

1. geg.: $d = 1,90\text{m}$ $r = 0,95\text{m}$ ges.: A_M

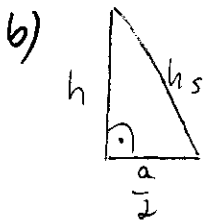
$$h = 3,10\text{m} - 0,6\text{m} = 2,50\text{m}$$

$$A_M = 2\pi r h$$

$$\underline{A_M = 14,92\text{m}^2}$$

2. geg.: $a = 3\text{cm}$ ges.: A_M, A_0, V

$$h_s = 4\text{cm}$$



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

$$A_M = 2 \cdot a \cdot h_s$$

$$h^2 = h_s^2 - \left(\frac{a}{2}\right)^2$$

$$\underline{A_M = 24\text{cm}^2}$$

$$\underline{h = 3,7\text{cm}}$$

$$A_0 = A_a + A_M$$

$$V = \frac{1}{3} a^2 \cdot h$$

$$\underline{A_0 = 33\text{cm}^2}$$

$$\underline{V = 11,1\text{cm}^3}$$

3. geg.: $d = h = 82\text{mm} = 8,2\text{cm}$

$$\rho = 7,8 \frac{\text{g}}{\text{cm}^3}$$

a) $V_Z = \pi r^2 \cdot h$

$$V_K = \frac{4}{3} \pi r^3$$

$$V_Z = 433\text{cm}^3$$

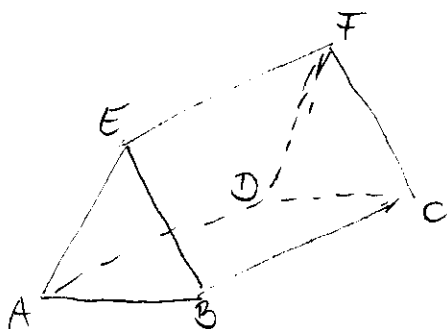
$$V_K = 288,7\text{cm}^3$$

$$\rightarrow \text{Abfall } 144,3\text{cm}^3 \quad \rho = \frac{m}{V} \quad \text{z} \quad m = \rho \cdot V$$

$$\underline{m = 1125,6\text{g}}$$

b) $\frac{144,3\text{cm}^3}{433\text{cm}^3} = 0,333 \quad \text{z} \quad \underline{33,3\%}$

4. a)



b) geg.: $a = 5 \text{ cm}$

$b = 6 \text{ cm}$

$c = 3 \text{ cm} = h$

$d = 2 \text{ cm} \rightarrow r = 1 \text{ cm}$

$\rho = 7,8 \frac{\text{g}}{\text{cm}^3}$

$V_Q = a \cdot b \cdot c$

$V_Q = 90 \text{ cm}^3$

$V_Z = \pi r^2 h$

$V_Z = 9,4 \text{ cm}^3$

$\rightarrow V_K = 80,6 \text{ cm}^3$

$m = \rho \cdot V = \underline{\underline{628,5 \text{ g}}}$

5. geg.: $d_{\text{Kun}} = 120 \text{ mm} = 12 \text{ cm} = d_K = d_Z$ ges.: A_0

$h_Z = 5 \text{ cm}$

$\rightarrow r = 6 \text{ cm}$

V

$h_{\text{Ke}} = 16 \text{ cm}$

m

$\rho = 8,8 \frac{\text{g}}{\text{cm}^3}$

b) $A_{\text{HKun}} = 2\pi r^2 = 226,2 \text{ cm}^2$

$A_{\text{KZ}} = 2\pi r h = 188,5 \text{ cm}^2$

$A_{\text{KKe}} = \pi r s = 322,1 \text{ cm}^2$

$\rightarrow \underline{\underline{A_0 = 736,8 \text{ cm}^2}}$

$s^2 = r^2 + h^2$
 $s = 17,1 \text{ cm}$

c) $V_{\text{HKun}} = \frac{2}{3}\pi r^3 = 452,4 \text{ cm}^3$

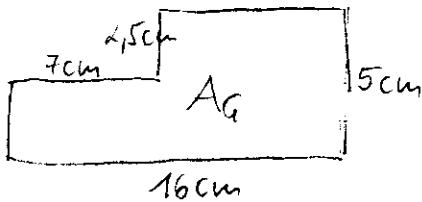
$V_Z = \pi r^2 h = 94,2 \text{ cm}^3$

$V_{\text{Ke}} = \frac{1}{3}\pi r^2 h = 603,2 \text{ cm}^3$

$\rightarrow \underline{\underline{V = 1149,8 \text{ cm}^3}}$

d) $m = \rho \cdot V = 9658,2 \text{ g} \approx \underline{\underline{9,7 \text{ kg}}}$

