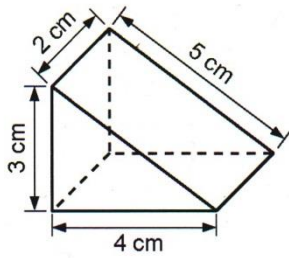


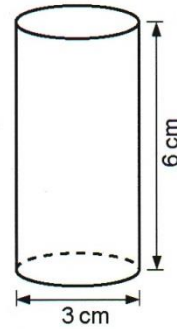
Klassenarbeit:

Volumenberechnung und Oberflächenberechnung bei Körpern

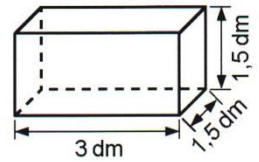
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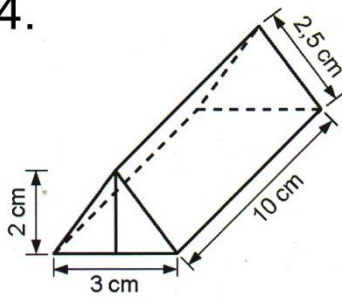
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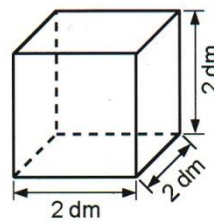
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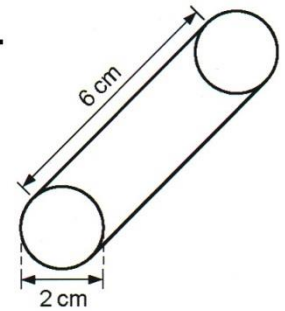
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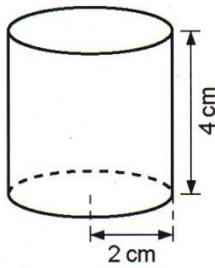
5.



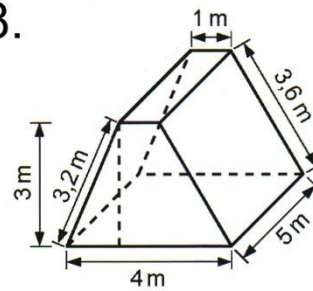
6.



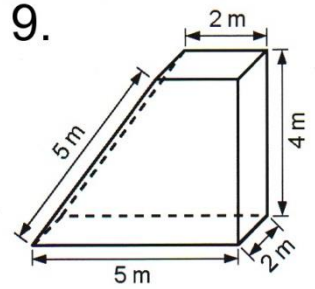
7.



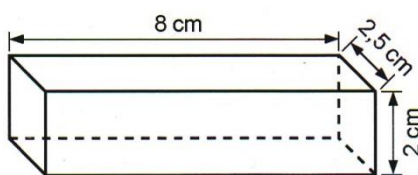
8.



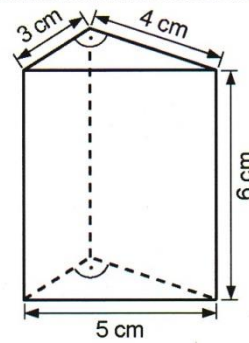
9.



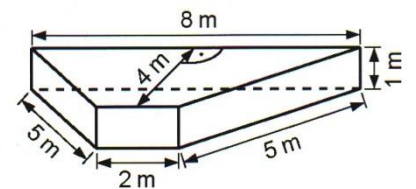
10.



11.



12.



