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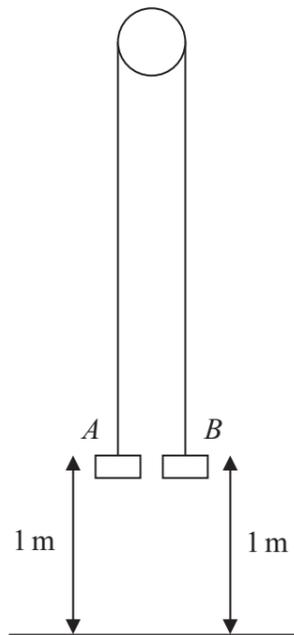


Figure 3

Two particles  $A$  and  $B$  have mass  $0.4 \text{ kg}$  and  $0.3 \text{ kg}$  respectively. The particles are attached to the ends of a light inextensible string. The string passes over a small smooth pulley which is fixed above a horizontal floor. Both particles are held, with the string taut, at a height of  $1 \text{ m}$  above the floor, as shown in Figure 3. The particles are released from rest and in the subsequent motion  $B$  does not reach the pulley.

(a) Find the tension in the string immediately after the particles are released. (6)

(b) Find the acceleration of  $A$  immediately after the particles are released. (2)

When the particles have been moving for  $0.5 \text{ s}$ , the string breaks.

(c) Find the further time that elapses until  $B$  hits the floor. (9)

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