P

θ

A

2a

E

B

D

C

A uniform square lamina of side $2a$ and weight $W$ is suspended from a light inextensible string attached to the midpoint $E$ of the side $AB$. The other end of the string is attached to a fixed point $P$ on a rough vertical wall. The vertex $B$ of the lamina is in contact with the wall. The string $EP$ is perpendicular to the side $AB$ and makes an angle $\theta$ with the wall (see diagram). The string and the lamina are in a vertical plane perpendicular to the wall. The coefficient of friction between the wall and the lamina is $\frac{1}{2}$.

Given that the vertex $B$ is about to slip up the wall, find the value of $\tan\theta$. [8]