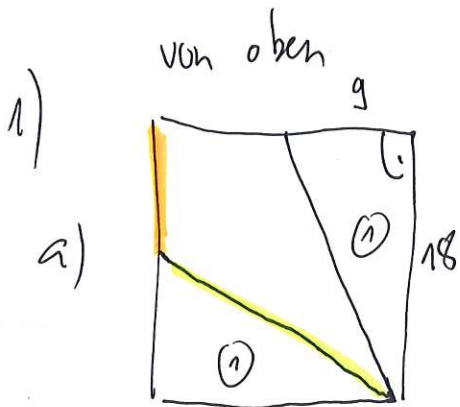


# 2K Pythagoras 3D

## Lösungsweg



$$\begin{aligned} & \text{---} : 4x : 4x \cdot 9 \text{ cm} & = 36 \text{ cm} \\ & \text{---} : 4x : 4x \sqrt{18^2 + 9^2} \text{ cm} \approx 80.70 \text{ cm} \\ & \text{Kante} : 4x : 4x \cdot 18 \text{ cm} & = 72 \text{ cm} \\ & \hline & \text{Summe} & = \underline{\underline{188.70 \text{ cm}}} \end{aligned}$$

b)  $A = \square - 2 \cdot \text{①}$

$$\underline{\underline{A}} = (18 \text{ cm})^2 - 2 \cdot \frac{18 \text{ cm} \cdot 9 \text{ cm}}{2} = 324 \text{ cm}^2 - 162 \text{ cm}^2 = \underline{\underline{162 \text{ cm}^2}}$$

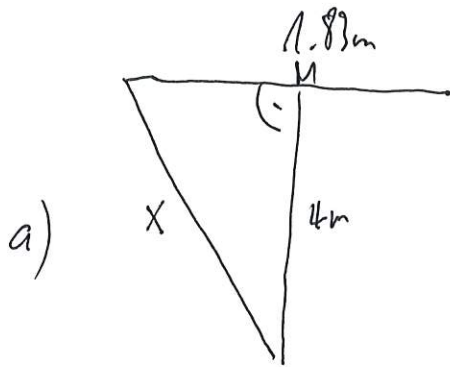
3)  $\text{Kante} = \frac{336 \text{ cm}}{n} = \underline{\underline{28 \text{ cm}}}$  (Ein Würfel hat 12 Kanten!)

a)  $\underline{\underline{d_3}} = s \cdot \sqrt{2} = 28 \text{ cm} \cdot \sqrt{2} \approx \underline{\underline{39.60 \text{ cm}}}$

b)  $\underline{\underline{d_R}} = s \cdot \sqrt{3} = 28 \text{ cm} \cdot \sqrt{3} \approx \underline{\underline{48.50 \text{ cm}}}$

c)  $\underline{\underline{S}} = 6 \cdot \square = 6 \cdot (28 \text{ cm})^2 = \underline{\underline{4704 \text{ cm}^2}}$

4)



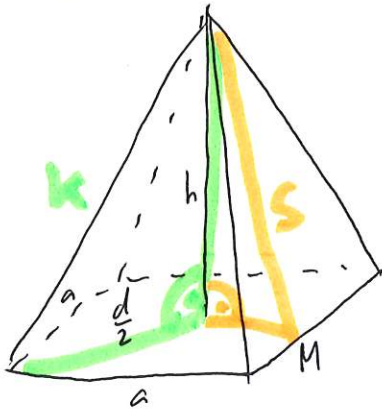
$$\underline{x} = \sqrt{(4\text{m})^2 + \left(\frac{1.83\text{m}}{2}\right)^2} \approx \underline{\underline{4.10\text{m}}}$$

a)

b) Quader mit  $4\text{m}$ ,  $\frac{1.83\text{m}}{2}$ ,  $1.22\text{m}$  langen Kanten. die Raumdiagonale

$$\underline{d} = \sqrt{4^2 + \left(\frac{1.83}{2}\right)^2 + 1.22^2} \text{ m} \approx \underline{\underline{4.28\text{m}}}$$

