

- 7 One end of a light inextensible string of length  $a$  is attached to a fixed point  $O$ . The other end of the string is attached to a particle  $P$  of mass  $m$ . The particle  $P$  is held vertically below  $O$  with the string taut and then projected horizontally. When the string makes an angle of  $60^\circ$  with the upward vertical,  $P$  becomes detached from the string. In its subsequent motion,  $P$  passes through the point  $A$  which is a distance  $a$  vertically above  $O$ .

- (a) The speed of  $P$  when it becomes detached from the string is  $V$ . Use the equation of the trajectory of a projectile to find  $V$  in terms of  $a$  and  $g$ . [4]

[illegible]

- (b)** Find, in terms of  $m$  and  $g$ , the tension in the string immediately after  $P$  is initially projected horizontally. [4]

This image shows a full page of a handwriting practice worksheet. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for letter height. The entire page is otherwise blank, with no margins, text, or other markings.