1. A pilot performs an evasive maneuver by diving vertically at 310 m/s. If he can withstand an acceleration of 9.0g's without blacking out, at what altitude must he begin to pull out of the dive to avoid crashing into the sea?

$v_0 = 310\frac{m}{s}$ $a = 9\,g$	*Solution.* A pilot avoids crashing into the sea, if the stop (velocity equals to zero) will be at the sea level, at least.
$h - ?$	Let Y-axis to be directed vertically down.

Assuming the fly of the airline to be the motion with constant acceleration, we can connect the displacement and velocities and the acceleration: $s = \frac{v_1^{\,2} - v_0^{\,2}}{2a}$,

where v_0 and v_1 are the initial and final velocity.

The necessary altitude is $h = -s$. So, $\boxed{h = \frac{v_0^{\,2} - v_1^{\,2}}{18g}}$.

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

Let evaluate the quantity: $h = \frac{310^2 - 0^2}{18 \cdot 9.81} = 544(m)$.

Answer: 544 *m*.