$$\int 5t\,dt =? \quad 5t^2$$

$$\frac{d}{dt}(5t^2) = 10t$$

$$\int t^N\,dt = (\frac{1}{N+1})\,t^{N+1}$$

$$\int 56.8t^3\,dt = ??$$

$$\begin{aligned} \int 56.8t^3\,dt &= 56.8\int t^3\,dt \\ &= 56.8\left(\frac{1}{4}t^4\right) \\ &= 14.2t^4 \end{aligned}$$

$$(x - x_0) = \int 35 \text{ m/s } dt$$

$$\text{mass} = \int \rho(V)\,dV$$

$$v(t) = 30(\text{m/s}) - 2(\text{m/s}^2)t$$

$$\begin{aligned} (x - x_0) &= \int_{t=0\text{s}}^{t=2\text{s}} v(t)\,dt \\ &= \int_{t=0\text{s}}^{t=2\text{s}} \Big(30(\text{m/s}) - 2(\text{m/s}^2)t\Big)\,dt \\ &= \Big(30(\text{m/s})t - 1(\text{m/s}^2)t^2\Big]_{t=0\text{s}}^{t=2\text{s}} \end{aligned}$$

$$(x - x_0) = \Big[30(\text{m/s})(2s) - 1(\text{m/s}^2)(2s)^2\Big] - \Big[30(\text{m/s})(0s) - 1(\text{m/s}^2)(0s)^2\Big]$$