2 A ball on horizontal ground is kicked towards a vertical wall. Fig. 2.1 shows the path of the ball.

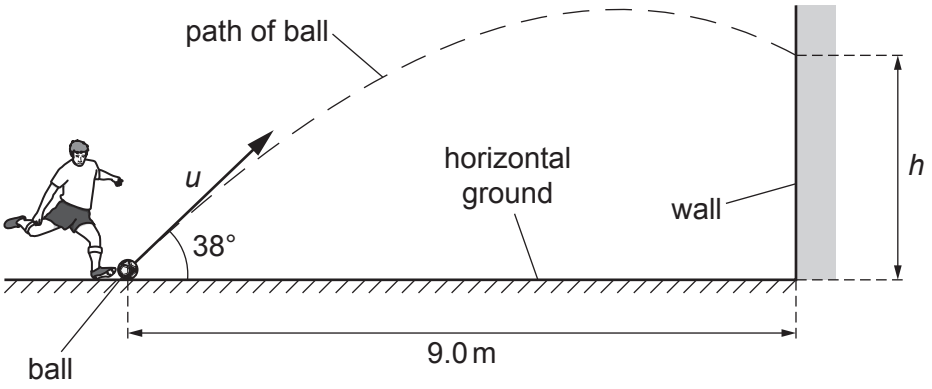

Fig. 2.1 (not to scale)

The ball has an initial velocity u at an angle of 38° to the ground. The ball travels a horizontal distance of 9.0 m before striking the wall at a height h above the ground. The horizontal component u_H of the initial velocity of the ball is 9.5 m s^{-1}.

Air resistance is negligible.

(a) (i) Show that the time t for the ball to reach the wall is 0.95 s.

[1]

(ii) Calculate the vertical component u_V of the initial velocity of the ball.

u_V = ... m s^{-1} [2]

(iii) Determine h.

h = ... m [2]

(b) The speed of the ball just after striking the wall is less than its speed just before striking the wall.

State what this indicates about the nature of the collision of the ball with the wall.

.....

..... [1]

[Total: 6]