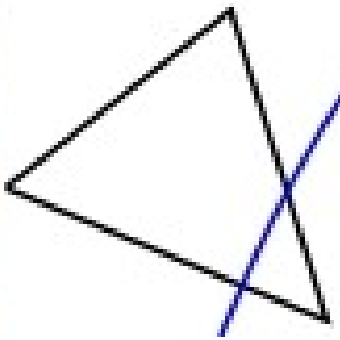
Mathematischer Vorkurs zu den Vorlesungen Physik A+B

Dr. Hans-Günter Ludwig

Wintersemester 2019/20

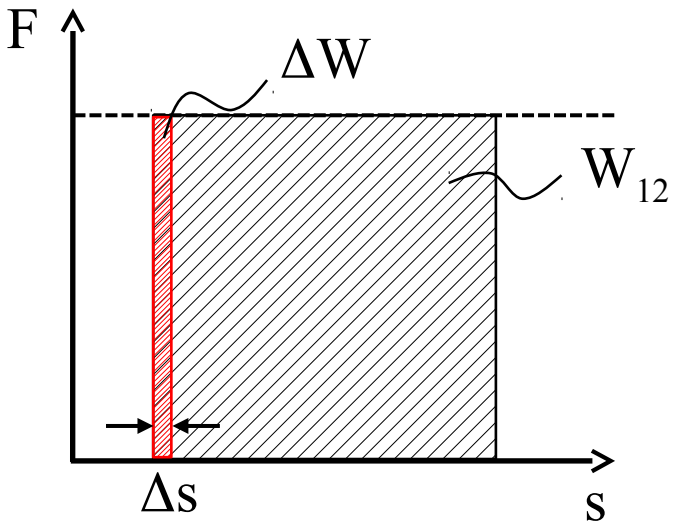
Kapitel 3:

Integralrechnung



Kraft-Weg-Diagramme

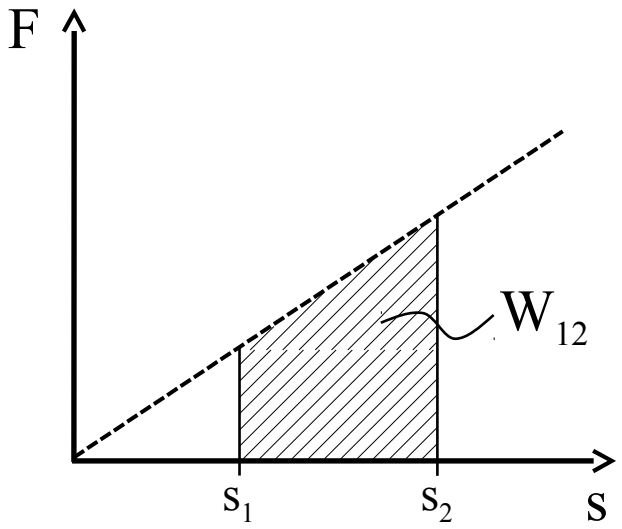
- Orts*un*abhängige Kräfte:



$$\Delta W = F \cdot \Delta s$$

$$W = F \cdot s$$

- Orts*ab*hängige Kräfte:



