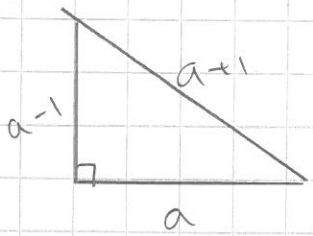
4. Tarogeometria

4.5



Pythagoras: $a^2 + (a-1)^2 = (a+1)^2$

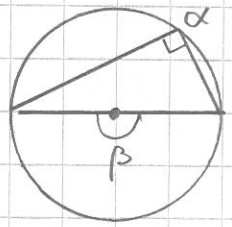
$\Leftrightarrow a^2 + a^2 - 2a + 1 = a^2 + 2a + 1$

$\Leftrightarrow a^2 - 4a = 0$

$\Leftrightarrow a(a-4) = 0$

$\Leftrightarrow a = 0$ tai $a = 4$

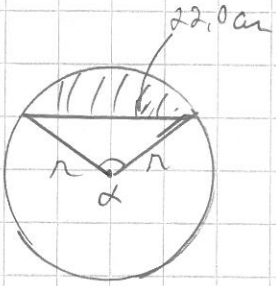
↓ ✓



Kehäkulmalause: $\alpha = \frac{\beta}{2} = \frac{180°}{2} = 90°$

Sade: $r = \frac{a+1}{2} = \frac{4+1}{2} = \underline{\frac{5}{2}}$

4.6



$r = 13{,}0\,\text{cm}$

Kosinilause:

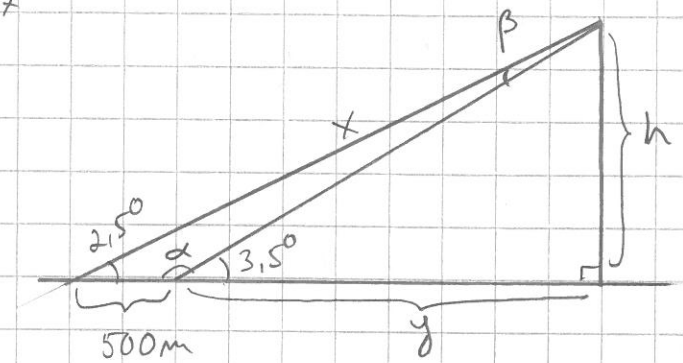
$22^2 = 13^2 + 13^2 - 2 \cdot 13 \cdot 13 \cdot \cos\alpha$

$\Leftrightarrow 22^2 - 13^2 - 13^2 = -2 \cdot 13 \cdot 13 \cos\alpha \quad | : (-2 \cdot 13 \cdot 13)$

$\Leftrightarrow \cos\alpha = \frac{22^2 - 13^2 - 13^2}{-2 \cdot 13^2} \Rightarrow \alpha \approx 115{,}591°$

$A_{\text{seg}} = A_K - A_\triangle = \frac{\alpha}{360°} \cdot \pi r^2 - \frac{1}{2} r \cdot r \cdot \sin\alpha \approx \ldots \approx \underline{94{,}3\,\text{cm}^2}$

4.7



$\alpha = 180° - 3{,}5° = 176{,}5°$

$\beta = 180° - 2{,}5° - 176{,}5° = 1°$

Sinilause:

$\frac{x}{\sin\alpha} = \frac{500\,\text{m}}{\sin\beta} \quad | \cdot \sin\alpha$

$\Leftrightarrow x = \frac{500\,\text{m} \cdot \sin 176{,}5°}{\sin 1°} \approx 1749{,}0006\,\text{m}$

$\sin 2{,}5° = \frac{h}{x} \quad | \cdot x \quad \Leftrightarrow h = 1749{,}0006\,\text{m} \cdot \sin 2{,}5° \approx 76{,}290\,\text{m} \approx \underline{76\,\text{m}}$

$\tan 3{,}5° = \frac{h}{y} \quad | \cdot \frac{y}{\tan 3{,}5°} \quad \Leftrightarrow y = \frac{h}{\tan 3{,}5°} = \ldots \approx 1247{,}3\,\text{m} \approx \underline{1250\,\text{m}}$

Je $500\,\text{m} + y \approx \underline{1750\,\text{m}}$