

Symbol	Importance	Value	Units	
a - acceleration	$\mathbf{dv/dt}$	9.8...0	m/s^2	Variables
v - velocity	$\mathbf{-dh/dt}$	0...50	m/s	
h - height		1000	m	
t - time		10	s	
g - gravity constant		9.8	m/s^2	Parameters
C - drag coefficient	Contribute to air drag coefficient K	0.0039	-	
S - area of crossection			m^2	
ρ - dencity of the air			kg/m^3	
m - skydiver's mass			kg	

$$v=180 \text{ [km/h]} = 180 \text{ 000}/(60*60) \text{ [m/s]} = 50 \text{ [m/s]}$$

$$A = g - (C*S*\rho/2/m)*v^2$$

$$a=0; g=9.8; v=50; C*S*\rho/2/m = K$$

$$9.8=K*50*50 \Rightarrow K = 9.8/2500=0.0039$$

$$v_1=0.95*50 = 47.5 \text{ [m/s]}$$

1st differential equation:

$$dh(t)/dt = -v(t)$$

2nd differential equation:

$$a=dv(t)/dt = g - C*S*\rho/2/m*(v(t)^2)$$

Distance at which the skydiver will be in 10 sec after achieveing 95% speed limit.