Lösungen:

1. $V = 12 \text{ cm}^3$ $O = 36 \text{ cm}^2$
2. $V = 42,39 \text{ cm}^3$ $O = 79,56 \text{ cm}^2$
3. $V = 6,75 \text{ dm}^3$ $O = 22,5 \text{ dm}^2$
4. $V = 30 \text{ cm}^3$ $O = 86 \text{ cm}^2$
5. $V = 8 \text{ dm}^3$ $O = 24 \text{ dm}^2$
6. $V = 18,84$ $O = 43,96 \text{ cm}^2$
7. $V = 50,24 \text{ cm}^3$ $O = 75,36 \text{ cm}^2$
8. $V = 37,5 \text{ m}^3$ $O = 76 \text{ m}^2$
9. $V = 28 \text{ m}^3$ $O = 60 \text{ m}^2$
10. $V = 40 \text{ cm}^2$ $O = 82 \text{ cm}^2$
11. $V = 36 \text{ cm}^3$ $O = 84 \text{ cm}^2$
12. $V = 20 \text{ m}^3$ $O = 60 \text{ m}^2$

Lösungswege (handschriftlich)

Lösungen

Nr. 1)

1 Stunde
(Ohne Taschenrechner)

$$V_{\text{Dreiecksstange}} = A_G \cdot h$$

$$A_G = \frac{c \cdot h_c}{2} = \frac{4 \text{ cm} \cdot 3 \text{ cm}}{2} = \frac{12 \text{ cm}^2}{2} = \underline{\underline{6 \text{ cm}^2}}$$

$$V_D = A_G \cdot h = 6 \text{ cm}^2 \cdot 2 \text{ cm} = \underline{\underline{12 \text{ cm}^3}}$$

Nr. 2)

$$V_{\text{Dreiecksstange}} = 2 \cdot A_G + M_R$$

$$A_G = 6 \text{ cm}^2$$

$$\begin{aligned} M &= a \cdot b \\ &= 12 \text{ cm} \cdot 2 \text{ cm} \\ &= 24 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} V_{\text{Dreiecksstange}} &= 2 \cdot A_G + M \\ &= 2 \cdot 6 \text{ cm}^2 + 24 \text{ cm}^2 \\ &= 12 \text{ cm}^2 + 24 \text{ cm}^2 \\ &= \underline{\underline{36 \text{ cm}^2}} \end{aligned}$$

(Nr. 2)

$$V_{\text{Kreiszylinder}} = A_G \cdot h$$

$$\begin{aligned}
 A_G &= \pi \cdot r^2 \\
 &= \pi \cdot r \cdot r \\
 &= 3,14 \cdot 1,5 \text{ cm} \cdot 1,5 \text{ cm} \\
 &= 3,14 \cdot 2,25 \text{ cm}^2 \\
 &= \underline{7,0650 \text{ cm}^2}
 \end{aligned}$$

$$\begin{array}{r}
 \text{(NR)} \quad 3,14 \cdot 2,25 \\
 \hline
 628 \\
 628 \\
 \hline
 1570 \\
 \hline
 70650 \\
 1
 \end{array}$$

$$V_{\text{Kreiszylinder}} = A_G \cdot h$$

$$\begin{aligned}
 &= 7,0650 \text{ cm}^2 \cdot 6 \text{ cm} \\
 &= \underline{42,39 \text{ cm}^3}
 \end{aligned}$$

$$\begin{array}{r}
 7,0650 \cdot 6 \\
 \hline
 42,3900 \\
 1
 \end{array}$$

$$O_{\text{Kreiszylinder}} = 2 \cdot A_G + M$$

$$A_G = 7,0650 \text{ cm}^2$$

$$\begin{aligned}
 M &= a \cdot b \\
 &= 9,42 \text{ cm} \cdot 6 \text{ cm} \\
 &= \underline{56,52 \text{ cm}^2}
 \end{aligned}$$

$$\begin{aligned}
 a = u &= d \cdot \pi \\
 &= 3 \text{ cm} \cdot 3,14 \\
 &= 9,42 \text{ cm}
 \end{aligned}$$

$$O_{\text{Kreiszylinder}} = 2 \cdot A_G + M$$

$$\begin{aligned}
 &= 2 \cdot 7,0650 \text{ cm}^2 + 56,52 \text{ cm}^2 \\
 &= 14,13 \text{ cm}^2 + 56,52 \text{ cm}^2 \\
 &= \underline{70,65 \text{ cm}^2}
 \end{aligned}$$

$$\begin{array}{r}
 \text{(NR)} \quad 9,42 \cdot 6 \\
 \hline
 5652 \quad 17
 \end{array}$$

$$\begin{array}{r}
 \text{(NR)} \quad 7,0650 \cdot 2 \\
 \hline
 141300 \\
 \text{(NR)} \quad 14,13 \\
 \hline
 56,52 \\
 \hline
 7065
 \end{array}$$

