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# Brac University



## Assignment

Course Code : PHY111  
Course Title : Fundamentals of Physics  
Assignment No : 02

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(even) //

593  
↓ (1, 4 > 8)  
Given that,

time the ball will be taking,  $T = 4 \text{ sec.}$

the angle,  $\theta = -30^\circ$  (as it is below the horizontal x-axis)

initial velocity,  $v_0 = 7.5 \text{ m s}^{-1}$

∴ the distance between the ball and building,

$$x = (v_0 \cos \theta_0) T = 7.5 \times \cos(-30^\circ) \times 4$$

$$= 15\sqrt{3} \text{ m} = 25.98 \text{ m.}$$

(Ans.)

⑥

Given that,

$$\text{Angle, } \theta_0 = -30^\circ$$

$$\text{Initial Velocity, } V_0 = 7.5 \text{ ms}^{-1}$$

$$\text{Time, } t = 4 \text{ sec.}$$

$$\text{Gravitational Acceleration, } g = 9.8 \text{ ms}^{-2}$$

As per formula we know,

$$h = V_0 \sin \theta_0 \times t - \frac{1}{2} g t^2$$

By plugging in the values, we can find the height ( $h$ ).

$$\Rightarrow h = 7.5 \times \sin(-30^\circ) \times 4 - \frac{1}{2} \times 9.8 \times (4)^2$$

$$\Rightarrow h = -15 - 78.4$$

$$\Rightarrow h = -93.4 \text{ meters}$$

Because, the angle (below the horizontal line) was negative we received negative result. But as "height" can never be negative; we can say,

$$h = 93.4 \text{ m. (Ans) } \checkmark$$

According to the question,  
From below the balcony distance with the ball,  $h = 8\text{m}$

from general equation,

$$h = v_0 t + \frac{1}{2} g t^2$$

$$\Rightarrow 8 = v_0 t + \frac{1}{2} g t^2$$

$$\Rightarrow 7.5t + 4.9t^2 - 8 = 0$$

either,

or,

$$t = 0.72 \text{ sec.}$$

$$t = -2.25 \text{ sec.}$$

as time cannot be negative —

$$\therefore t = 0.72 \text{ sec}$$

(Ans),