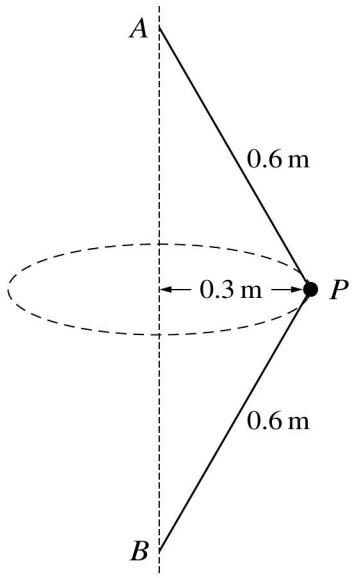

A particle P of mass 0.2 kg is attached to one end of a light inextensible string of length 0.6 m. The other end of the string is attached to a fixed point A. The particle P is also attached to one end of a second light inextensible string of length 0.6 m, the other end of which is attached to a fixed point B vertically below A. The particle moves in a horizontal circle of radius 0.3 m, which has its centre at the mid-point of AB, with both strings straight (see diagram).

(i) Calculate the least possible angular speed of P. [4]

The string AP will break if its tension exceeds 8 N. The string BP will break if its tension exceeds 5 N.

(ii) Find the greatest possible speed of P. [5]