(Nr. 3)

$$\begin{aligned}V_{\text{Quader}} &= a \cdot b \cdot c \\&= 3 \text{ dm} \cdot 1,5 \text{ dm} \cdot 1,5 \text{ dm} \\&= 3 \text{ dm} \cdot 2,25 \text{ dm}^2 \\&= \underline{6,75 \text{ dm}^3} \quad (6750 \text{ cm}^3)\end{aligned}$$

$$O_{\text{Quader}} = 2 \cdot A_G + M$$

$$A_G = a \cdot b = 3 \text{ dm} \cdot 1,5 \text{ dm} = \underline{4,5 \text{ dm}^2}$$

$$M = a \cdot c = 3 \text{ dm} \cdot 1,5 \text{ dm} = \underline{4,5 \text{ dm}^2}$$

$$O_{\text{Quader}} = 2 \cdot A_G + M$$

$$= 2 \cdot 4,5 \text{ dm}^2 + 4,5 \text{ dm}^2$$

$$= 9 \text{ dm}^2 + 4,5 \text{ dm}^2$$

$$= \underline{13,5 \text{ dm}^2}$$

Nr. 4

$$V_{\text{Dreiecksäule}} = A_G \cdot h$$

$$A_G = \frac{c \cdot h_c}{2} = \frac{3 \text{ cm} \cdot 2 \text{ cm}}{2} = \frac{6 \text{ cm}^2}{2} = \underline{3 \text{ cm}^2}$$

$$V_D = A_G \cdot h = 3 \text{ cm}^2 \cdot 70 \text{ cm} = \underline{210 \text{ cm}^3}$$

$$O_{\text{Dreiecksäule}} = 2 \cdot A_G + M$$

$$A_G = \underline{3 \text{ cm}^2}$$

$$M = a \cdot b = 8 \text{ cm} \cdot 10 \text{ cm} = \underline{80 \text{ cm}^2}$$

$$O_D = 2 \cdot A_G + M$$

$$= 2 \cdot 3 \text{ cm}^2 + 80 \text{ cm}^2$$

$$= 6 \text{ cm}^2 + 80 \text{ cm}^2$$

$$= \underline{\underline{86 \text{ cm}^2}}$$

Nr. 5

$$\begin{aligned}V_{\text{würfel}} &= a \cdot b \cdot c \\ &= 2 \text{ dm} \cdot 2 \text{ dm} \cdot 2 \text{ dm} \\ &= \underline{8 \text{ dm}^3}\end{aligned}$$

$$O_{\text{würfel}} = 6 \cdot A_G = 6 \cdot 4 \text{ dm}^2 = \underline{24 \text{ dm}^2}$$

Nr. 6

$$V_{\text{Kreiszylinder}} = A_G \cdot h$$

$$\begin{aligned}A_G &= \pi \cdot r^2 \\ &= \pi \cdot r \cdot r \\ &= 3,14 \cdot 1 \text{ cm} \cdot 1 \text{ cm} \\ &= \underline{3,14 \text{ cm}^2}\end{aligned}$$

$$\begin{aligned}V_K &= A_G \cdot h \\ &= 3,14 \text{ cm}^2 \cdot 6 \text{ cm} \\ &= \underline{18,84 \text{ cm}^3}\end{aligned}$$

$$\text{(NR)} \quad \begin{array}{r} 3,14 \cdot 6 \\ \hline 18,84 \end{array}$$

$$O_{\text{Kreiszylinder}} = 2 \cdot A_G + M$$

$$A_G = 3,14 \text{ cm}^2$$

$$\begin{aligned}M &= a \cdot b \\ &= 6,28 \text{ cm} \cdot 6 \text{ cm} \\ &= \underline{37,68 \text{ cm}^2}\end{aligned}$$

