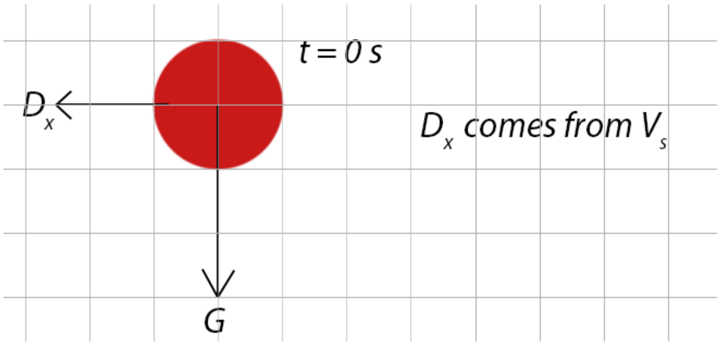
Vertical Total Force Equation

Drag Equation:

$$D = C_d \times A \times \rho \times \frac{V^2}{2}$$

Newton Force Law:

$$F = m \times a$$



$$-D_{x=} - C_d \times A \times \rho \times \frac{V^2}{2}$$

$$ma = -D_x$$

$$ma = -k \times V^2$$

$$m \times \frac{dv}{dt} = -k \times V^2$$

$$dv = \frac{-kV^2}{m}(dt)$$

$$\frac{dv}{V^2} = -\frac{k}{m}(dt)$$

$$\int_{V_{bas}}^{0} \frac{1}{V^2}(dv) = \int_{0}^{t\prime} -\frac{k}{m}(dt)$$

$$\boxed{\frac{1}{V_{bas}} - \frac{1}{V'} = -\frac{k \times t'}{m}}$$

$$\frac{V' - V_{bas}}{V' \times V_{bas}} = \frac{-k \times t'}{m}$$

$$-k \times t' \times V' \times V_{bas} = m(V' - V_{bas})$$

$$-k \times t' \times V' \times V_{bas} = mV' - mV_{bas}$$

$$k \times t' \times V' \times V_{bas} + mV' = mV_{bas}$$

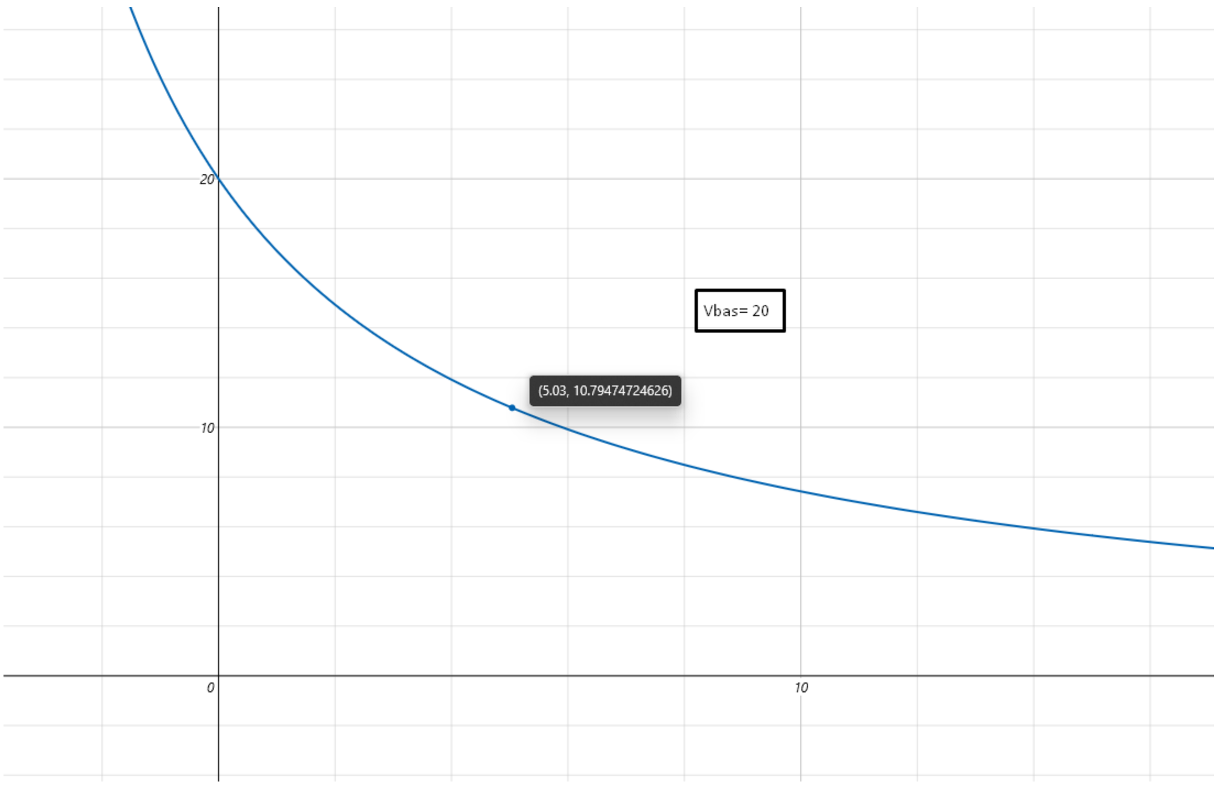
$$V'(k \times t' \times V_{bas} + m) = mV_{bas}$$

$$V' = \frac{mV_{bas}}{k \times t' \times V_{bas} + m}$$

$$V(t) = \frac{mV_{bas}}{k \times t \times V_{bas} + m}$$

$$V(t) = \frac{1}{\frac{tk}{m} + (V_{bas})^{-1}}$$

$$y = \frac{1}{x \times 0{,}0084766696626557327586206896551 7 + (V_{bas})^{-1}}$$



$$k = 0,0012291171010850812 5$$

$$C_d = 0,48$$

$$A = 0,0044178646640625 m^2$$

$$\rho = 1,15923 kg/m^3$$

$$g = 9,80665 m/s^2$$

$$m = 0,145 kg$$