Answer on Question #85170 – Mechanics Relativity

A ball is thrown vertically upward from the ground level hits the ground after 4s. Calculate the maximum height it reached during the journey.

Solution

Fall time and rise time is equal so $t_f = t_r = t/2 = 2[s]$.

Using the kinematic equation of motion

$$x = x_0 + vt + \frac{1}{2}gt^2,$$

where v-speed of the ball, g – free fall acceleration. We fixes $x_0 = 0$ and at highest point of his trajectory $x = h$, (where the ball speed is zero $v = 0$) we obtain

$$h = \frac{1}{2}gt_f^2 = \frac{1}{2}\cdot 9,8[\mathrm{m/s^2}]\cdot 4[\mathrm{s^2}] = 19,6[\mathrm{m}]$$

Answer: maximum height is 19,6m