$$\begin{aligned}OK &= 2 \cdot A_G + M \\ &= 2 \cdot 3,14 \text{ cm}^2 + 37,68 \text{ cm}^2 \\ &= \underline{42,96 \text{ cm}^2}\end{aligned}$$

$$\begin{aligned}a = u &= d \cdot \pi \\ &= 2 \text{ cm} \cdot 3,14 \\ &= 6,28 \text{ cm}\end{aligned}$$

$$\text{(NR)} \quad \begin{array}{r} 6,28 \cdot 6 \\ \hline 37,68 \end{array} \quad \#1$$

(Nr. 7)

$$V_{\text{Kreiszylinder}} = A_G \cdot h$$

$$\begin{aligned} A_G &= \pi \cdot r \cdot r \\ &= 3,14 \cdot 2\text{cm} \cdot 2\text{cm} \\ &= 3,14 \cdot 4\text{cm}^2 \\ &= \underline{12,56\text{cm}^2} \end{aligned}$$

$$\begin{aligned} V_K &= A_G \cdot h \\ &= 12,56\text{cm}^2 \cdot 4\text{cm} \\ &= \underline{50,24\text{cm}^3} \end{aligned}$$

$$\text{(NR)} \quad \frac{12,56 \cdot 4}{50,24}$$

$$O_{\text{Kreiszylinder}} = 2 \cdot A_G + M$$

$$A_G = 12,56\text{cm}^2$$

$$\begin{aligned} M &= a \cdot b \\ &= 12,56\text{cm} \cdot 4\text{cm} \\ &= 50,24\text{cm}^2 \end{aligned}$$

$$\begin{aligned} a = u &= d \cdot \pi \\ &= 4\text{cm} \cdot 3,14 \\ &= 12,56\text{cm} \end{aligned}$$

$$\begin{aligned} O_K &= 2 \cdot A_G + M \\ &= 2 \cdot 12,56\text{cm}^2 + 50,24\text{cm}^2 \\ &= 25,12\text{cm}^2 + 50,24\text{cm}^2 \\ &= \underline{75,36\text{cm}^2} \end{aligned}$$

$$\text{(NR)} \quad \frac{12,56 \cdot 4}{50,24}$$

$$\frac{12,56 \cdot 2}{25,12}$$

$$\begin{array}{r} 50,24 \\ 25,12 \\ \hline 75,36 \end{array}$$

(Nr. 8)

$$V_{\text{Trapezsaule}} = A_G \cdot h$$

$$A_G = \frac{a+c}{2} \cdot h$$

$$= \frac{4\text{m} + 1\text{m}}{2} \cdot 3\text{m}$$

$$= 2,5\text{m} \cdot 3\text{m}$$

$$= \underline{7,5\text{m}^2}$$

$$V_T = A_G \cdot h$$

$$= 7,5\text{m}^2 \cdot 5\text{m}$$

$$= \underline{37,5\text{m}^3}$$

$$\text{(NR)} \frac{7,5 \cdot 5}{37,5}$$

$$O_{\text{Trapezsaule}} = 2 \cdot A_G + M$$

$$A_G = \underline{7,5\text{m}^2}$$

$$M = a \cdot b = 11,8\text{m} \cdot 5\text{m}$$

$$= 59\text{m}^2$$

(NR)

$$a = 4 + 1 + 6,8$$

$$= 11,8$$

$$\frac{11,8 \cdot 5}{59,0}$$

$$59,0 \quad \#$$

$$O_T = 2 \cdot A_G + M$$

$$= 15\text{m}^2 + 59\text{m}^2$$

$$= \underline{74\text{m}^2}$$

Nr 9

$$V_{\text{Trapezoidal}} = A_G \cdot h$$

$$\begin{aligned} A_G &= \frac{a+c}{2} \cdot h \\ &= \frac{5\text{m}+2\text{m}}{2} \cdot 4\text{m} \\ &= 3,5\text{m} \cdot 4\text{m} \\ &= \underline{14\text{m}^2} \end{aligned}$$

