Repetisjon I

1. $v = v_0 + at$

$s = v_0 t + \frac{1}{2} a t^2$

$s = \frac{(v_0 + v)}{2} \cdot t$

$v^2 - v_0^2 = 2as$

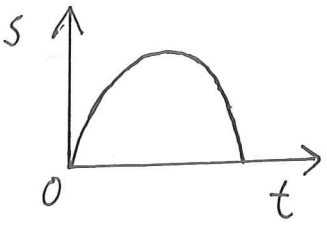
Bevegelseslikningene

Tegn figur!

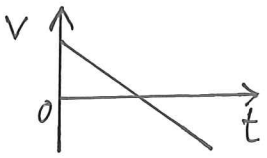
fritt fall: $g = 9{,}81 \frac{m}{s^2}$ på Jorda

$\frac{km}{h} = \frac{1000\,m}{3600\,s}$

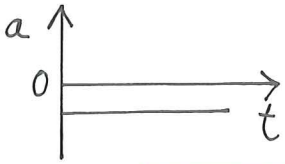
posisjonsgraf



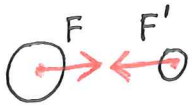
fartsgraf



aks. graf



1.332,351 (347)

2. Newtons 3. lov: $F' = F$ og 

(G, U, N, S, R, F)

N's 2. lov: $\sum F = ma$

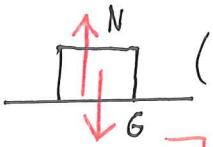
N's 1. lov: $\sum F = 0$ ($a = 0$)

Tegn figur med krefter!

$\overset{+}{\Rightarrow}$

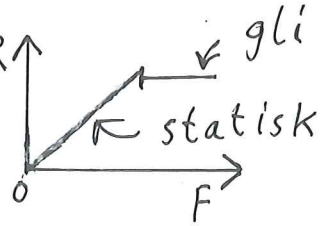
$F = kx$ (fjær)

$N = kg \cdot \frac{m}{s^2} = \frac{kg \cdot m}{s \cdot s}$ $\left(\frac{m}{s^2} = \frac{N}{kg}\right)$



(flatt)

$R = \mu N$



2.322,332,345,348(358,359)

3. Vitenskapelig metode:

Formuler problem. Gjett. Finn konsekvenser. Test. Revider. Lag enkel lov.

Måleusikkerhet: $X = \bar{X} \pm \delta X$

$\delta X = \frac{X_{max} - X_{min}}{2}$

$\bar{X}$: middelverdi

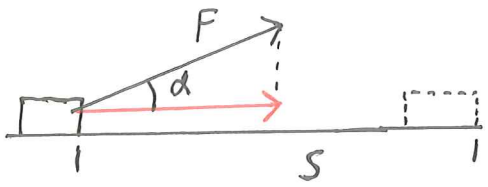
δX: absolutt u.

$\frac{\delta X}{\bar{X}}$ relativ u.

3.317

To siffer ekstra i mellomregninger

4. Arbeid: $W = F \cdot s \cdot \cos\alpha$

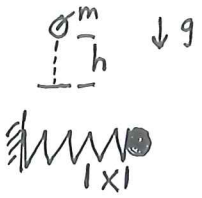


Energi

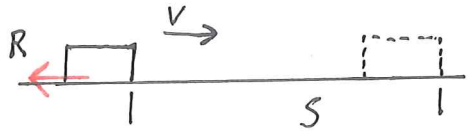
$E_k = \frac{1}{2}mv^2$

$E_p = mgh$

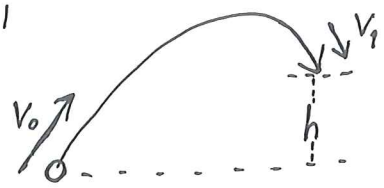
$E_p = \frac{1}{2}kx^2$



$W_f = R \cdot s$

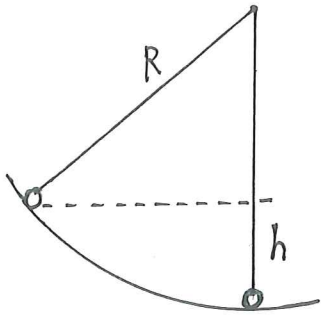


Mekanisk energi i tyngdefelt



$E_0 = E_1$

$E_{k0} + E_{p0} = E_{k1} + E_{p1}$



Effekt: $P = \frac{W}{t} = \frac{E}{t}$

$1\,kWh = 1000\,W \cdot 3600\,s = 3{,}6 \cdot 10^6\,J$

Virkningsgrad: $\eta = \frac{E_{nyttbar}}{E_{tilført}}$

[4.342,348,355]

