

14 A man runs at a constant speed of 4 m s^{-1} along a straight horizontal road. A woman is standing on a bridge that spans the road. At the instant that the man passes directly below the woman she throws a ball with initial speed $u \text{ m s}^{-1}$ at α° above the horizontal. The path of the ball is directly above the road. The man catches the ball 2.4 s after it is thrown. At the instant the man catches it, the ball is 3.6 m below the level of the point of projection.

(a) Explain what it means that the ball is modelled as a particle. **[1]**

(b) Find the vertical component of the ball's initial velocity. **[2]**

(c) Find each of the following.

- The value of u
- The value of α

[4]