

Name: _____

Date: _____

3. A block of mass 0.250 kg is placed on top of a light, vertical spring of force constant $5\,000\text{ N/m}$ and pushed downward so that the spring is compressed by 0.100 m . After the block is released from rest, it travels upward and then leaves the spring. To what maximum height above the point of release does it rise?

7. Two objects are connected by a light string passing over a light, frictionless pulley as shown in Figure P8.7. The object of mass $m_1 = 5.00$ kg is released from rest at a height $h = 4.00$ m above the table. Using the isolated system model, (a) determine the speed of the object of mass $m_2 = 3.00$ kg just as the 5.00-kg object hits the table and (b) find the maximum height above the table to which the 3.00-kg object rises.

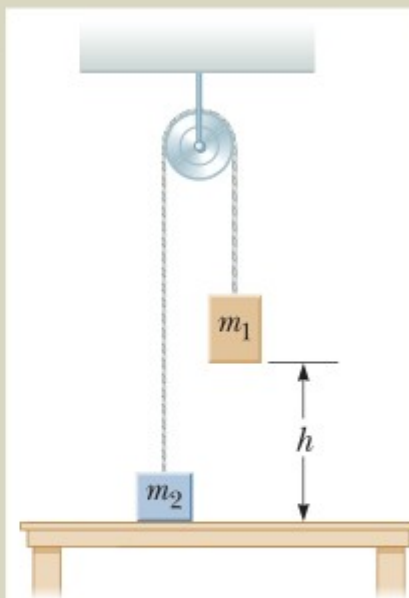


Figure P8.7
Problems 7 and 8.

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13. **S** A sled of mass m is given a kick on a frozen pond. The kick imparts to the sled an initial speed of v . The coefficient of kinetic friction between sled and ice is μ_k . Use energy considerations to find the distance the sled moves before it stops.

65. **Q C** A block of mass 0.500 kg is pushed against a horizontal spring of negligible mass until the spring is compressed a distance x (Fig. P8.65). The force constant of the spring is 450 N/m . When it is released, the block travels along a frictionless, horizontal surface to point A , the bottom of a vertical circular track of radius $R = 1.00\text{ m}$, and continues to move up the track. The block's speed at the bottom of the track is $v_{\text{A}} = 12.0\text{ m/s}$, and the block experiences an average friction force of 7.00 N while sliding up the track.

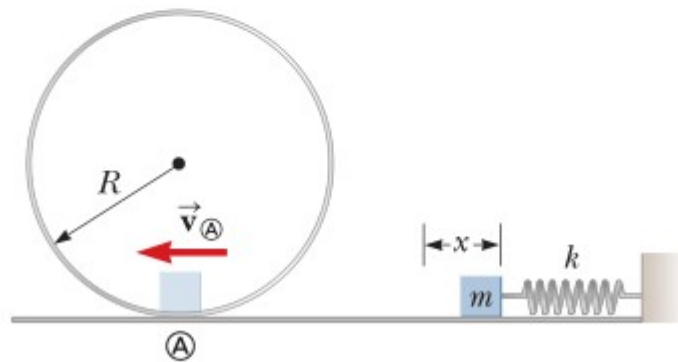


Figure P8.65

- (a) What is x ? (b) If the block were to reach the top of the track, what would be its speed at that point? (c) Does the block actually reach the top of the track, or does it fall off before reaching the top?