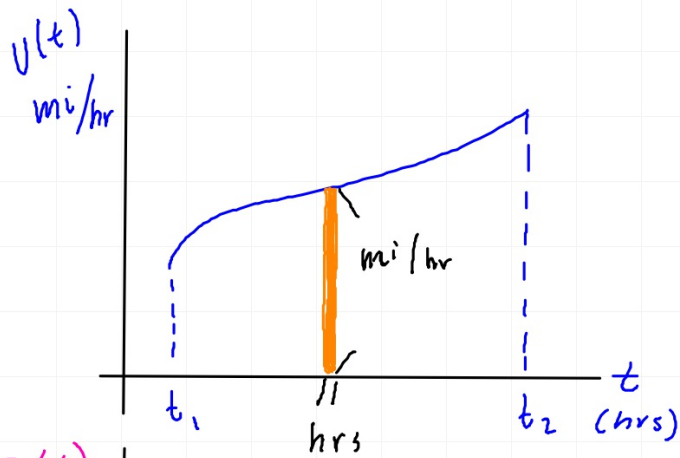


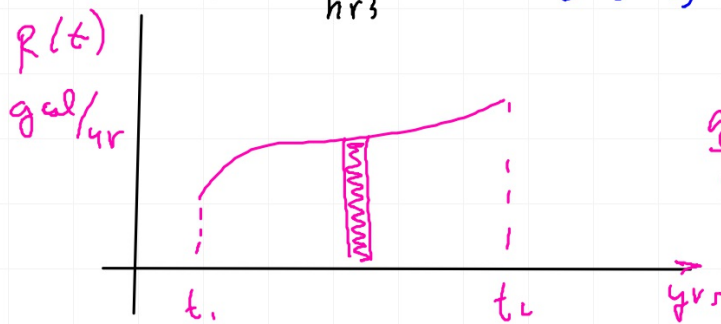
Applications of the Definite Integral as an Accumulator

Rate functions $\rightarrow$ m/s, mi/hr, in/hr
gal/hr

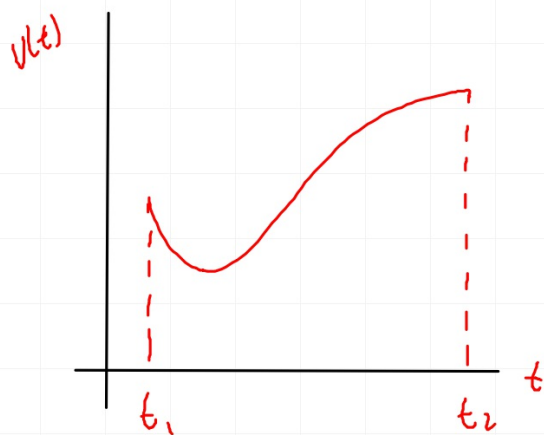
$$\int_{t_1}^{t_2} R(t) dt \rightarrow \text{TOTAL AMT}$$



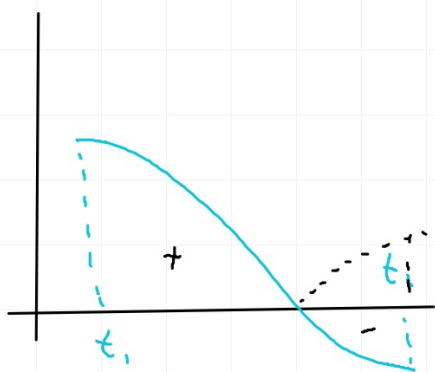
$$\frac{\text{mi}}{\text{hr}} \cdot \text{hr} = \underline{\underline{\text{mi}}}$$



$$\frac{\text{gal}}{\text{yr}} \cdot \text{yr} = \text{gal}$$

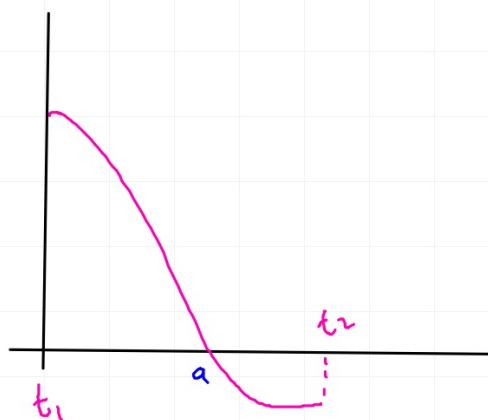


$$\int_{t_1}^{t_2} v(t) dt \rightarrow \begin{matrix} \text{TOTAL DIST} \\ \text{NET DIST} \end{matrix}$$



$$\int_{t_1}^{t_2} v(t) dt \rightarrow \text{net dist}$$

$$\int_{t_1}^{t_2} |v(t)| dt \rightarrow \text{TOTAL DIST.}$$



Total

$$\int_{t_1}^{t_2} |v(t)| dt = \int_{t_1}^a v(t) dt - \int_a^{t_2} v(t) dt$$

Net

$$\int_{t_1}^{t_2} v(t) dt$$

Where obj is at t_2

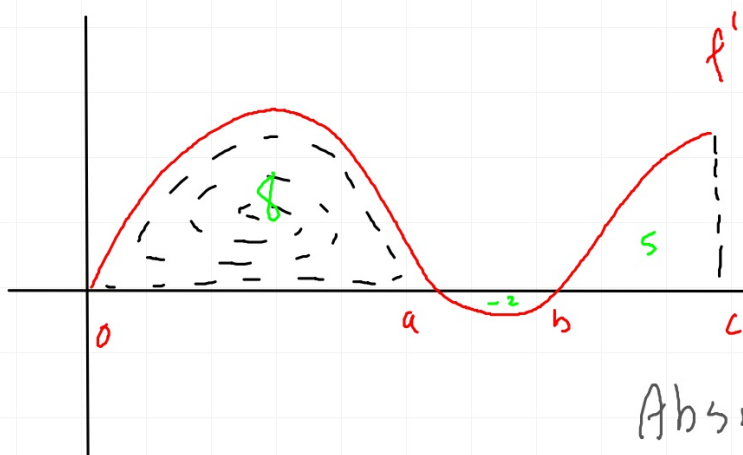
$$s(t_2) = s(t_1) + \int_{t_1}^{t_2} v(t) dt$$

How much is present at t_2 ?

$$A(t_1) + \int_{t_1}^{t_2} A'(t) dt$$

Vel func may go negative - no others will

$$\int_0^s R(t) dt$$



Where does f
have an abs. max

$(0, a)$ $f \uparrow$

$\int_0^a f'(x) dx \rightarrow$ how much
the func
incr.

Abs max occurs at $x=c$
because $\int_a^b |f'(x)| dx < \int_b^c f'(x) dx$

f increased more on (c, b) than
it decreased on (a, b) .