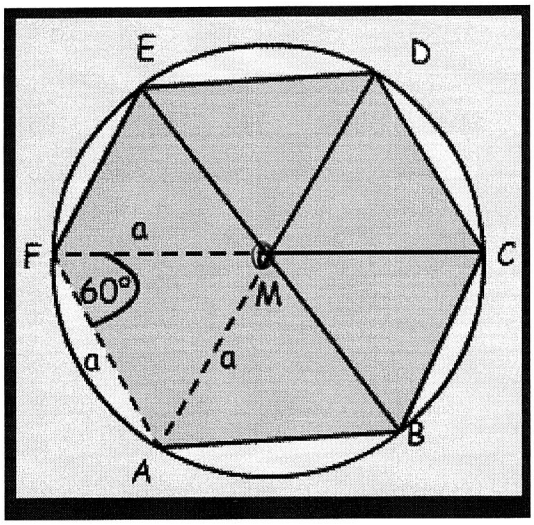
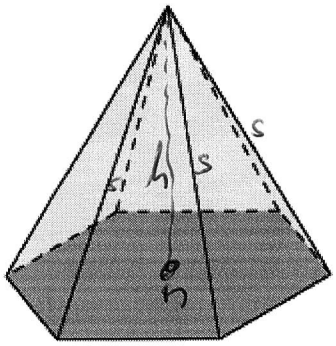
243



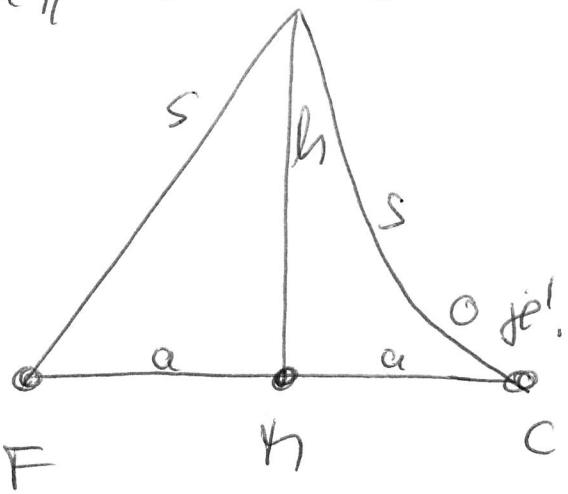


$a = 4$ cm

$s = 10$ cm

Berechnung der Pyramidenhöhe

Bei 3-D-Figuren [„Pyramide"] empfiehlt sich oft eine „Schnittzeichnung":



Man sieht

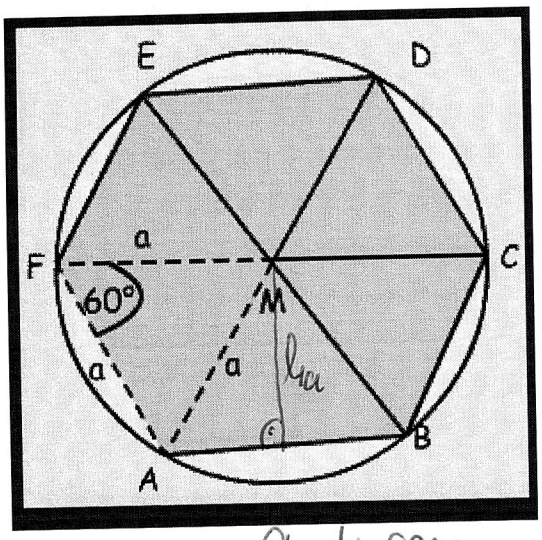
$$h^2 + a^2 = s^2$$

$$h^2 = s^2 - a^2$$

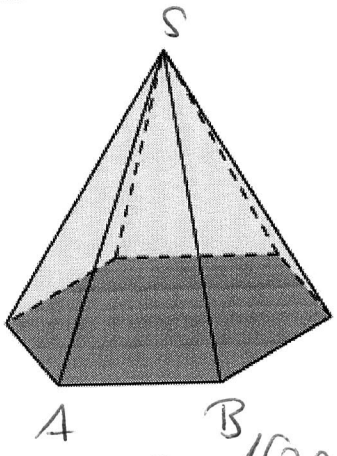
$$= 100 - 16$$

$$= 84$$

$$h = \sqrt{84} = \sqrt{4 \cdot 21} = 2\sqrt{21}$$ ✓ (1)



