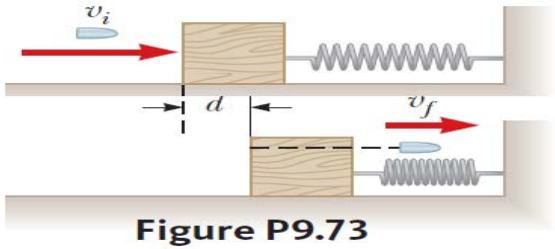

Figure P9.73

s’tationary 不動的、固定的

‘hopper 料斗、送料斗、貯液槽、跳躍者

con’veyer 搬運者;運輸裝置 傳送帶，conveyer belt 傳送帶

rate 比例,率;比率，

at the rate of 5.00 kg/s 以每秒5kg的（比）率

rate of change 改變率

‘constant speed 等速率

mo’mentum (mo’menta) 動量

ac’quire 取得,獲得

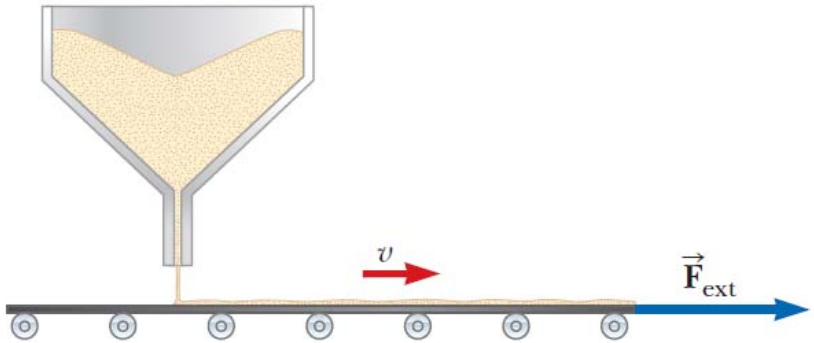

Figure P9.78

78. Q|C Sand from a stationary hopper falls onto a moving conveyor belt at the rate of 5.00 kg/s as shown in Figure P9.78. The conveyor belt is supported by frictionless rollers and moves at a constant speed of $v = 0.750$ m/s under the action of a constant horizontal external force $\vec{\mathbf{F}}_{\text{ext}}$ supplied by the motor that drives the belt. Find (a) the sand's rate of change of momentum in the horizontal direction, (b) the force of friction exerted by the belt on the sand, (c) the external force $\vec{\mathbf{F}}_{\text{ext}}$, (d) the work done by $\vec{\mathbf{F}}_{\text{ext}}$ in 1 s, and (e) the kinetic energy acquired by the falling sand each second due to the change in its horizontal motion. (f) Why are the answers to parts (d) and (e) different?

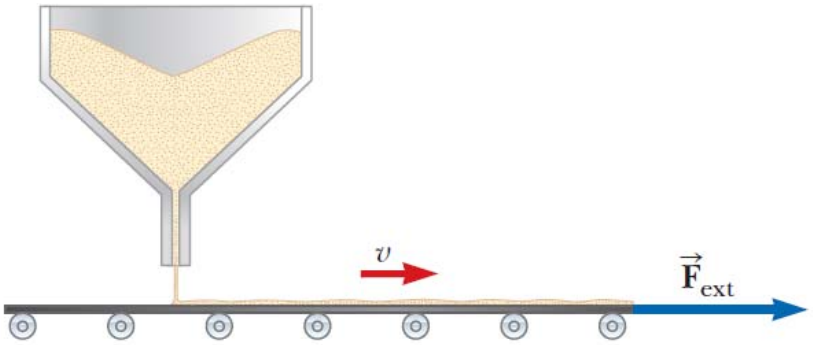

Figure P9.78