

A particle  $P$  is projected with speed  $u$  at an angle of  $30^\circ$  above the horizontal from a point  $O$  on a horizontal plane and moves freely under gravity. The particle reaches its greatest height at time  $T$  after projection.

Find, in terms of  $u$ , the speed of  $P$  at time  $\frac{2}{3}T$  after projection.

[5]