

- 7 The points O and P are on a horizontal plane, a distance 8 m apart. A ball is thrown from O with speed $u \text{ ms}^{-1}$ at an angle θ above the horizontal, where $\tan \theta = \frac{4}{3}$. At the same instant, a model aircraft is launched with speed 5 ms^{-1} parallel to the horizontal plane from a point 4 m vertically above P . The model aircraft moves in the same vertical plane as the ball and in the same horizontal direction as the ball. The model aircraft moves horizontally with a constant speed of 5 ms^{-1} . After T s, the ball and the model aircraft collide.

(a) Find the value of T .

[6]

This image shows a full page of white paper with horizontal dashed lines, typical of primary-ruled notebook paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(b) Find the direction in which the ball is moving immediately before the collision. [3]

[illegible]