$$\mathrm{d}W = F\,\mathrm{d}s$$

$$W_{12} = \int_{s_1}^{s_2} F\,\mathrm{d}s$$

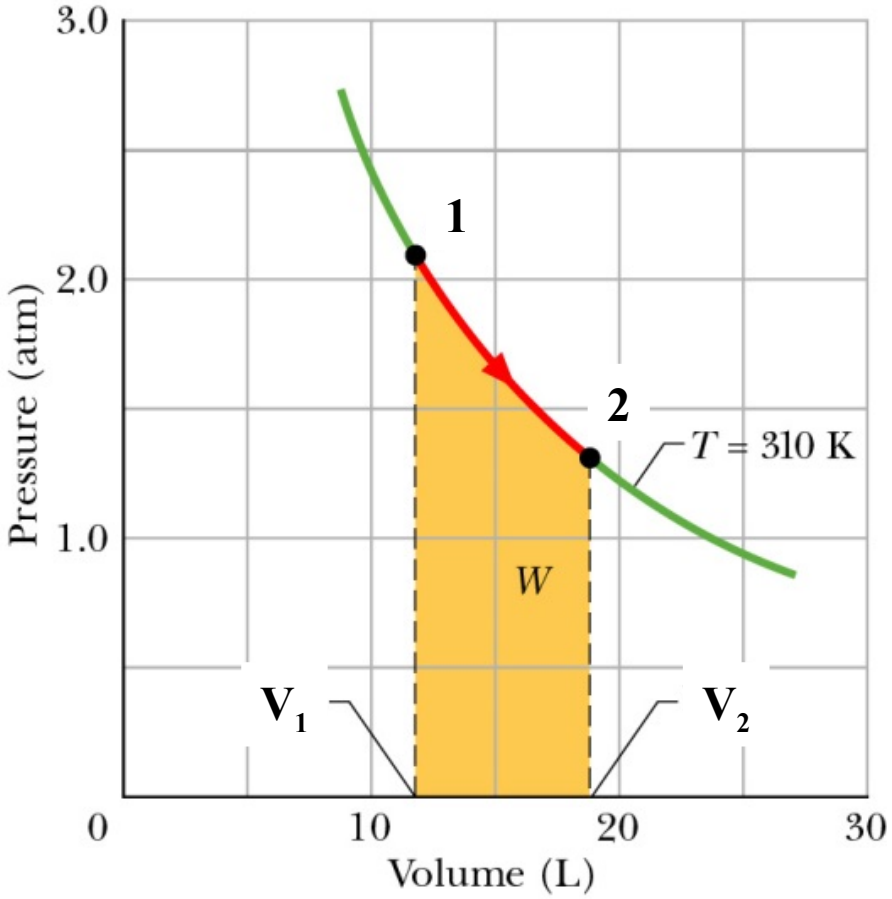
Zustandsänderungen und Arbeit

$$W_{12} = \int \mathrm{d}W = \int_{V_1}^{V_2} p\,\mathrm{d}V$$

