

- 5 A particle  $P$  is projected from a point  $O$  on a horizontal plane and moves freely under gravity. Its initial speed is  $u \text{ ms}^{-1}$  and its angle of projection is  $\sin^{-1}(\frac{4}{5})$  above the horizontal. At time 8 s after projection,  $P$  is at the point  $A$ . At time 32 s after projection,  $P$  is at the point  $B$ . The direction of motion of  $P$  at  $B$  is perpendicular to its direction of motion at  $A$ .

Find the value of  $u$ .

[7]

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. There are no margins, text, or other markings on the paper.