

Unit 1: The motion of projectiles

Name: _____

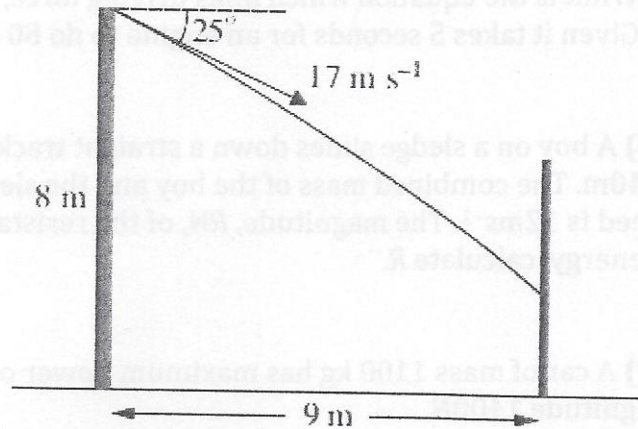
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Q1) A particle is launched at 20ms^{-1} at an angle of projection of 60° . Find its speed 2 seconds later. (4)

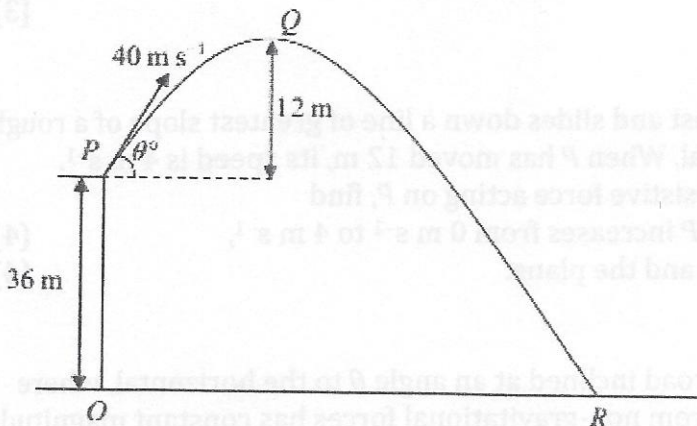
Q2) A ball is projected with an initial speed of 17ms^{-1} at an angle of 25° below the horizontal from a point on the top of a vertical wall. The point of projection is 8m above horizontal ground. The ball hits a vertical fence which is at a horizontal distance of 9m from the wall (see diagram).



(a) Calculate the height above the ground of the point where the ball hits the fence. (5)

(b) Calculate the direction of motion of the ball immediately before it hits the fence. (5)

(c) It is given that 30% of the kinetic energy of the ball is lost when it hits the fence. Calculate the speed of the ball immediately after it hits the fence. (4)



Q3) A ball is projected with speed 40 m s^{-1} from a point P on a cliff above horizontal ground.

The point O on the ground is vertically below P and OP is 36 m . The ball is projected at an angle θ° to the horizontal.

The point Q is the highest point of the path of the ball and is 12 m above the level of P . The ball moves freely under gravity and hits the ground at the point R , as shown above. Find:

(a) the value of θ ,

(3)

(b) the distance OR ,

(6)

(c) the speed of the ball as it hits the ground at R .

(3)