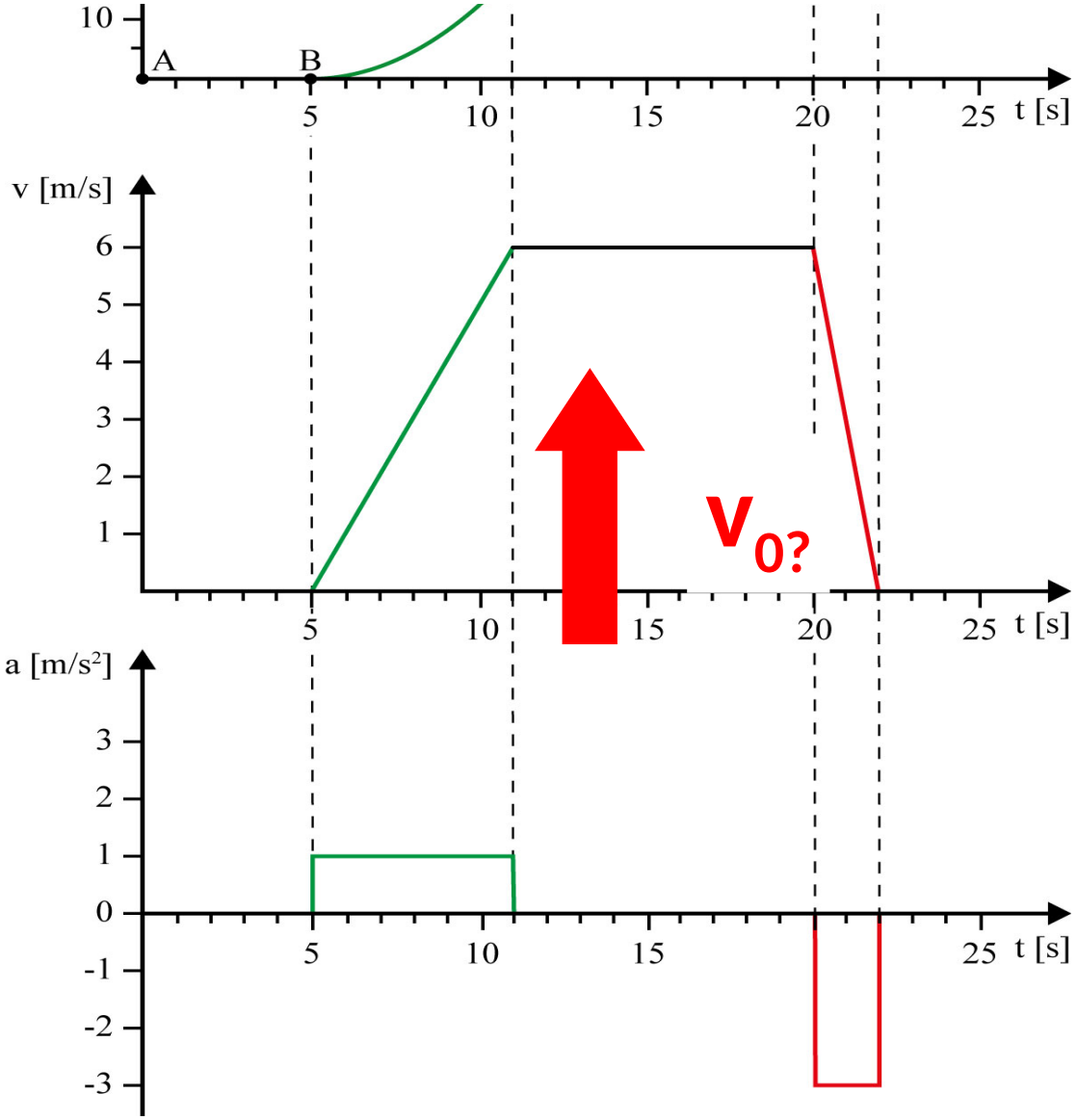
- D.h. die Arbeit W_{12}

  entspricht der Fläche unter der Kurve der

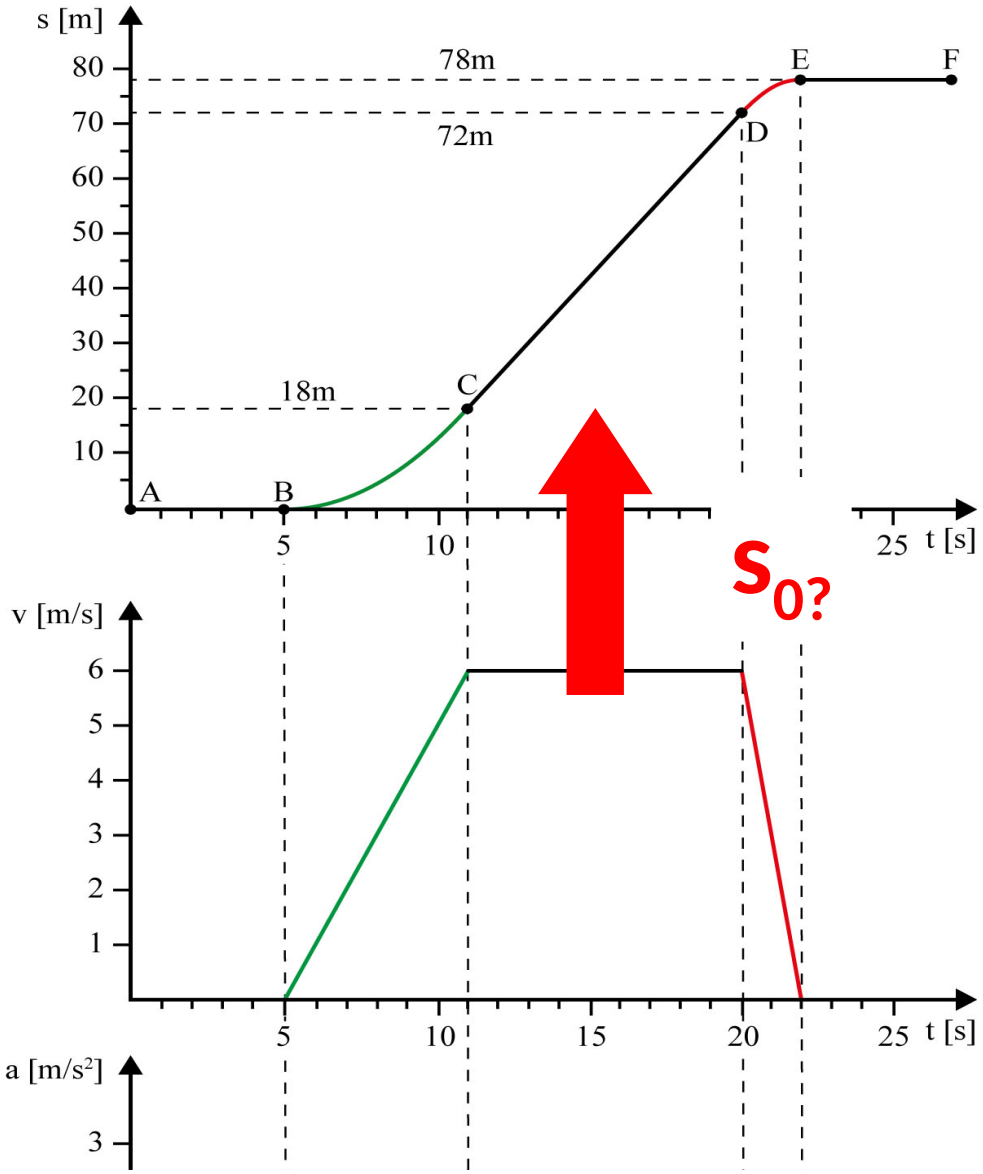
  Zustandsänderung im p,V-Diagramm.