6.



$$V_z = \pi r^2 h$$

$$V_z = 62,5 \text{ cm}^3 \cdot 2$$

$$= \underline{125,7 \text{ cm}^3}$$

$$A_G = (16 \text{ cm} \cdot 5 \text{ cm}) - (7 \text{ cm} \cdot 2,5 \text{ cm})$$

$$A_G = 62,5 \text{ cm}^2$$

$$V_P = A_G \cdot h$$

$$\underline{V_P = 1562,5 \text{ cm}^3}$$

$$\underline{V_{\text{ges}} = 1436,9 \text{ cm}^3}$$

$$m = \rho \cdot V = 11380 \text{ g} = \underline{\underline{11,38 \text{ kg}}}$$

7. geg.: $d_a = 16 \text{ m}$ & $r_a = 8 \text{ m}$ ges.: A_0

$$\underline{d_i = 15,96 \text{ m}} \quad \& \quad r_i = 7,98 \text{ m} \quad V$$

$$a) \quad A_0 = 4\pi r^2$$

$$\underline{A_0 = 804,2 \text{ m}^2}$$

$$b) \quad V = \frac{4}{3}\pi r^3$$

$$\underline{V = 2128,6 \text{ m}^3}$$

$$c) \quad V_a = \frac{4}{3}\pi r^3 = 2144,7 \text{ m}^3$$

$$\& \quad V_{\text{H\u00fclle}} = 16,1 \text{ m}^3 = 16\,100\,000 \text{ cm}^3$$

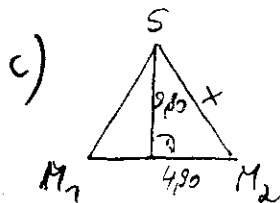
$$\& \quad m = \rho \cdot V = 127\,029\,000 \text{ g}$$

$$\underline{m \approx 127 \text{ t}}$$

8. geg.: $a = 9,80 \text{ m}$

$$h = 4,90 \text{ m}$$

$$b) \quad A = 9,80 \text{ m} \cdot 4,90 \text{ m} = \underline{\underline{48,02 \text{ m}^2}}$$

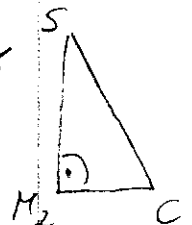


$$x^2 = (9,80 \text{ m})^2 + (4,90 \text{ m})^2$$

$$\underline{x = 10,96 \text{ m}}$$

$$A = \frac{1}{2} \cdot 4,90 \text{ m} \cdot x$$

$$\underline{A = 26,85 \text{ m}^2}$$



→ sind vier solche Dreiecksfl\u00e4chen

$$\rightarrow \underline{\underline{A = 107,4 \text{ m}^2}}$$

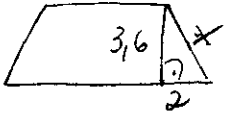
9. $a = 11,6 \text{ cm}$
 $c = 7,6 \text{ cm}$
 $h_a = 3,6 \text{ cm}$
 $h = 10 \text{ cm}$

