Lösungen

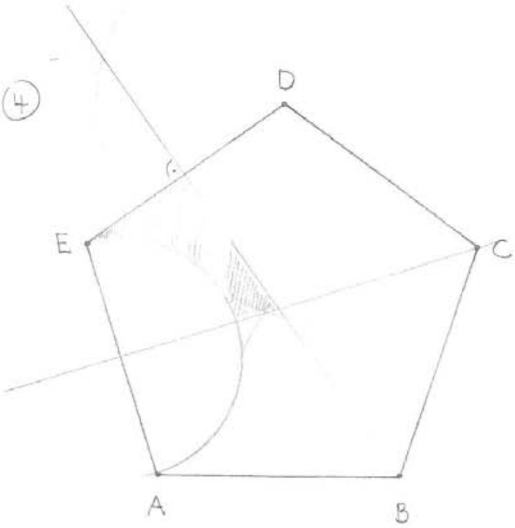
① $\mathbb{L} = \{6, 9, 12\}$

② $\frac{4b^2-2b}{2a} \cdot \frac{a^2}{b^2} = \frac{2b^2-b}{a} \cdot \frac{a^2}{b^2} = \frac{a^2(2b^2-b)}{ab^2} = \frac{a(2b-1)}{b}$

③ ⓐ
$20x - 8(x+2) = 11 - 3x$
$20x - 8x - 16 = 11 - 3x$
$12x - 16 = 11 - 3x$
$15x = 27$
$x = \frac{27}{15} = \frac{9}{5} = 1.8$

ⓑ
$\left(x + \frac{1}{4}\right) \cdot 2 = \frac{2}{3} \cdot x$
$2x + \frac{1}{2} = \frac{2x}{3}$
$12x + 3 = 4x$
$8x = -3$
$x = -\frac{3}{8} = -0.375$

④



⑤ ⓐ
$12 = 2 \cdot 2 \cdot 3$
$15 = 3 \cdot 5$
$18 = 2 \cdot 3 \cdot 3$

$kgV = 2 \cdot 2 \cdot 3 \cdot 3 \cdot 5 = 180$

$\longrightarrow 185$

ⓑ 185, 365, 545, 725, 905

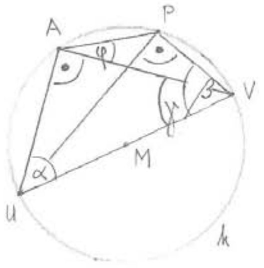
⑥ $x \mathrel{\hat{=}}$ Annas Betrag zu Beginn

$x + 5 = 2\left(\frac{x}{6} + 5\right)$
$x + 5 = \frac{x}{3} + 10$
$3x + 15 = x + 30$
$2x = 15$
$x = \frac{15}{2} = 7.5$ [Fr.]

⑦ $x \mathrel{\hat{=}}$ Etagenhöhe $\left(\Delta t = \frac{\Delta s}{v}\right)$

$\frac{5x}{1} + 10 + \frac{4x}{1.2} = 32$
$6x + 12 + 4x = 38.4$
$10x = 26.4$
$x \approx 2.64$ [m]

(8)



Idee: $\sphericalangle VAU = 90°$ (Thales)

$\sphericalangle VPU = 90°$ (Thales)

$\gamma = 90° - \alpha = 32°$

$\beta = 90° - \alpha/2 = 61°$

$\varphi = \beta - \gamma = \underline{\underline{29°}}$ (ΔAVP gleichschenklig)

(9) ΔDMF rechtwinklig:

$\overline{MD} = \sqrt{4^2 - 2^2} = \sqrt{12} = 2\sqrt{3} \approx 3.464$

ΔADM rechtwinklig:

$\overline{AM} = \sqrt{8^2 + (2\sqrt{3})^2} = \underline{\underline{\sqrt{76}}} = 2\sqrt{19}$

$\approx \underline{\underline{8.718}}$

(10) $V_{Wasser} = G \cdot h$

$= \left(20 \cdot 10 + \frac{10 \cdot 10}{2}\right) \cdot 40 = 250 \cdot 40$

$= 10'000\ [cm^3]$

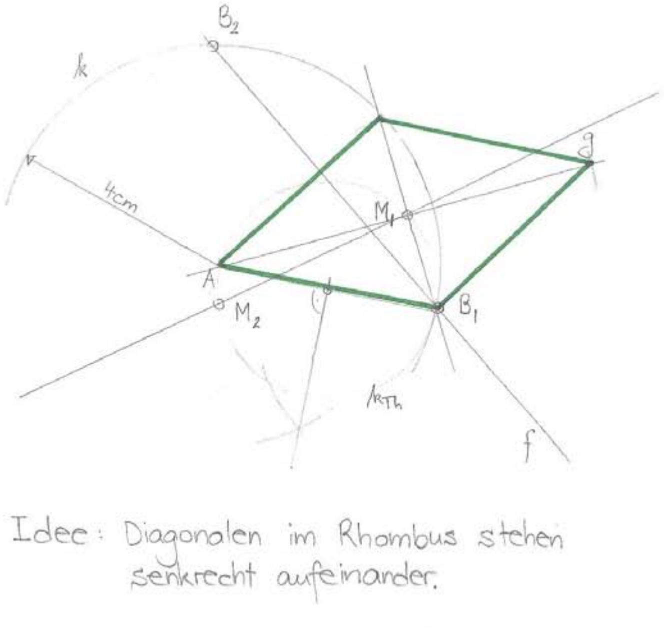
$G_{Lage\ B} = 40 \cdot 40 - \frac{20 \cdot 20}{2} = 1'400\ [cm^2]$

$x = \frac{V_{Wasser}}{G_{Lage\ B}} = \frac{10'000}{1'400} = \underline{\underline{\frac{50}{7}}} \approx \underline{\underline{7.143}}\ [cm]$

(11) (a) $N(4) = 4^3 + 3 \cdot 4 = \underline{\underline{76}}$

(b) $N(x) = \underline{\underline{x^3 + 3x}}$

(12)



Idee: Diagonalen im Rhombus stehen senkrecht aufeinander.

- $k(A, 4cm) \cap f = B_{1,2}$
- Thaleskreis k_{Th} über AB_1 (Thaleskreis über AB_2 ergibt mit g keinen Schnittpunkt.)
- $k_{Th} \cap g = M_{1,2}$ (M_2 gibt eine im Uhrzeigersinn beschriftete Lösung.)
- z.B. Rhombus mit Hilfe der senkrecht stehenden Diagonalen ergänzen...