

Fasit

Kapittel 1

- 1 $\frac{\Delta L}{L} = 0,48 \cdot 10^{-3}$
 - 2 $\Delta L = 6,5 \text{ mm}$
 - 3 Vi ser bort fra ledd av andre orden fordi $\alpha^2 \ll \alpha$.
 - 4 $\Delta A = 65 \text{ mm}^2$
 - 5 $d = 3,006 \text{ cm}$
 - 6 $\frac{dA}{A} = 0,2 \%$
 - 7 a) $\Delta T = 56 \text{ K}$ b) $\Delta T = -74 \text{ K}$
 - 8 b) $L_B = 3,50 \text{ m}$
 - 9 Minustegn, fordi massetettheten øker når temperaturen faller.
 - 10 $\Delta V = 3,6 \text{ cm}^3$
 - 11 $\Delta V = 5,9 \text{ cm}^3$ $\frac{\Delta \rho}{\rho} = 0,17 \%$
 - 12 $\frac{\Delta A}{A} = 0,36 \%$ $\frac{\Delta d}{d} = 0,18 \%$
 $\frac{\Delta V}{V} = 0,54 \%$ $\frac{\Delta m}{m} = 0 \%$
- $\alpha = 18 \cdot 10^{-6} \text{ K}^{-1}$

Kapittel 2

- 1 $p = 2,3 \text{ kPa}$
- 2 $t = -78 \text{ }^\circ\text{C}$
- 3 $\Delta p = 0,2 \cdot 10^5 \text{ Pa}$
- 4 $p = 0,31 \cdot 10^5 \text{ Pa}$
- 5 $V = 2,3 \text{ m}^3$
- 6 $V = 79 \text{ cm}^3$
- 7 $V = 320 \text{ m}^3$
- 8 $V = 0,70 \text{ m}^3$
- 9 a) $\Delta V = 37 \text{ m}^3$ b) $\Delta p = 0,14 \cdot 10^5 \text{ Pa}$
- 10 $t = 477 \text{ }^\circ\text{C}$
- 11 a) $p = 3,6 \cdot 10^4 \text{ Pa}$ b) $\frac{N_{\text{Ar}}}{N_{\text{He}}} = 2,8$
- 12 $p = 59 \text{ kPa}$
- 13 $N = 1,2 \cdot 10^{21}$
- 14 a) $N_A = 6,5 \cdot 10^{23}$ c) $p = 1,5 \cdot 10^5 \text{ Pa}$
b) $p_B = 1,5 \cdot 10^5 \text{ Pa}$
- 15 $\Delta T = 71 \text{ K}$
- 16 $L = 0,53 \text{ } \mu\text{m}$
- 17 $N = 2,4 \cdot 10^6$
- 18 $\bar{E}_k = 1,2 \cdot 10^{-19} \text{ J}$, $v_{\text{rms}} = 8,6 \text{ km/s}$
- 19 a) $T_{\text{O}_2} = 80 \cdot 10^3 \text{ K}$ c) $T_{\text{H}_2} < T_{\text{O}_2}$
b) $E_k = 2,1 \cdot 10^{-19} \text{ J}$, som gir $T_{\text{H}_2} = 10 \cdot 10^3 \text{ K}$

20 a) $\bar{v} = 3,2 \text{ cm/s}$
 b) $v_{\text{rms}} = 3,4 \text{ cm/s}, v_{\text{rms}} > \bar{v}$

21 a) $U_A < U_B$ b) nei

22 a) $U = 22 \text{ kJ}$ b) $U = \frac{5}{2} pV$ c) $\Delta U = 1,7 \text{ kJ}$

23 $\Delta U = 0$

16 28 %

17 a) $\Phi = 0,46 \text{ kW/m}^2$ b) $\Phi = 4,6 \text{ MW/m}^2$

18 $A = 41 \text{ mm}^2$

19 $T = 389 \text{ K}$

20 $r \approx 100 r_{\text{sola}}$

Kapittel 3

1 a) $\frac{\Delta T}{\Delta x} = 400 \text{ K/m}$ c) $t = 110 \text{ }^\circ\text{C}$

b) $\Phi = 31 \text{ W}$

2 Den temperaturen som er lik temperaturen i fingrene.

3 a) $\Phi = 1,1 \text{ kW}$ b) $\Phi = 1,1 \text{ kW}$

4 $\Delta x = 6 \text{ cm}$

5 $t = 101,5 \text{ }^\circ\text{C}$

6 a) $\Delta x = 1,9 \text{ cm}$ b) $\Phi = 2,8 \text{ kW}$

7 $t = 1 \text{ min}$

8 a) $\Phi = 310 \text{ W}$ b) $t = 51,3 \text{ }^\circ\text{C}$

9 a) $T = 59 \text{ }^\circ\text{C}$ b) $\Phi = 130 \text{ W}$

10 $\Delta\Phi = 125 \text{ W}$

11 a) $k = 0,85 \text{ W/Km}^2$ c) $\Phi = 300 \text{ W}$
 b) $K = 0,55 \text{ W/Km}^2$

12 a) $\Phi = 49 \text{ W}$ c) $K = 1,4 \text{ W/Km}^2$
 b) $t_i = 7,7 \text{ }^\circ\text{C}, t_u = -8,8 \text{ }^\circ\text{C}$

13 a) $Q = 3,1 \text{ kWh}$ b) $Q = 3,4 \text{ kWh}$

14 $Q = 0,74 \text{ kWh}$

15 $K = 0,96 \text{ kW/Km}^2$

Kapittel 4

1 a) $W > 0$ b) $Q = 0$ c) $dU = W + Q > 0$

2 (avhengig av valg av system)

3 a) $\Delta V = 2,6 \cdot 10^{-3} \text{ m}^3$ b) $W = 0,29 \text{ kJ}$

4 a) $T_2 = 500 \text{ K}$ c) ΔU_{maks} når stemplet er fast
 b) $W = 8,00 \text{ kJ}$

5 a) $W_1 = p_2 (V_2 - V_1)$ c) $\Delta U = W_1, Q = 0$
 b) $W_2 = p_1 (V_2 - V_1)$

6 $\Delta T = 0,070 \text{ K}$

7 $W = 33 \text{ kJ}$

8 a) $W = 135 \text{ J}$ c) $U_2 = 320 \text{ J}$
 b) $Q = -230 \text{ J}$ d) $Q_1 = -85 \text{ J}, Q_2 = 230 \text{ J}$

9 a) $W = -0,60 \text{ kJ}, Q = 1025 \text{ J} \approx 1,0 \text{ kJ}$