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

$$A_G = 34,56 \text{ cm}^2 \cdot 2 = \underline{69,12 \text{ cm}^2}$$

$$A_M = u \cdot h$$

$$\underline{A_M = 274 \text{ cm}^2}$$



$$x^2 = (3,6 \text{ cm})^2 + (2 \text{ cm})^2$$

$$x = 4,1 \text{ cm}$$

$$\rightarrow u = 27,4 \text{ cm}$$

$$A_0 = 2A_G + A_M$$

$$A_0 = 343,12 \text{ cm}^2 \cdot 15\% + 51,47 \text{ cm}^2$$

$$\underline{\underline{394,6 \text{ cm}^2}}$$

10. geg.: $a = 4 \text{ cm}$

$$b = \frac{1}{4}a = 1 \text{ cm}$$

$$h = 2a = 8 \text{ cm}$$

b) $A_Q = a^2 = 16 \text{ cm}^2$

$$A_D = \frac{a \cdot b}{2} = 2 \text{ cm}^2$$

$$\left. \begin{array}{l} A_Q = a^2 = 16 \text{ cm}^2 \\ A_D = \frac{a \cdot b}{2} = 2 \text{ cm}^2 \end{array} \right\} A_G = A_Q - 4 \cdot A_D = \underline{8 \text{ cm}^2}$$

$$V = A_G \cdot h = \underline{\underline{63 \text{ cm}^3}}$$

c) $V = A_G \cdot h$ $h = 2a$ $A_G = a^2 - 4A_D$ $A_D = \frac{1}{2}a \cdot b$

$$\hookrightarrow V = A_G \cdot 2a$$

mit $b = \frac{1}{4}a$

folgt $A_D = \frac{1}{8}a^2$

$$\hookrightarrow A_G = a^2 - 4 \cdot \frac{1}{8}a^2$$

$$A_G = a^2 - \frac{1}{2}a^2$$

$$A_G = \frac{1}{2}a^2$$

$$V = \frac{1}{2}a^2 \cdot 2a$$

$$\underline{\underline{V = a^3}}$$

11. a) geg.: $h_k = 0,33 \text{ m}$

$d_k = 1,76 \text{ m} \rightarrow r_k = 0,88 \text{ m}$

$A_{\text{H}} = \pi r^2 s$

$s^2 = h^2 + r^2$

$A_{\text{H}} = 2,6 \text{ m}^2$

$s = 0,94 \text{ m}$

A für 6 Säulen: $15,6 \text{ m}^2$

$15,6 \text{ m}^2 \cdot 9\% = 1,4 \text{ m}^2$

$15,6 \text{ m}^2 + 1,4 \text{ m}^2 = \underline{17 \text{ m}^2}$

Der Gesamtbedarf für 6 Dächer beträgt 17 m^2 .

b) geg.: $d_z = 1,60 \text{ m} \rightarrow r_z = 0,80 \text{ m}$

$h_z = 2,20 \text{ m}$

$A_{\text{H}} = 2\pi r h$

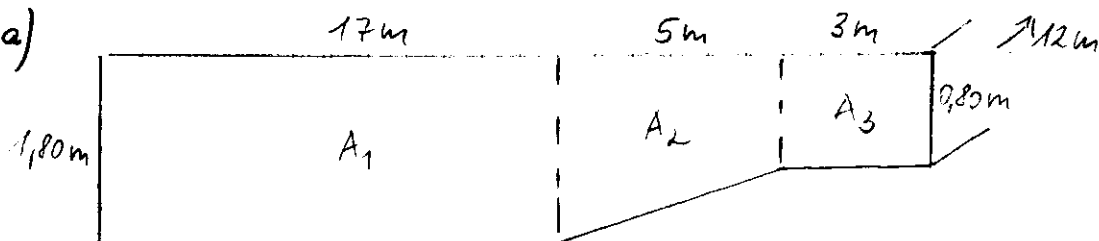
$A_{\text{H}} = 11,06 \text{ m}^2$

$6 \cdot A_{\text{H}} = \underline{66,4 \text{ m}^2}$

$66,4 \text{ m}^2 \cdot 9,50 \text{ €/m}^2 = 630,80 \text{ €}$ je Woche

$\rightarrow \underline{32801,60 \text{ €}}$ im Jahr

12. a)



$A_1 = 17 \text{ m} \cdot 1,80 \text{ m}$ $A_2 = \frac{1,80 + 0,80 \text{ m}}{2} \cdot 5 \text{ m}$ $A_3 = 3 \text{ m} \cdot 0,80 \text{ m}$

$A_1 = 30,6 \text{ m}^2$

$A_2 = 6,5 \text{ m}^2$

$A_3 = 2,4 \text{ m}^2$

$\rightarrow \underline{A_{\text{ges}} = 39,5 \text{ m}^2}$

$V = A_{\text{g}} \cdot h$

$V = 474 \text{ m}^3$

Es sind 474 m^3 Wasser enthalten, wenn das Becken bis zum Rand gefüllt ist.