$a = 4\,cm$



$s = 10\,cm$

$$O_{Pyramide} = A_{Sechseck} + 6 \cdot A_{Dreieck}^{ABC}$$

1. Schritt $A_{Sechseck} = 6 \cdot A_{Dreieck\,ABM}$

$$= 6 \cdot \frac{1}{2} \cdot a \cdot h_a$$

Nebenrechnung:

$$h_a^2 + \left[\frac{a}{2}\right]^2 = a^2$$

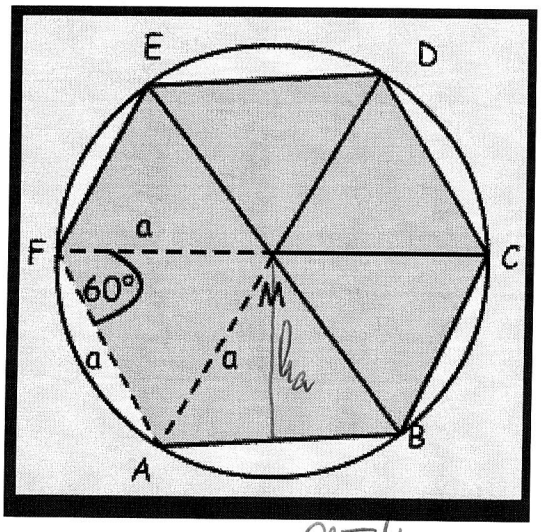
$$h_a^2 = a^2 - \frac{a^2}{4} = \frac{3}{4}a^2 = \frac{a^2}{4} \cdot 3$$

$$h_a = \frac{a}{2}\sqrt{3}$$

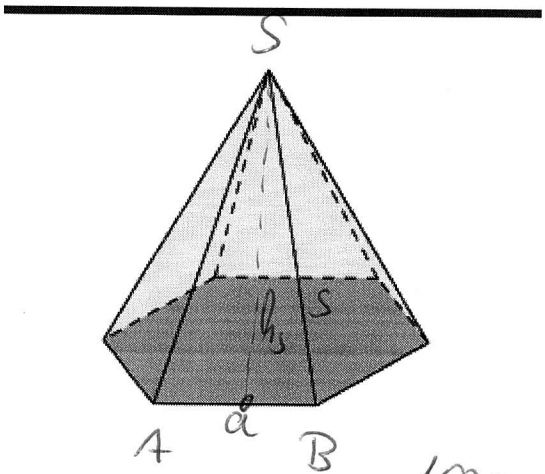
$$= 6 \cdot \frac{1}{2} \cdot a \cdot \frac{a}{2}\sqrt{3}$$

$$= \frac{3}{2}a^2\sqrt{3}$$

$$= 24\sqrt{3}$$ ✓

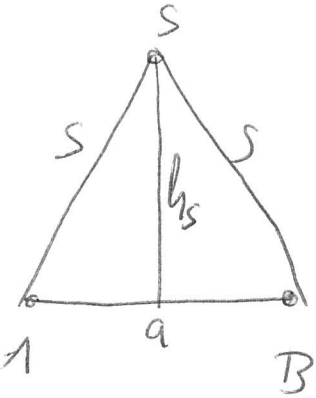


$a = 4\,cm$



$s = 10\,cm$

2. Schritt $A_{\Delta ABS}$



$$A_{\Delta ABC} = \frac{1}{2} \cdot a \cdot h_s$$

NR $\quad h_s^2 + \left[\frac{a}{2}\right]^2 = s^2$

$$h_s^2 = s^2 - \frac{a^2}{4}$$

$$= 100 - 4$$

$$= 96$$

$$h_s = \sqrt{96} = \sqrt{16 \cdot 6} = 4\sqrt{6}$$

$$= \frac{1}{2} \cdot 4 \cdot 4\sqrt{6}$$

$$= 8\sqrt{6}$$

$$O_{Pyr} = A_{Sechseck} + 6 \cdot A_{\Delta ABS}$$

$$= 24\sqrt{3} + 6 \cdot 8\sqrt{6}$$

$$= 24\sqrt{3} + 48\sqrt{6}$$