5. Bevegelsesmengde: $p = mv$

Alle støt: $m_A v_A + m_B v_B = m_A v_{A0} + m_B v_{B0}$

Elastisk støt: $\frac{1}{2}m_A v_{A0}^2 + \frac{1}{2}m_B v_{B0}^2 = \frac{1}{2}m_A v_A^2 + \frac{1}{2}m_B v_B^2$

$[\, v_{A0} + v_{B0} = v_A + v_B \,]$ sentralt el. støt

$$\sum F = \frac{\Delta p}{\Delta t} = \frac{mv - mv_0}{\Delta t}$$

Impuls: $I = F \cdot t$

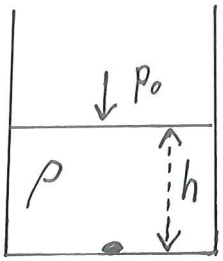
Impulsloven: $I_{\sum F} = \sum F \Delta t = mv - mv_0$

[5.305,313,324,328]

6. massetetthet: $\rho = \frac{m}{V}$

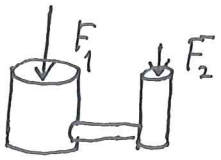
trykk: $p = \frac{F}{A}$

hydrostatisk trykk: $p = p_0 + \rho g h$ $(p_0 = 101\,kPa)$

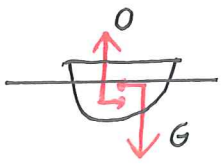


Pascals lov: p likt overalt i tett "boks".

