

TBM 2E, 12.5.2011

①

$$a) p = 50\% = 0.5, \quad q = p+1 = 1+0.5 = \underline{\underline{1.5}}$$

$$b) p = -50\% = -0.5, \quad q = p+1 = \underline{\underline{0.5}}$$

$$c) p = 1.25\% = 0.00125$$

$$q = p+1 = \underline{\underline{1.00125}}$$

$$d) p = 900\% = 9, \quad q = p+1 = \underline{\underline{10}}$$

②

$$L = 4.83\text{m}, \quad A = 2.4\text{m}^2, \quad V = 70\text{l}$$

$$q = 1:50 = \frac{1}{50} = 0.02$$

$$L' = q \cdot L = 0.0966\text{m} = \underline{\underline{9.66\text{cm}}}$$

$$A' = q^2 A = 0.000960\text{m}^2 = \underline{\underline{9.6\text{cm}^2}}$$

$$V' = q^3 V = 0.000560\text{l} = \underline{\underline{0.56\text{cm}^3}} = \underline{\underline{560\text{mm}^3}}$$

$$= \underline{\underline{0.56\text{ml} = 560\mu\text{l}}}$$

③

$$V = 15'000\text{m}^3, \quad A = 4\text{m}^2$$

$$V' = 15\text{cm}^3$$

$$q^3 = \frac{V'}{V} = \frac{15\text{cm}^3}{15'000\text{m}^3} = \frac{15\text{cm}^3}{15'000'000'000\text{cm}^3}$$

$$q^3 = \frac{1}{1'000'000'000} \quad \Bigg/ \quad \sqrt[3]{\quad}$$

$$q = \frac{1}{1000} = 1:1000$$

$$A' = q^2 \cdot A = \left(\frac{1}{1000}\right)^2 \cdot 4\text{m}^2 = 0.000004\text{m}^2$$

$$= 0.04\text{cm}^2$$

$$= 4\text{mm}^2$$

④ $A' = 30\text{m} \cdot 15\text{m} = 450\text{m}^2$ $0.01494\dots = \frac{1}{87}$

$A = 3.406'050\text{km}^2$

a) $q^2 = \frac{A'}{A} = \frac{450\text{m}^2}{3.406'050\text{km}^2} = 0.000'132'118$

$q^2 = \frac{450\text{m}^2}{3'406'050\text{m}^2} = \frac{1}{7'569}$

$q = \sqrt{\frac{1}{7'569}} = 1:87$

b) $L = 18.5\text{m}$

$L' = L \cdot q = 18.5\text{m} \cdot \frac{1}{87} \approx 0.2126\text{m}$

$= \underline{\underline{21.26\text{cm}}}$

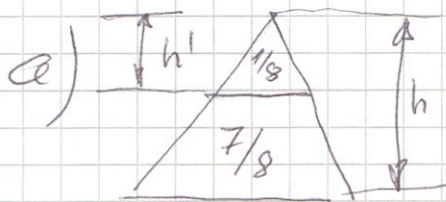
c) $\frac{m'}{m} = q^3$ (wie Volumen)

$m' = m \cdot q^3 = 84'000\text{kg} \cdot \left(\frac{1}{87}\right)^3$

$\approx 0.1276\text{kg} = \underline{\underline{127.6\text{g}}}$

→ Total 6 Punkte

⑤ $h = 150\text{m}$



$\frac{V'}{V} = q^3 = \frac{1}{8}$

$q = \frac{1}{2}$

$h' = q \cdot h = \frac{1}{2}h = \underline{\underline{75\text{m}}}$

b) $\frac{V'}{V} = 10\% = \frac{1}{10} = q^3 \Rightarrow q = \sqrt[3]{\frac{1}{10}} \approx 0.464$

$h' = q \cdot h \approx 69.62\text{m}$

$h - h' = \underline{\underline{80.38\text{m}}}$

$$\textcircled{6} \quad P' = 19'405.98. - , \quad q_1 = 1.1, \quad q_2 = 0.9$$

$$P' = P \cdot q_1^3 \cdot q_2^3 = P \cdot (1.1)^3 \cdot (0.9)^3$$

$$P = \frac{P'}{q_1^3 \cdot q_2^3} = \frac{19'405.98}{(1.1)^3 \cdot (0.9)^3} = \underline{\underline{20'000. -}}$$

$$\textcircled{7} \quad P = 100. - , \quad p = 2\% = 0.02$$

$$q = 1 + p = 1.02$$

$$a) \quad P' = P \cdot q^{20} = 100 \cdot (1.02)^{20} \\ = \underline{\underline{148.59 \text{ Fr.}}}$$

$$b) \quad P' = P \cdot q^{100} = \underline{\underline{724.46 \text{ Fr.}}}$$

$$\textcircled{8} \quad P = 200. - \quad / \quad P' = 187.50$$

$$P' = P(1+p)(1-p)$$

$$P' = P(1-p^2)$$

~~$$P' = P - Pp^2$$~~

$$\frac{P'}{P} = 1 - p^2 \quad | + p^2 - \frac{P'}{P}$$

$$p^2 = 1 - \frac{P'}{P}$$

$$p = \sqrt{1 - \frac{P'}{P}} = 0.25 = \underline{\underline{25\%}}$$