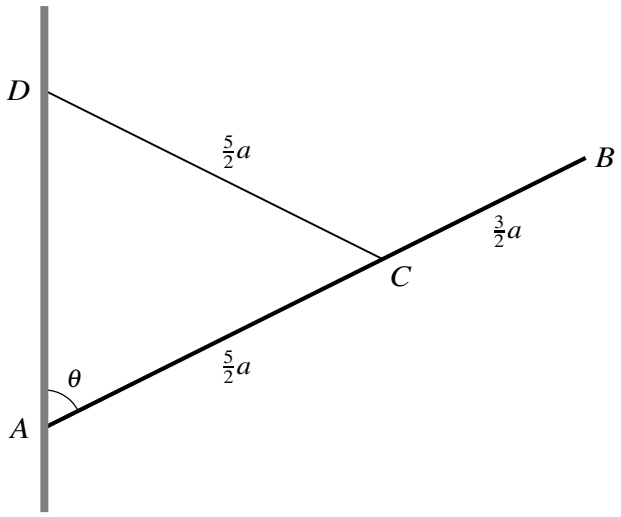
4



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 θ, 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 μ.

Find, in either order, the tension in the string and the value of μ. [10]

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