(2) Geg: $\ell = 1.0\,m$
$d = 5\,mm = 5 \cdot 10^{-3}\,m$
$m = 175\,g = 0.175\,kg$

Ges: Dichte

L: $\rho = \frac{m}{V} = \frac{m}{\pi \left(\frac{d}{2}\right)^2 \cdot \ell} = 8914.36\ \frac{kg}{m^3}$

→ Kupfer

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(3) Geg: $\ell = 6\,m$
$b = 5\,m$
$d = 0.3\,m$

Ges: $m(Eis)$, $V(Reservoir)$

$\rho = \frac{m}{V} \rightarrow m(Eis) = \rho(Eis) \cdot V(Eis)$
$= 920\ kg/m^3 \cdot (6 \cdot 5 \cdot 0.3)\,m^3 = 8280\,kg$
$= 8.28 \cdot 10^3\,kg$

$m(Reservoir) = \rho(Wasser) \cdot V$
$= 1025\ kg/m^3 \cdot 9\,m^3 = 9225\,kg$
$= 9.23 \cdot 10^3\,kg$

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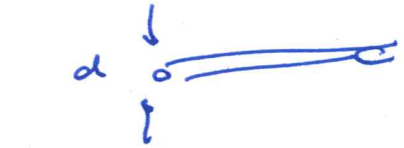
(4) Geg: $\ell = 100\,m$
$\rho(Kupfer) = 8900\ \frac{kg}{m^3}$
$d = 2\,mm = 2 \cdot 10^{-3}\,m$



Ges: m

$\rho = \frac{m}{V} \Rightarrow m = \rho \cdot V$
$= \rho \cdot \pi \cdot \left(\frac{d}{2}\right)^2 \cdot \ell$
$= 8900\ \frac{kg}{m^3} \cdot 3.141 \cdot \left(10^{-3}\right)^2 \cdot 100\,m$
$= 2.79569\,kg$
$= 2.80\,kg$

(5) Geg: $m = 80\,kg$

$\rho(Blut) = 1060 \frac{kg}{m^3}$

$V = 5.8\,l = 0.0058\,m^3 \quad (= 5.8 \cdot 10^{-3}\,m^3)$

Ges: m, %

L.: $\rho = \frac{m}{V} \rightarrow m = \rho \cdot V$

$= 1060 \frac{kg}{m^3} \cdot 0.0058\,m^3$

$= 6.148 = \underline{6.15\,kg}$

$\frac{m(Blut)}{m(Körper)} = \frac{6.148}{80} = 0.07685$

$\hat{=} \underline{7.68\,\%}$

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(6) Geg: $m = 300\,g \quad (= 0.3\,kg)$

$\rho = 11.3\,g/cm^3 \quad (= 11300\,kg/m^3)$

Ges: V (in cm^3!)

L.: $\rho = \frac{m}{V} \rightarrow V = \frac{m}{\rho} = 26.5486\,cm^3$

$= \underline{26.55\,cm^3}$

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(7) Geg: $m(Gold) = 4.4\,g = 4.4 \cdot 10^{-3}\,kg$

$A = 55\,mm^2 = 55 \cdot 10^{-6}\,m^2$; $\rho(Au) = 19300 \frac{kg}{cm^3}$

Ges: h

L.: $m(Blatt) = \frac{m(Gold)}{1000} = 4.4 \cdot 10^{-6}\,kg$

$\rho = \frac{m(Blatt)}{V} = \frac{m(Blatt)}{A \cdot h}$

$\rightarrow h = \frac{m(Blatt)}{A \cdot \rho} = \frac{4.4 \cdot 10^{-6}\,kg}{55 \cdot 10^{-6}\,m^2 \cdot 19300 \frac{kg}{m^3}}$

