

- 1 One end of a light elastic string, of natural length  $a$  and modulus of elasticity  $3mg$ , is attached to a fixed point  $O$  on a smooth horizontal plane. A particle  $P$  of mass  $m$  is attached to the other end of the string and moves in a horizontal circle with centre  $O$ . The speed of  $P$  is  $\sqrt{\frac{4}{3}ga}$ .

Find the extension of the string.

[4]

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page, typical of notebook or legal stationery. There are no margins, text, or other markings on the page.