



A uniform rod  $AB$  of length  $4a$  and weight  $W$  rests with the end  $A$  in contact with a rough vertical wall. A light inextensible string of length  $\frac{5}{2}a$  has one end attached to the point  $C$  on the rod, where  $AC = \frac{5}{2}a$ . The other end of the string is attached to a point  $D$  on the wall, vertically above  $A$ . The vertical plane containing the rod  $AB$  is perpendicular to the wall. The angle between the rod and the wall is  $\theta$ , where  $\tan \theta = 2$  (see diagram). The end  $A$  of the rod is on the point of slipping down the wall and the coefficient of friction between the rod and the wall is  $\mu$ .

Find, in either order, the tension in the string and the value of  $\mu$ .

[10]