5)



$$a) s = \sqrt{h^2 + \left(\frac{a}{2}\right)^2}$$

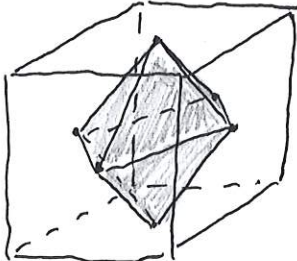
$$\underline{s} = \sqrt{(10\text{m})^2 + \left(\frac{22\text{m}}{2}\right)^2} \approx \underline{\underline{51.20\text{m}}}$$

$$b) k = \sqrt{h^2 + \left(\frac{d}{2}\right)^2} \approx \underline{\underline{52.26\text{m}}}$$

$$\underline{\frac{d}{2}} = \frac{a \cdot \sqrt{2}}{2} = \frac{22\text{m} \cdot \sqrt{2}}{2} = \underline{\underline{15.56\text{m}}}$$

$$c) \underline{\underline{A_{ABC}}} = \frac{a \cdot s}{2} = \frac{22\text{m} \cdot 51.20\text{m}}{2} = \underline{\underline{563.15\text{m}^2}}$$

6)



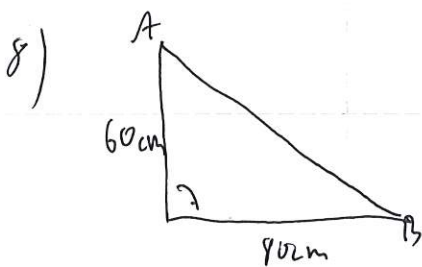
Die Ecke D beim Blatt ist weiter links, d.h. sie ist nicht sichtbar.

7) a)  $U = \text{Bodendiagonale} + \text{Höhe} + \text{Raumdiagonale}$

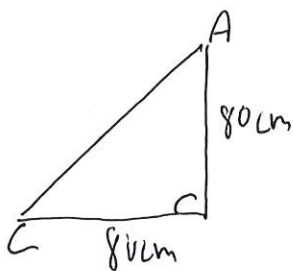
$$U = \sqrt{90^2 + 74^2} \text{ cm} + 55 \text{ cm} + \sqrt{90^2 + 74^2 + 55^2} \text{ cm}$$

$$\underline{\underline{U \approx 109.99 \text{ cm} + 55 \text{ cm} + 122.07 \text{ cm} \approx 286.05 \text{ cm}}}$$

$$\underline{\underline{b) A = \frac{\text{Bodendiagonale} \cdot \text{Höhe}}{2} = \frac{122.07 \text{ cm} \cdot 55 \text{ cm}}{2} \approx 3356.92 \text{ cm}^2}}$$



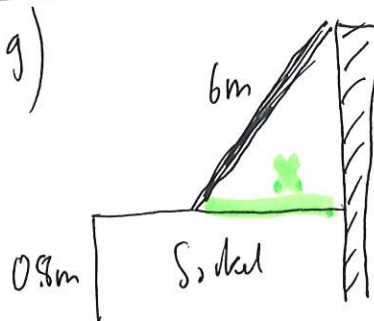
a)  $\underline{\underline{AB = \sqrt{60^2 + 90^2} \text{ cm} \approx 108 \text{ cm}}}$



b)  $\underline{\underline{AC = 80 \text{ cm} \cdot \sqrt{2} \approx 113.14 \text{ cm}}}$

c) AC ist Raumdiagonale ~~ist~~ im Quader mit den Kanten 80 cm, 80 cm, 20 cm!

$$\underline{\underline{AC = \sqrt{80^2 + 80^2 + 20^2} \text{ cm} \approx 114.91 \text{ cm}}}$$



a)  $4.7 \text{ m} - 0.8 \text{ m} = 3.9 \text{ m}$   
 b)  $4.7 \text{ m} - 2.4 \text{ m} = 2.3 \text{ m}$

a)  $\underline{\underline{x_1 = \sqrt{(6 \text{ m})^2 - (3.9 \text{ m})^2} \approx 4.56 \text{ m}}}$