Beschleunigungs-Zeit-Diagramm

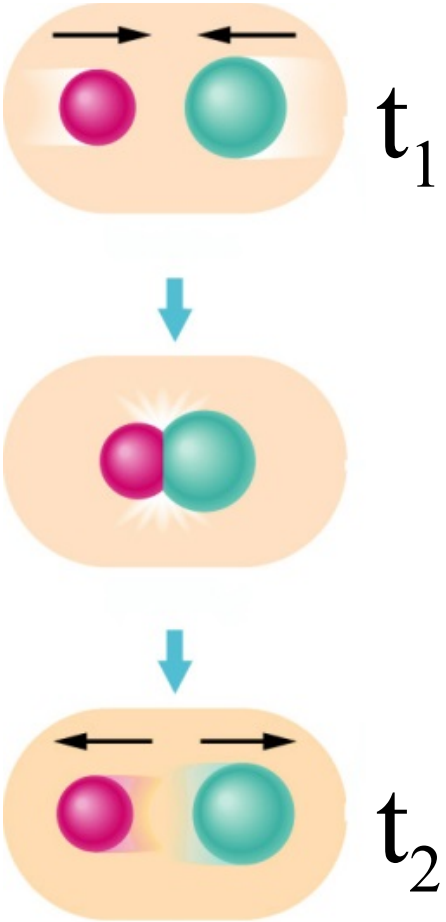


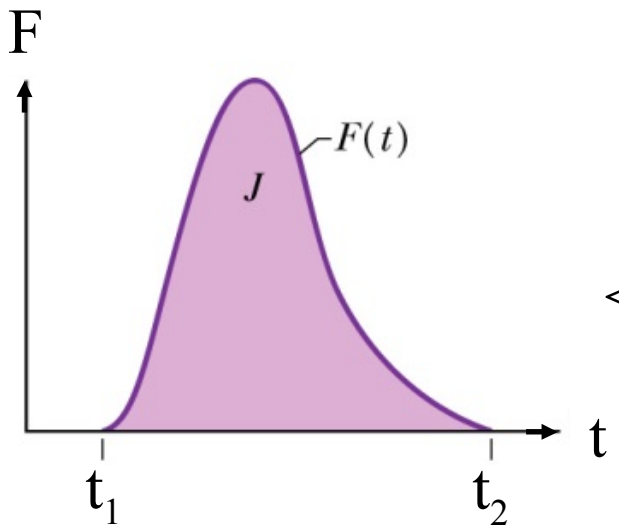
Geschwindigkeits-Zeit-Diagramm

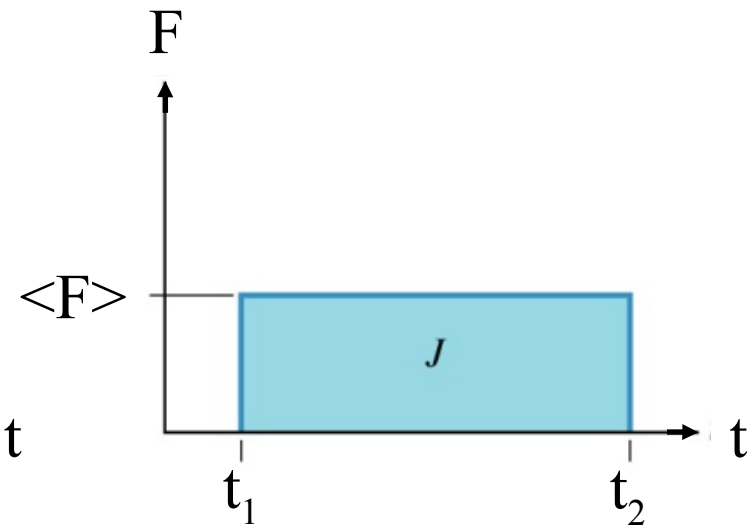


