A uniform rod AB has length $2a$ and weight W. The end A rests on rough horizontal ground and the end B rests against a smooth vertical wall. The rod is in a vertical plane that is perpendicular to the wall. The angle between the rod and the horizontal is θ. A particle of weight $5W$ hangs from the rod at the point C, with $AC = xa$, where $0 < x < 1$.

(i) By taking moments about A, show that the magnitude of the normal reaction at B is $\dfrac{W(5x+1)}{2\tan\theta}$. [3]

The particle of weight $5W$ is now moved a distance a up the rod, so that $AC = (x+1)a$. This results in the magnitude of the normal reaction at B being double its previous value. The system remains in equilibrium with the rod at angle θ with the horizontal.

(ii) Show that $x = \frac{4}{5}$. [3]

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

(iii) Given that the rod is about to slip when the particle of weight $5W$ is in its second position, find the value of $\tan\theta$. [5]