$$\frac{F_1}{F_2} = \frac{A_1}{A_2}$$



oppdrift: $O = m_{FV} \cdot g = \rho_v \cdot V_{FV} \cdot g$



$\Sigma F = 0$

$O = G$

$T = 273K + t$ Absolutt temperatur

t: °C

$E_k = \frac{3}{2}kT$

Tilstandslikningen: $\frac{p_1 V_1}{T_1} = \frac{p_2 V_2}{T_2}$

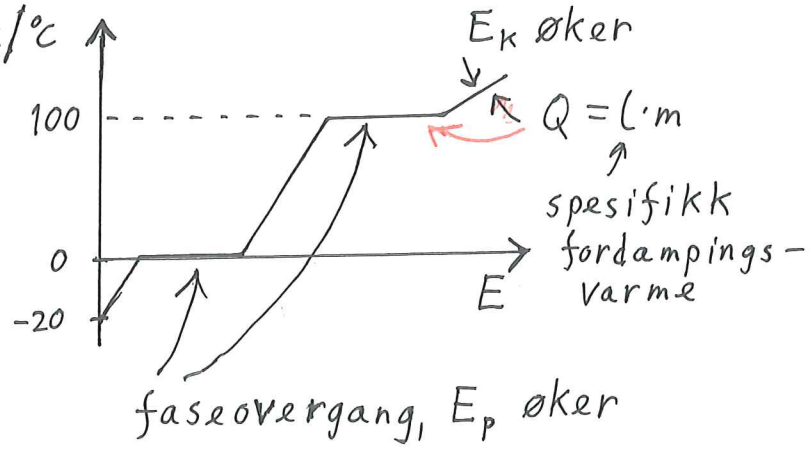
$pV = NkT$

6.304, 316, 324, 331, 343, 348, 355

7. Indre energi

E_p E_k

Q ⇒ varme — pga. Temp. forskjell



Termofysikkens 1. lov: $\Delta U = Q + W$

adiabatisk: $Q = 0$

$p = konst. \Rightarrow W = p \cdot \Delta V$

(spesifikk) varmekapasitet: $Q = c \cdot m \cdot \Delta t$

$Q = C \cdot \Delta t$

Energiloven: E_{tot} uendret

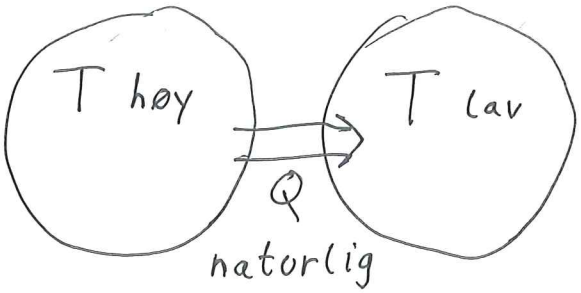
avgitt varme = mottatt varme

$Q_{avg.} = Q_{mott.}$

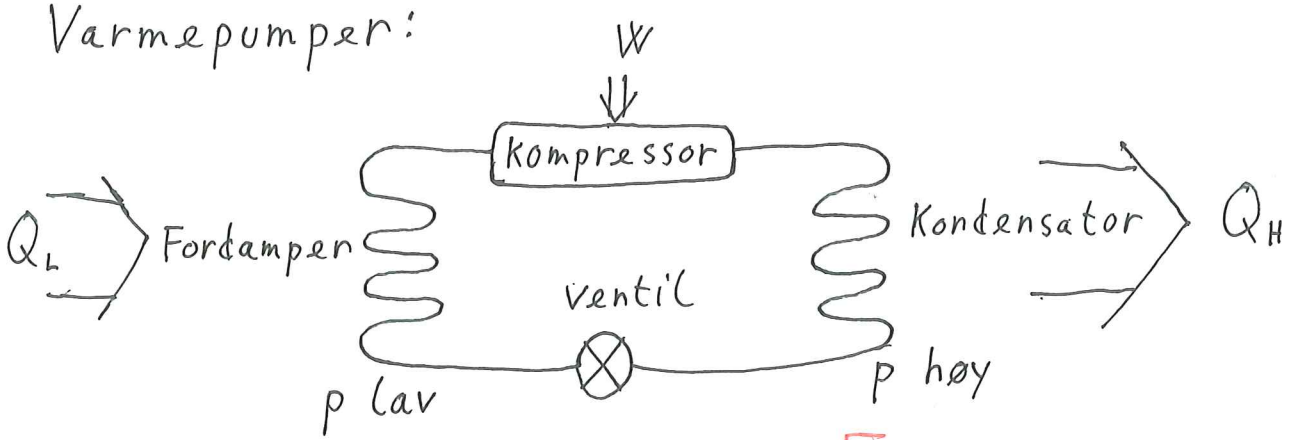
Energikvalitet: E_K høy

Q lav

Termofysikkens 2. lov:



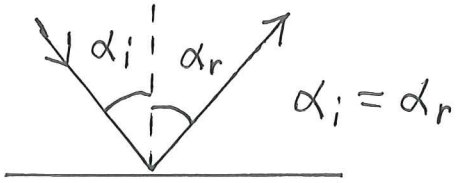
Varmepumper:



$Q_H = Q_L + W$

[7.309, 318, 335, 345, 353]

8.

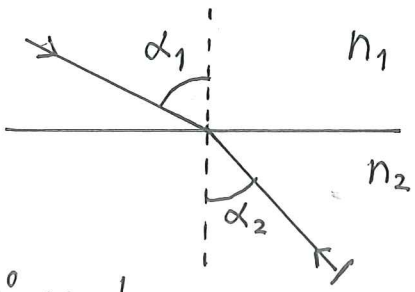


$\alpha_i = \alpha_r$

Snells lov:

$n_1 \cdot \sin\alpha_1 = n_2 \cdot \sin\alpha_2$

n varierer litt med fargen på lyset



$n = \frac{c_0}{c}$

$\alpha_1 = 90°$ ved totalrefleksjon

[8.304, 312, 315]