1. A body falls freely from top for a tower. It covers 36% of total height in last second before stricking the ground level. A height of tower is?

$\eta = 0.36$	*Solution.*
$t_0 = 1s$	Let introduce the coordinate system, so that *Y*-axis is directed vertically upwards and zero level corresponds the ground.
$h - ?$	

The coordinate of a body obeys the following law: $y = h - \frac{gt^2}{2}$,

where h is the tower height.

The total time of falling (at that time $y = 0$): $t_1 = \sqrt{\frac{2h}{g}}$.

According to the task, $y(t_1 - t_0) - y(t_1) = \eta \cdot h$, $\left[h - \frac{g}{2}\left(\sqrt{\frac{2h}{g}} - t_0\right)^2\right] - 0 = \eta \cdot h$.

Solving the last equation, one can obtain the height: $h = \frac{g}{2}\left(\frac{t_0}{1 \pm \sqrt{1-\eta}}\right)^2$.

Let check the dimension: $[h] = \frac{m}{s^2} \cdot s^2 = m$.

Let evaluate the quantity:

$h = \frac{9.81}{2} \cdot \left(\frac{1}{1-\sqrt{1-0.36}}\right)^2 = 122.6(m)$, $h = \frac{9.81}{2} \cdot \left(\frac{1}{1+\sqrt{1-0.36}}\right)^2 = 1.51(m)$.

Answer: $122.6\,m$ or $1.51\,m$.