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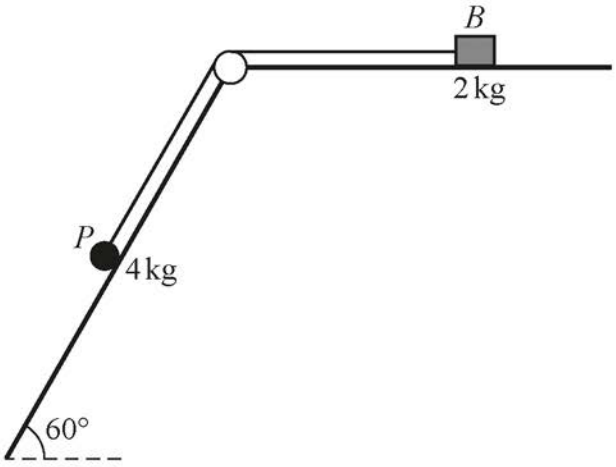

The diagram shows a small block B, of mass 2 kg, and a particle P, of mass 4 kg, which are attached to the ends of a light inextensible string. The string is taut and passes over a small smooth pulley fixed at the intersection of a horizontal surface and an inclined plane. The particle can move on the inclined plane, which is rough, and which makes an angle of 60° with the horizontal. The block can move on the horizontal surface, which is also rough.

The system is released from rest, and in the subsequent motion P moves down the plane and B does not reach the pulley.

It is given that the coefficient of friction between P and the inclined plane is twice the coefficient of friction between B and the horizontal surface.

(a) Determine, in terms of g, the tension in the string. **[7]**

When P is moving at $2\,\text{m s}^{-1}$ the string breaks. In the 0.5 seconds after the string breaks P moves 1.9 m down the plane.

(b) Determine the deceleration of B after the string breaks. Give your answer correct to **3** significant figures. **[5]**