$$\begin{aligned} V_T &= A_G \cdot h \\ &= 14\text{m}^2 \cdot 2\text{m} \\ &= \underline{28\text{m}^3} \end{aligned}$$

$$O_{\text{Trapezoidal}} = 2 \cdot A_G + M$$

$$A_G = \underline{14\text{m}^2}$$

$$\begin{aligned} M &= a \cdot b \\ &= 16\text{m} \cdot 2\text{m} \\ &= \underline{32\text{m}^2} \end{aligned}$$

$$\begin{aligned} a &= 5 + 4 + 2 + 5 \\ &= 16 \end{aligned}$$

$$\begin{aligned} O_T &= 2 \cdot A_G + M \\ &= 2 \cdot 14\text{m}^2 + 32\text{m}^2 \\ &= 28\text{m}^2 + 32\text{m}^2 \\ &= \underline{60\text{m}^2} \end{aligned}$$

N. 10

$$\begin{aligned}V_{\text{Quadr}} &= a \cdot b \cdot c \\&= 2,5 \text{ cm} \cdot 2 \text{ cm} \cdot 8 \text{ cm} \\&= \underline{40 \text{ cm}^3}\end{aligned}$$

$$O_{\text{Quadr}} = 2 \cdot A_G + M$$

$$A_G = a \cdot b = 2,5 \text{ cm} \cdot 8 \text{ cm} = \underline{20 \text{ cm}^2}$$

$$\begin{aligned}M &= a \cdot b \\&= 2,5 \text{ cm} \cdot 2 \text{ cm} \\&= \underline{42 \text{ cm}^2}\end{aligned}$$

$$\begin{aligned}O_Q &= 2 \cdot A_G + M \\&= 2 \cdot 20 \text{ cm}^2 + 42 \text{ cm}^2 \\&= \underline{82 \text{ cm}^2}\end{aligned}$$

Nr. 11

$$V_{\text{Dreieckswaule}} = A_G \cdot h$$

$$A_G = \frac{c \cdot h_c}{2} = \frac{4 \text{ cm} \cdot 3 \text{ cm}}{2} = \underline{\underline{6 \text{ cm}^2}}$$

$$\begin{aligned} V_D &= A_G \cdot h \\ &= 6 \text{ cm}^2 \cdot 6 \text{ cm} \\ &= \underline{\underline{36 \text{ cm}^3}} \end{aligned}$$

$$O_{\text{Dreieckswaule}} = 2 \cdot A_G + M$$

$$A_G = \underline{\underline{6 \text{ cm}^2}}$$

$$\begin{aligned} M &= a \cdot b \\ &= 12 \text{ cm} \cdot 6 \text{ cm} \\ &= \underline{\underline{72 \text{ cm}^2}} \end{aligned}$$

$$\begin{aligned} O_D &= 2 \cdot A_G + M \\ &= 2 \cdot 6 \text{ cm}^2 + 72 \text{ cm}^2 \\ &= \underline{\underline{84 \text{ cm}^2}} \end{aligned}$$

Nr. 12

$$V_{\text{Trapezsaule}} = A_G \cdot h$$

$$\begin{aligned} A_G &= \frac{a+c}{2} \cdot h \\ &= \frac{8\text{m}+2\text{m}}{2} \cdot 4\text{m} \\ &= \underline{20\text{m}^2} \end{aligned}$$

$$\begin{aligned} V_T &= A_G \cdot h \\ &= 20\text{m}^2 \cdot 1\text{m} \\ &= \underline{20\text{m}^3} \end{aligned}$$

$$O_{\text{Trapezsaule}} = 2 \cdot A_G + M$$

$$A_G = 20\text{m}^2$$

$$M = a \cdot b$$

$$= 20\text{m} \cdot 1\text{m}$$

$$= \underline{20\text{m}^2}$$

$$\begin{aligned} O_T &= 2 \cdot A_G + M \\ &= 2 \cdot 20\text{m}^2 + 20\text{m}^2 \\ &= \underline{60\text{m}^2} \end{aligned}$$