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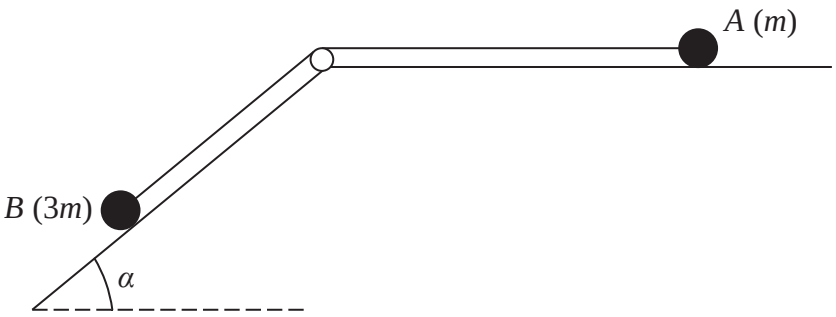

Figure 4

Two particles A and B have masses m and $3m$ respectively. The particles are attached to the ends of a light inextensible string. Particle A is held at rest on a rough horizontal table. The coefficient of friction between particle A and the table is $\frac{1}{5}$. The string lies along the table and passes over a small smooth light pulley that is fixed at the edge of the table. Particle B is at rest on a rough plane that is inclined to the horizontal at an angle α, where $\tan\alpha = \frac{4}{3}$, as shown in Figure 4. The coefficient of friction between particle B and the inclined plane is $\frac{1}{3}$. The string lies in the vertical plane that contains the pulley and a line of greatest slope of the inclined plane. The system is released from rest with the string taut and B slides down the inclined plane. Given that A does not reach the pulley,

(a) find the tension in the string,

(11)

(b) state where in your working you have used the fact that the string is modelled as being light,

(1)

(c) find the magnitude of the force exerted on the pulley by the string.

(4)

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