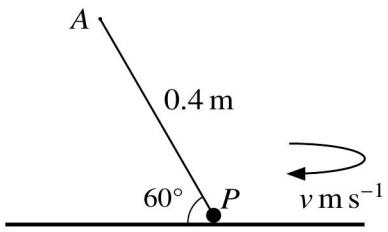

One end of a light inextensible string of length 0.4 m is attached to a fixed point A which is above a smooth horizontal surface. A particle P of mass 0.6 kg is attached to the other end of the string. P moves in a circle on the surface with constant speed v m s^{-1}, with the string taut and making an angle of 60° with the horizontal (see diagram).

(i) Given that $v = 0.5$, calculate the magnitude of the force that the surface exerts on P. [4]

(ii) Find the greatest possible value of v for which P remains in contact with the surface. [3]