Kraftstoß

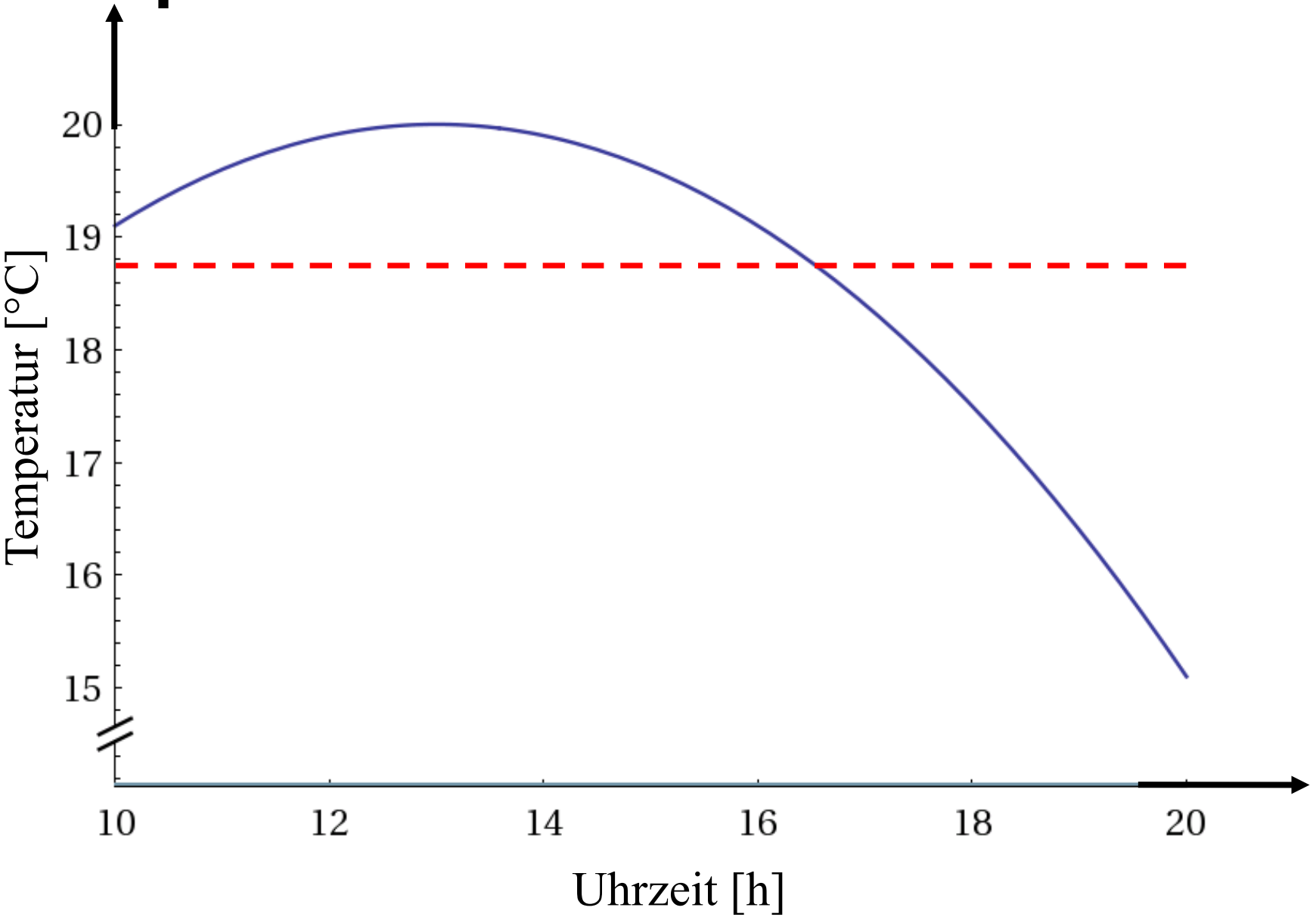
$$\Delta\vec{p} = \vec{J} := \int_{t_1}^{t_2} \vec{F}(t)\,\mathrm{d}t = <\vec{F}>\,\Delta t$$







Temperatur-Mittelwert




15 Minuten Pause!