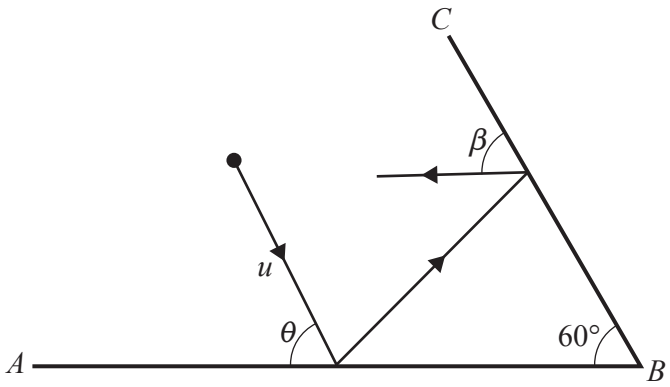
6



AB and *BC* are two fixed smooth vertical barriers on a smooth horizontal surface, with angle $ABC = 60°$. A particle of mass *m* is moving with speed *u* on the surface. The particle strikes *AB* at an angle θ with *AB*. It then strikes *BC* and rebounds at an angle β with *BC* (see diagram). The coefficient of restitution between the particle and each barrier is *e* and $\tan\theta = 2$.

The kinetic energy of the particle after the first collision is 40% of its kinetic energy before the first collision.

(a) Find the value of *e*. [4]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Find the size of angle β. [4]