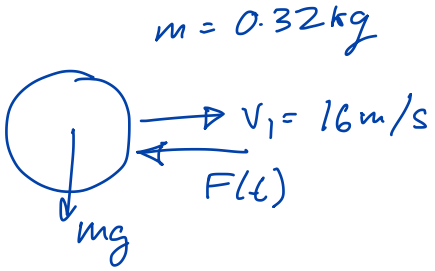
UBC-DYN-17-039 (Impulse Prelab)

$$F(t) = \frac{-t^2}{3}\ N$$



$$mv_1 + \int_0^{t_f} \frac{-t^2}{3}\,dt = 0$$

$$mv_1 + \frac{-t^3}{9}\Big|_0^{t_f} = 0$$

$$mv_1 - \frac{t_f^3}{9} = 0$$

$$9mv_1 = t_f^3$$

$$t_f = (9mv_1)^{1/3}$$

$$= (9(0.32\text{kg})(16\text{m/s}))^{1/3}$$

$$= 3.585\text{s}$$ (A)

$$\frac{d}{dt} t^3 = 3t^2$$

$$\int t^2 = \frac{t^3}{3}$$