$$\left. \begin{array}{l} \text{Rohr 1 : } x+17 \\ \text{Rohr 2 : } x \end{array} \right\} 6 \text{ Stunden}$$

$$(x+x+17) \cdot 6 = 474$$

$$12x + 102 = 474$$

$$12x = 372$$

$$\underline{x = 31}$$

$$x + 17 = \underline{48}$$

Aus dem ersten Rohr fließen 48 m^3 und dem zweiten Rohr 31 m^3 Wasser pro Stunde.

$$g) \quad 2 \cdot A_1 = 61,2 \text{ m}^2$$

$$2 \cdot A_2 = 13 \text{ m}^2$$

$$2 \cdot A_3 = 4,8 \text{ m}^2$$

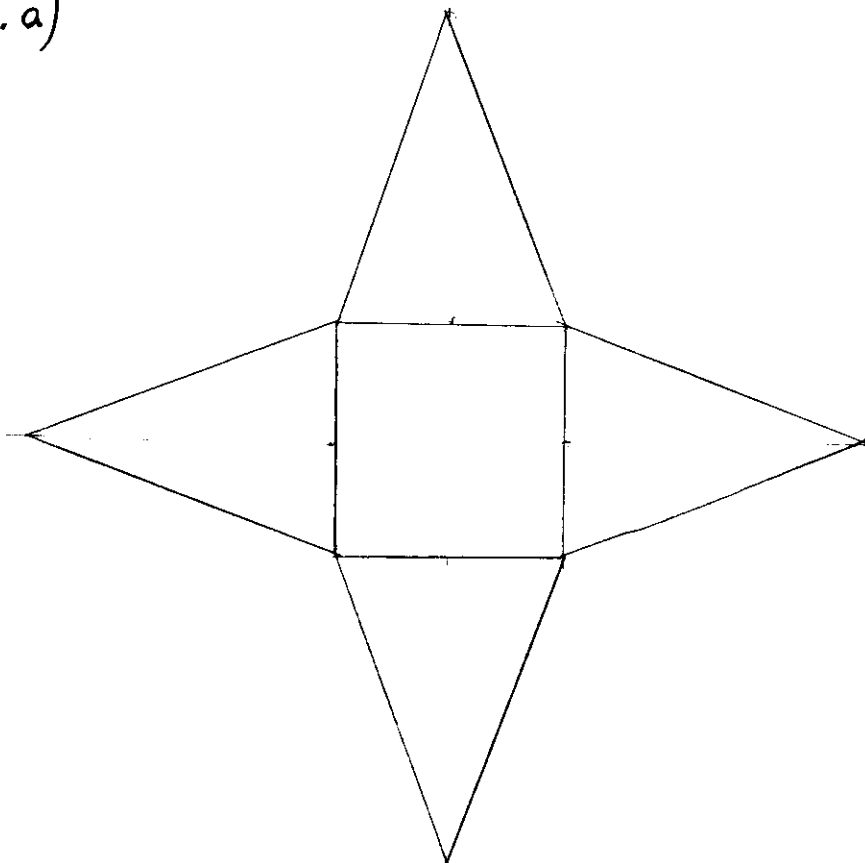
$$A_4 = 1,8 \text{ m} \cdot 12 \text{ m} = 21,6 \text{ m}^2$$

$$A_5 = 0,8 \text{ m} \cdot 12 \text{ m} = 9,6 \text{ m}^2$$

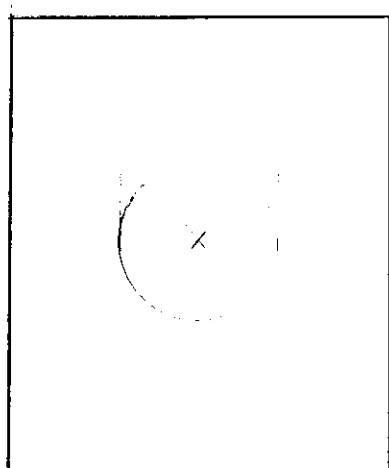
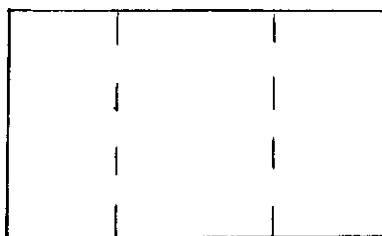
$$\rightarrow \underline{A_{\text{ges}} = 110,2 \text{ m}^2}$$

