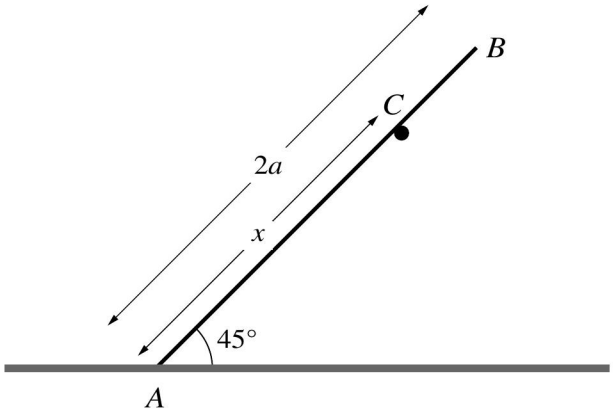

A uniform rod AB of length $2a$ and weight W rests against a smooth horizontal peg at a point C on the rod, where $AC = x$. The lower end A of the rod rests on rough horizontal ground. The rod is in equilibrium inclined at an angle of 45° to the horizontal (see diagram). The coefficient of friction between the rod and the ground is μ. The rod is about to slip at A.

(i) Find an expression for x in terms of a and μ. [5]

(ii) Hence show that $\mu \geqslant \frac{1}{3}$. [2]

(iii) Given that $x = \frac{3}{2}a$, find the value of μ and the magnitude of the resultant force on the rod at A. [4]