

Answer on question #55223, Physics / Mechanics

Question An object is thrown upward at an angle of 37 degrees with a velocity of 10m/s from the top of a 20m high building. Where, from the foot of the building, would it land?

Solution Let us first find time of flight. Equation for vertical axis:

$$h_0 + t_f v_v - gt_f^2/2 = 0$$

$$h_0 + v_0 \sin 37^\circ t_f - gt_f^2/2 = 0$$

$$20 + 6t_f - 4.9t_f^2 = 0$$

$$t \approx 2.72 \text{ m/s}$$

From this we can find horizontal distance:

$$s = v_h t_f = v_0 \cos 37^\circ t_f = 10 \cdot 0.8 \cdot 2.72 \approx 21.7 \text{ m}$$

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