

Starting with 5-47

Which problem should I work next?

A. 3-60

B. 4-51

C. 4-56

D. 4-63

E. 5-52

$$P_{\text{ave}} = \frac{\Delta W}{\Delta t} \quad P_{\text{ave}} \Delta t = W \quad 1000 \text{ W} \times 3600 \text{ s} = 1 \text{ kW} \cdot \text{h}$$

6-67 How much power is needed to push a 50 kg chest at 0.8 m/s along a horizontal floor where the coefficient of friction is 0.25?

Express your answer using two significant figures.

How much work is done in pushing the chest 13 m?

Clicker Estimate your power consumption as you do deep knee-bends at 1 /second

6-40 In midday sunshine, solar energy strikes Earth at the rate of about $1 \text{ (kW/m}^2)$. (a) How long would it take a perfectly efficient solar collector of 15 m^2 area to collect $40 \text{ kW} \cdot \text{h}$ of energy?

Note: This is roughly the energy content in a gallon of gasoline.

5-48 A 300-g paperback book rests on a 1.2-kg textbook. A force is applied to the textbook, and the two books accelerate together from rest to 1 m/s in 0.5 s. The textbook is then brought to a stop in 0.33 s, during which time the paperback slides off.

Within what range does the coefficient of static friction between the two books lie?

A block initially at rest is allowed to slide down a frictionless ramp and attains a speed “ v ” at the bottom.

The block is again started from rest on a different ramp and now achieves a speed of “ $2v$ ” at the bottom.

How many times higher is the second ramp than the first?

A. 1

B. 2

C. 3

D. 4

E. 6

Assume a non-linear spring.

$$F = -kx - k_2 x^2$$

$$k = 10 \frac{\text{N}}{\text{m}} \quad k_2 = 100 \frac{\text{N}}{\text{m}^2}$$

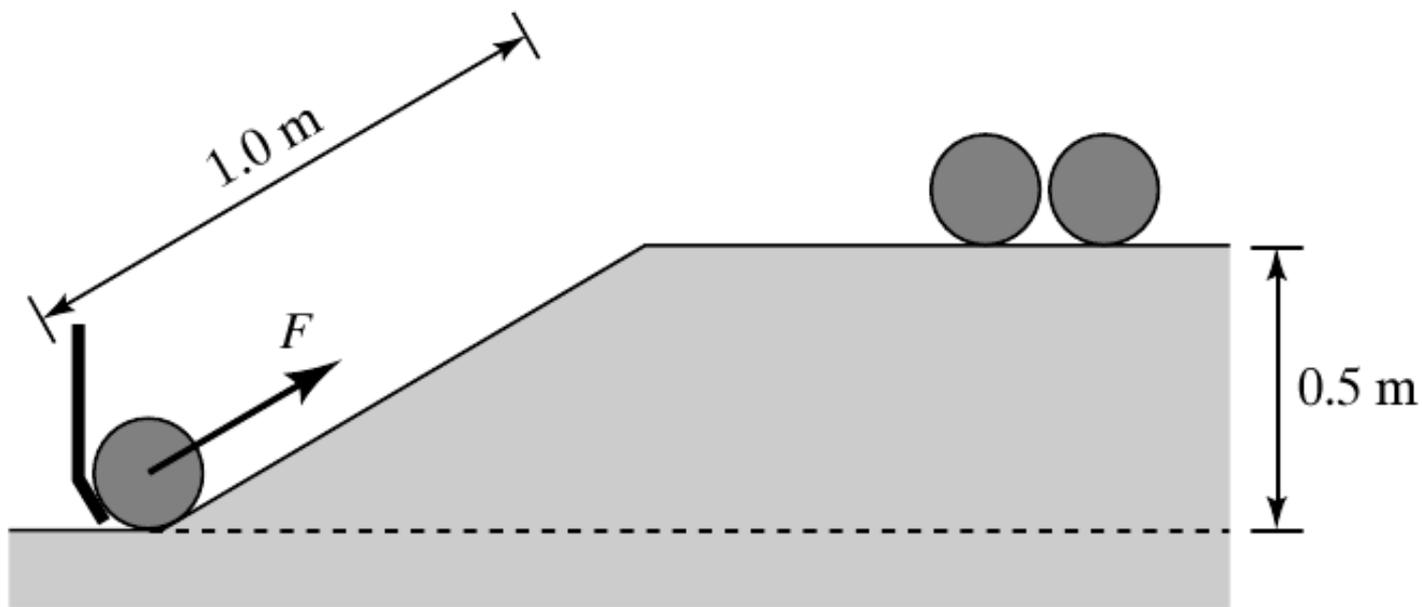
Calculate velocity for non-linear and linear springs for:

$$x = 0.01 \text{ m}$$

$$x = 0.1 \text{ m}$$

$$x = 0.2 \text{ m}$$

At the bowling alley, the ball-feeder mechanism must exert a force to push the bowling balls up a 1.0-m long ramp. The ramp leads the balls to a chute 0.5 m above the base of the ramp. Approximately how much force must be exerted on a 5.0-kg bowling ball?



- A. 5 N
- B. 10 N
- C. 15 N
- D. 25 N
- E. 50 N

Suppose you want to ride your mountain bike up a steep hill. Two paths lead from the bottom to the top, one twice as long as the other.

Compared to the average force you would exert if you took the short path, the average force you exert along the longer path is

- A. Four times as small
- B. Three times as small
- C. Half as small
- D. The same
- E. Undetermined – It depends on the time taken.