

A particle  $P$  is projected with speed  $20 \text{ m s}^{-1}$  at an angle of  $60^\circ$  below the horizontal, from a point  $O$  which is  $30 \text{ m}$  above horizontal ground.

(i) Calculate the time taken by  $P$  to reach the ground. [3]

(ii) Calculate the speed and direction of motion of  $P$  immediately before it reaches the ground. [4]