$= 0.000004145\,m = \underline{4.15 \cdot 10^{-6}\,m}$

$\therefore$

(11) Geg.: $e = 4.2\,m$, $s = 3.9\,m$, $h = 2.8\,m$

$\rho(Luft) = 1.14\ kg/m^3$

Ges.: $m(Luft)$

L: $\rho = \frac{m}{V} \Rightarrow m = \rho \cdot V$

$= 1.14\ kg/m^3 \cdot 4.2 \cdot 3.9 \cdot 2.8\ m^3$

$= \underline{52.29\ kg}$

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(12) 

Geg.: $V = 1\,m^3$, $m = 100\ kg$

$Dichte(Glas) = 2500\ kg/m^3$

Ges.:

L: $\rho = \frac{m}{V} \rightarrow m(Glas) = 2500 \cdot 1 = 2500\ kg$

$\frac{m(Wolle)}{m(Glas)} = \frac{100}{2500} = 0.04$ d.h. 4%.

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(13) Geg.: $m(Holz) = 30\,g = 0.030\ kg$

$m(Pb) = 0.400\ kg$

$\rho(Blei) = 11.300\ kg/m^3$; $V_{Total} = 76\,cm^3 = 76 \cdot 10^{-6}\,m^3 = 7.6 \cdot 10^{-5}\,m^3$

Ges.: $\rho(Holz)$

L: $\rho = \frac{m}{V} \rightarrow V = \frac{m}{\rho}$

$V_{Total} = \frac{m(Blei)}{\rho(Blei)} + \frac{m(Holz)}{\rho(Holz)}$

$\rightarrow \rho(Holz) = \frac{m(Holz)}{V_{Tot} - \frac{m(Blei)}{\rho(Blei)}}$

$= \underline{738.88\ kg/m^3}$

V

(14) Geg: $m(\text{Leer}) = 38.4\,g = 0.0384\,kg$

$m(\text{Wasser} + P_Y) = 119.7\,g = 0.1197\,kg$

$m(\text{Spiritus} + P_Y) = 103.1\,g = 0.1031\,g$; $\rho(H_2O) = 1000\,\frac{kg}{m^3}$

Ges: $\rho(\text{Spiritus})$

L: $m(\text{Wasser}) = 119.7 - 38.4 = 81.3\,g = 0.0813\,kg$

$m(\text{Spiritus}) = 0.1031 - 0.0384 = 0.0647\,kg$

$$\rho = \frac{m}{V} \rightarrow V = \frac{m}{\rho}$$

jeweils gleiche Volumina !

$$\rightarrow V(\text{Wasser}) = V(\text{Spiritus})$$

$$\frac{m(\text{Wasser})}{\rho(\text{Wasser})} = \frac{m(\text{Spiritus})}{\rho(\text{Spiritus})}$$

$$\rightarrow \rho(\text{Spiritus}) = \frac{m(\text{Spiritus}) \cdot \rho(\text{Wasser})}{m(\text{Wasser})}$$

$$= \frac{0.0647 \cdot 1000}{0.0813} = 795.82\,\frac{kg}{m^3}$$

(15) x streichen !

(16) a) x

b) $m(\text{Sonne}) \quad 1989000 \cdot 10^{21}\,\text{Tonnen} = 1.99 \cdot 10^{6} \cdot 10^{24}\,kg = 1.99 \cdot 10^{30}\,kg$

$V(\text{Erde}) = 1080 \cdot 10^{9}\,km^3 = 1.08 \cdot 10^{12}\,km^3 = 1.08 \cdot 10^{12}(1000m)^3 = 1.08 \cdot 10^{21}\,m^3$

$$\rho = \frac{m_S}{V_E} = \frac{1.99 \cdot 10^{30}}{1.08 \cdot 10^{21}} = 1.84 \cdot 10^{9}\,\frac{kg}{m^3}$$

c) $1\,m^3 \Rightarrow 1.84 \cdot 10^{9}\,kg$

$1\,cm^3 \rightarrow (100)^3$ mal weniger : $1.84 \cdot 10^{3}\,kg \sim$ 2 Tonnen !