11

A golfer hits a ball from a point A with a speed of $25\,\mathrm{m\,s^{-1}}$ at an angle of $15°$ above the horizontal. While the ball is in the air, it is modelled as a particle moving under the influence of gravity. Take the acceleration due to gravity to be $10\,\mathrm{m\,s^{-2}}$.

The ball first lands at a point B which is $4\,\mathrm{m}$ below the level of A (see diagram).

(a) Determine the time taken for the ball to travel from A to B. **[3]**

(b) Determine the horizontal distance of B from A. **[2]**

(c) Determine the direction of motion of the ball 1.5 seconds after the golfer hits the ball. **[4]**

The horizontal distance from A to B is found to be greater than the answer to part **(b)**.

(d) State one factor that could account for this difference. **[1]**