

4. A light inextensible string of length l has one end attached to a fixed point A . The other end is attached to a particle P of mass m . The particle moves with constant speed v in a horizontal circle with the string taut. The centre of the circle is vertically below A and the radius of the circle is r .

Show that

$$gr^2 = v^2 \sqrt{(l^2 - r^2)}. \quad (9)$$



