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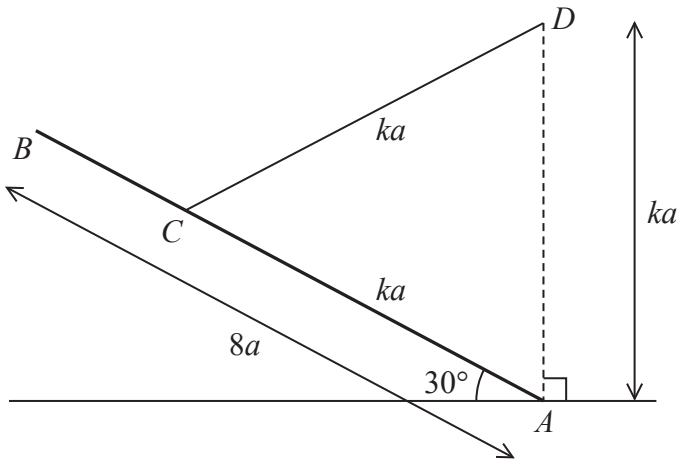


Figure 2

A uniform rod AB, of weight W and length $8a$, rests with one end A on rough horizontal ground. The rod is held in limiting equilibrium at 30° to the horizontal by a light inextensible string of length ka, where k is a constant. One end of the string is attached to the rod at C, where $AC = ka$. The other end of the string is attached to the fixed point D which is vertically above A such that $AD = ka$, as shown in Figure 2. The string lies in the vertical plane which contains the rod.

The coefficient of friction between the rod and the ground is $\frac{\sqrt{3}}{2}$.

(a) Show that the tension in the string is $\frac{4W}{k}$.

(2)

(b) Find the value of k.

(6)

The magnitude of the force exerted on the rod by the ground at A is λW.

(c) Find the value of λ.

(3)

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