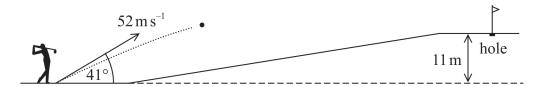
18 A golfer hit a golf ball into the air at a speed of  $52 \,\mathrm{m\,s^{-1}}$  and an angle of  $41^{\circ}$  to the horizontal, as shown.



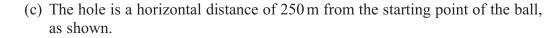
The ball landed on the ground near a hole. The ground was 11 m higher than the starting point of the ball.

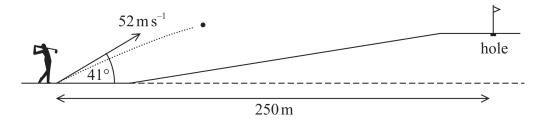
(a) Show that the vertical component of the ball's initial velocity was about  $30\,\mathrm{m\,s^{-1}}$ .

(2)

(b) Show that the time taken by the ball to reach the ground was about 7 s. You should ignore the effects of air resistance.

(3)





Deduce whether the ball landed within 5.0 m of the hole. You should ignore the effects of air resistance.

(Total for Question 18 = 8 marks)

(3)