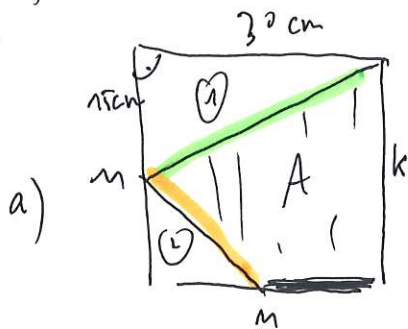
b)  $\underline{\underline{x_2 = \sqrt{(6 \text{ m})^2 - (2.3 \text{ m})^2} \approx 5.41 \text{ m}}}$

$$10) \cdot S = G \cdot \square \rightarrow \sqrt{S} = \frac{S}{G} = \frac{724 \text{ cm}^2}{6} = \underline{\underline{54 \text{ cm}^2}}$$

$$\cdot A = a^2 \rightarrow a = \sqrt{A} = \sqrt{54} \text{ cm} \approx \underline{\underline{7.35 \text{ cm}}}$$

$$\cdot d = a \cdot \sqrt{3} = 7.35 \text{ cm} \cdot \sqrt{3} \approx \underline{\underline{12.73 \text{ cm}}}$$

11) von oben



$$\text{green: } 2 \times = 2 \cdot \sqrt{30^2 + 15^2} \text{ cm} \approx 67.08 \text{ cm}$$

$$\text{yellow: } 2 \times = 2 \cdot 15 \text{ cm} \cdot \sqrt{2} \approx 42.43 \text{ cm}$$

$$\text{black: } 2 \times = 2 \cdot 15 \text{ cm} = 30.00 \text{ cm}$$

$$\text{G. Kante } k = 6 \cdot 30 \text{ cm} = 180 \text{ cm}$$

$$\underline{\underline{\text{Summe}}} = \underline{\underline{319.51 \text{ cm}}}$$

b)  $A = \square - \textcircled{1} - \textcircled{2}$

$$A = (30 \text{ cm})^2 - \frac{30 \text{ cm} \cdot 15 \text{ cm}}{2} - \frac{15 \text{ cm} \cdot 15 \text{ cm}}{2} = 900 \text{ cm}^2 - 225 \text{ cm}^2 - 112.5 \text{ cm}^2 \approx \underline{\underline{562.50 \text{ cm}^2}}$$

c)  $S = \text{Boden} + \text{Deckel} + 4 \text{ Rechtecke rundherum}$

$$S = \triangle A \cdot 2 + \begin{array}{|c|} \hline 15 \\ \hline \end{array} \begin{array}{|c|} \hline 30 \\ \hline \end{array} + \begin{array}{|c|} \hline 30 \\ \hline \end{array} \begin{array}{|c|} \hline 30 \\ \hline \end{array} + \begin{array}{|c|} \hline 37.54 \text{ cm} \\ \hline \end{array} \begin{array}{|c|} \hline 30 \\ \hline \end{array} + \begin{array}{|c|} \hline 21.21 \text{ cm} \\ \hline \end{array} \begin{array}{|c|} \hline 30 \\ \hline \end{array}$$

$$S = 2 \cdot 562.50 \text{ cm}^2 + 15 \text{ cm} \cdot 30 \text{ cm} + (30 \text{ cm})^2 + 30 \text{ cm} \cdot 37.54 \text{ cm} + 30 \text{ cm} \cdot 21.21 \text{ cm}$$

$$S = 1125.00 \text{ cm}^2 + 450 \text{ cm}^2 + 900 \text{ cm}^2 + 1006.20 \text{ cm}^2 + 636.40 \text{ cm}^2$$

$$S \approx \underline{\underline{4117.60 \text{ cm}^2}}$$