Die zu fließende Fläche beträgt $110,2 \text{ m}^2$

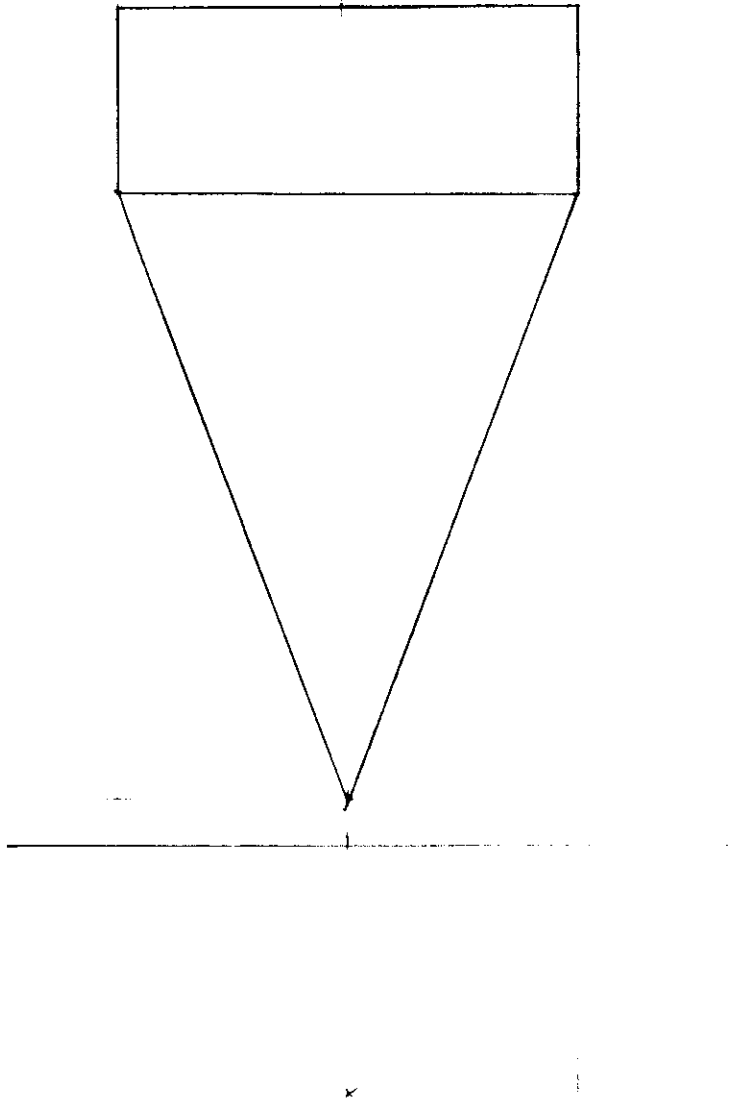
2. a)



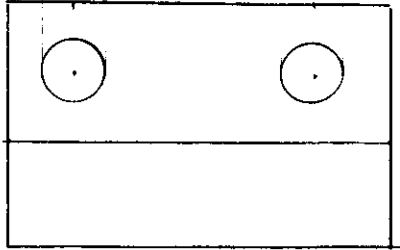
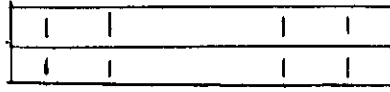
4. b)



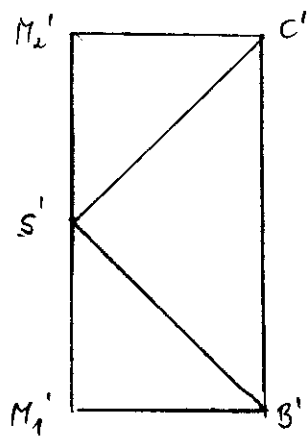
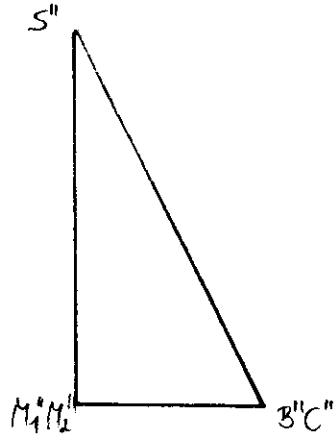
5. Maßstab: 1:2



