1 A ball is thrown from a point P, which is at ground level, as illustrated in Fig. 1.1.

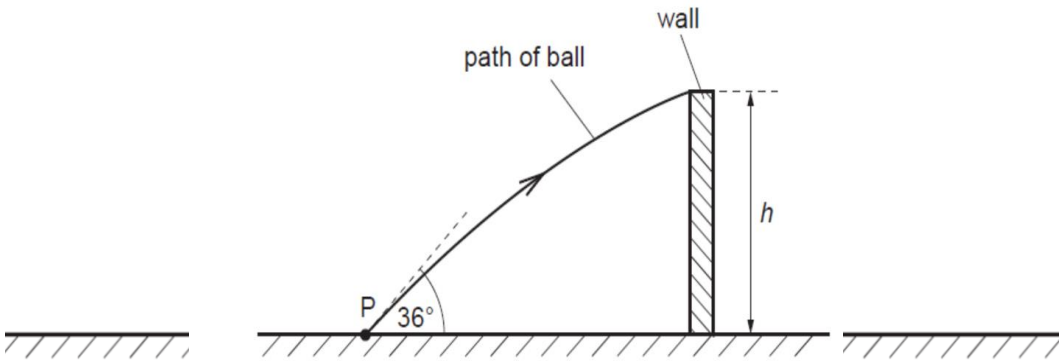

Fig. 1.1

The initial velocity of the ball is 12.4 m s^{-1} at an angle of 36° to the horizontal.

The ball just passes over a wall of height *h* at point Q. The ball reaches the wall 0.17 s after it has been thrown.

(a) Assuming air resistance to be negligible,

(i) show that the height of the wall is 1.1 m.

[1]

(ii) determine the velocity of the ball at point Q.

[3]

magnitude of the velocity = _____ $m\,s^{-1}$

direction of the velocity = _____.

(b) A second ball is thrown from point P with the same velocity as the ball in **(a)**. For this ball, air resistance is not negligible. This ball hits the wall elastically at an angle and rebounds.

On Fig. 1.1, sketch a possible path of this ball between point P and the point when it first hits the ground. [2]

[Total : 6]