1) Geg.: quad. Pyramide: G = 64 cm²; V = 256 cm³
ρ = 7,86 g/cm³ (Eisen)

Ges.: M, h_k, h_s, O, m

Formeln:

$G = a^2$

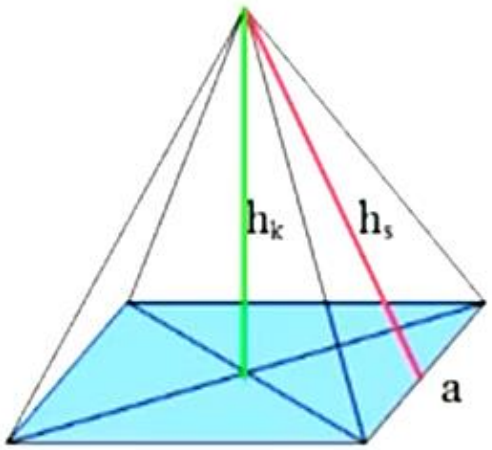
$u = 4 * a$

$V = \frac{G * h_k}{3}$

$M = 2*a * h_s$

$O = G + M$

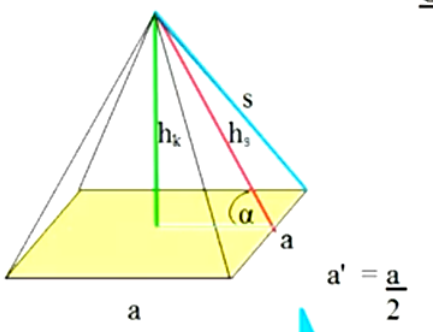
$m = \rho * V$



2) Geg.: quad. Pyramide: s = 8,4 cm; h_s = 7,2 cm

Ges.: h_k, G, M, O, V, α

(Winkelberechnung nur V-LmMatura)



$a' = \frac{a}{2}$

Formeln:

$G = a^2$

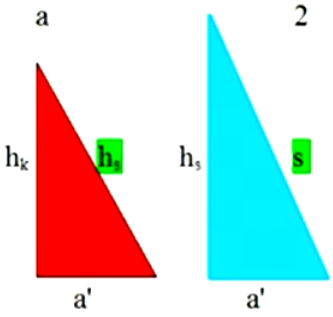
$u = 4 * a$

$V = \frac{G * h_k}{3}$

$M = 2*a* h_s$

$O = G + M$

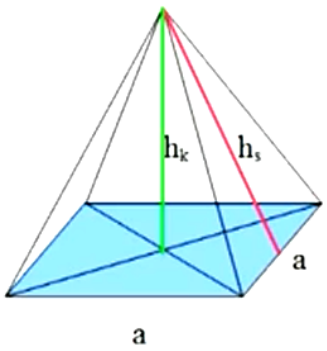
$m = \rho * V$



Viel Erfolg!

Lösung zu 1:

Quadratische Pyramide



Formeln:

$G = a^2$

$u = 4 * a$

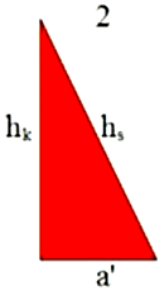
$V = \frac{G * h_k}{3}$

$M = 2*a * h_s$

$O = G + M$

$m = \rho * V$

$a' = \frac{a}{2} = 4$ cm



① Geg.: quad. Pyramide: $G = 64$ cm²; $V = 256$ cm³

$\rho = 7{,}86$ g/cm³ (Eisen)

Ges.: M, h_k, h_s, O, m

$a^2 = G \quad | \sqrt{}$

$a = \sqrt{G} = \sqrt{64} = 8$ cm

$\frac{G * h_k}{3} = V \quad | *3 \; | : G$

$h_k = \frac{3 * V}{G} = \frac{3 * 256}{64} = 12$ cm

$h_s^2 = h_k^2 + (a')^2 \quad | \sqrt{}$

$h_s = \sqrt{h_k^2 + a'^2} = \sqrt{12^2 + 4^2} = 12{,}65$ cm

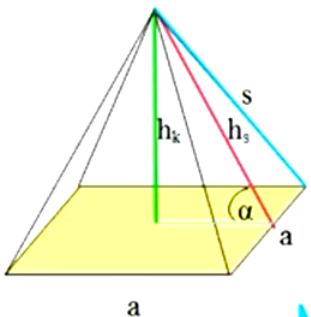
$M = 2 * a * h_s = 2 * 8 * 12{,}65 = 202{,}4$ cm²

$O = G + M = 64 + 202{,}4 = 266{,}4$ cm²

$m = \rho * V = 7{,}86$ g/cm³ $* 256$ cm³ $= 2012{,}16$ g

Lösung zu 2:

Quadratische Pyramide



$a' = \frac{a}{2}$

Formeln:

$G = a^2$

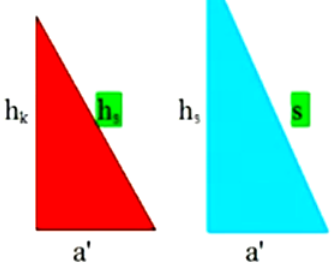
$u = 4 * a$

$V = \frac{G * h_k}{3}$

$M = 2*a* h_s$

$O = G + M$

$m = \rho * V$



③ Geg.: quad. Pyramide: $s = 8{,}4$ cm; $h_s = 7{,}2$ cm

Ges.: h_k, G, M, O, V, α

$hs^2 + a'^2 = s^2 \quad | -h_s^2 \quad | \sqrt{}$

$a' = \sqrt{s^2 - h_s^2} = \sqrt{8{,}4^2 - 7{,}2^2} = 4{,}33$ cm

$a = 2*a' = 2 * 4{,}33 = 8{,}66$ cm

$h_k^2 + a'^2 = h_s^2 \quad | - a'^2 \quad | \sqrt{}$

$h_k = \sqrt{h_s^2 - a'^2} = \sqrt{7{,}2^2 - 4{,}33^2} = 5{,}75$ cm

$G = a^2 = 8{,}66^2 = 75$ cm²

$M = 2*a*h_s = 2*8{,}66*7{,}2 = 124{,}7$ cm²

$O = G + M = 75 + 124{,}7 = 199{,}7$ cm²

$V = \frac{G * h_k}{3} = \frac{75 * 5{,}75}{3} = 143{,}75$ cm³

$\sin \alpha = \frac{h_k}{h_s} \quad | \sin^{-1} \quad \alpha = \sin^{-1} \left[\frac{5{,}75}{7{,}2}\right] = 53°$

Viel Erfolg!