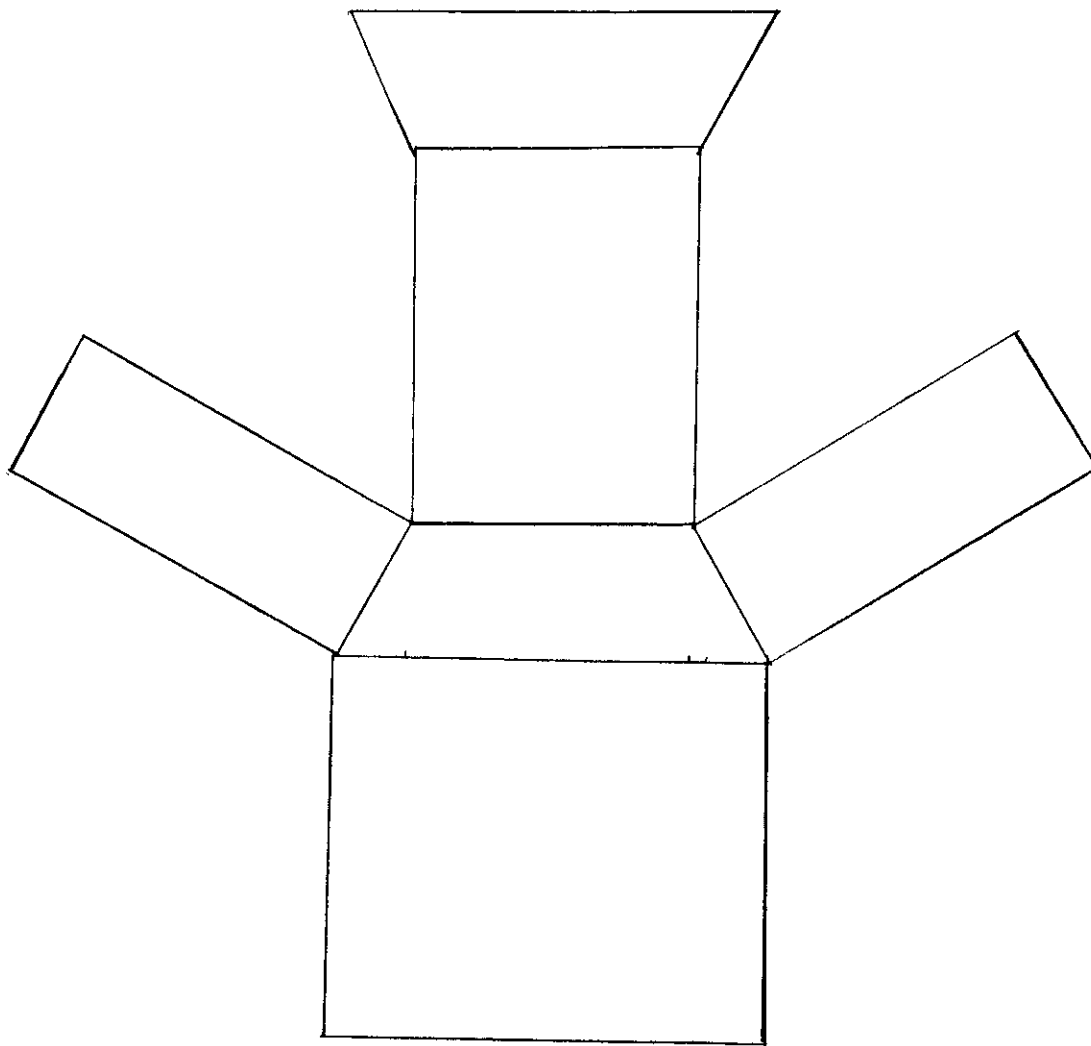
6. a) Maßstab: 1:5



8. a) Maßstab: 1:200



9.a) Maßstab 1:2



10. a)

