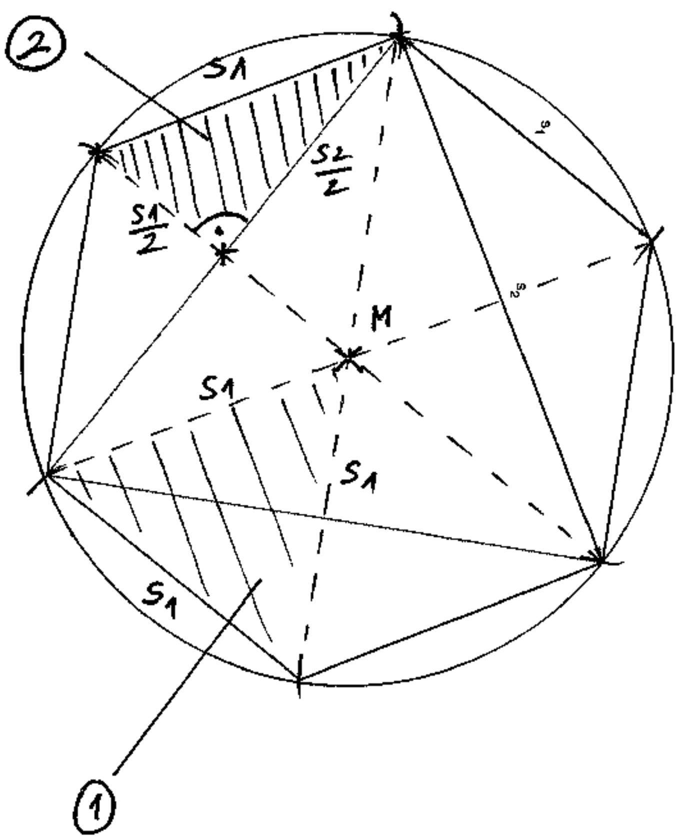
1.



(1) Gleichseitiges Dreieck mit Seitenlänge s_1

(2)
$$s_1^2 = \left(\frac{s_2}{2}\right)^2 + \left(\frac{s_1}{2}\right)^2$$

$$= \frac{s_2^2}{4} + \frac{s_1^2}{4} \qquad \Big| - \frac{s_1^2}{4}$$

$$\frac{3 \cdot s_1^2}{4} = \frac{s_2^2}{4} \qquad \Big| \cdot 4$$

$$3 \cdot s_1^2 = s_2^2 \qquad \Big| \sqrt{}$$

$$\sqrt{3 \cdot s_1^2} = \sqrt{s_2^2}$$

$$\sqrt{3} \cdot \sqrt{s_1^2} = \sqrt{s_2^2}$$

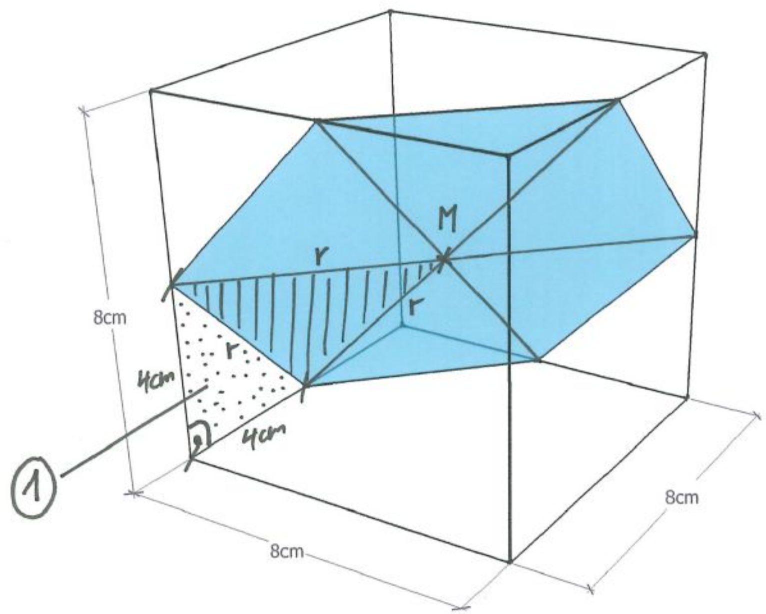
$$\sqrt{3} \cdot s_1 = s_2 \qquad \Big| : s_2$$

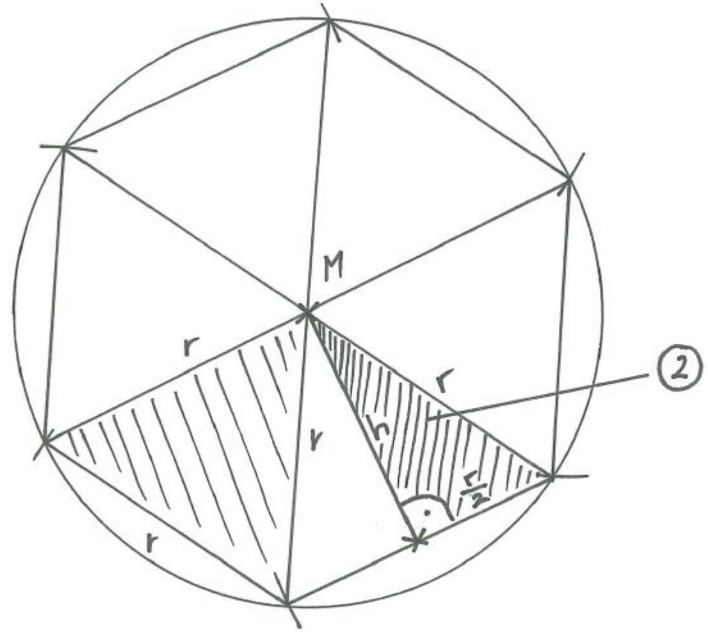
$$\sqrt{3} \cdot \frac{s_1}{s_2} = 1 \qquad \Big| : \sqrt{3}$$

$$\frac{s_1}{s_2} = \frac{1}{\sqrt{3}}$$

oder: $\underline{\underline{s_1 : s_2 = 1 : \sqrt{3}}}$

2.





① $r^2 = (4\,cm)^2 + (4\,cm)^2 \quad |\sqrt{}$

$r = \sqrt{4^2 + 4^2}$

$= \sqrt{16 + 16} = \underline{\sqrt{32}\,cm}$

„Wurzelreduktion" $\left\{ \begin{array}{l} = \sqrt{16 \cdot 2}\,cm \\ = \sqrt{16} \cdot \sqrt{2}\,cm = \underline{4 \cdot \sqrt{2}\,cm} \end{array} \right.$

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

$r^2 = h^2 + \frac{r^2}{4} \quad | -\frac{r^2}{4}$

$\frac{3 \cdot r^2}{4} = h^2 \quad |\sqrt{}$

$h = \sqrt{\frac{3 \cdot r^2}{4}} = \frac{\sqrt{3} \cdot \sqrt{r^2}}{\sqrt{4}} = \frac{\sqrt{3} \cdot r}{2}$

$= \frac{\sqrt{3} \cdot 4 \cdot \sqrt{2}}{2} = \frac{\cancel{4}^{2} \cdot \sqrt{3 \cdot 2}}{\cancel{2}_{1}} = \underline{2 \cdot \sqrt{6}\,cm}$

③ <u>Flächeninhalt Dreieck</u>

$A = \frac{\text{Grundlinie} \cdot \text{Höhe}}{2} = \frac{r \cdot h}{2}$

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

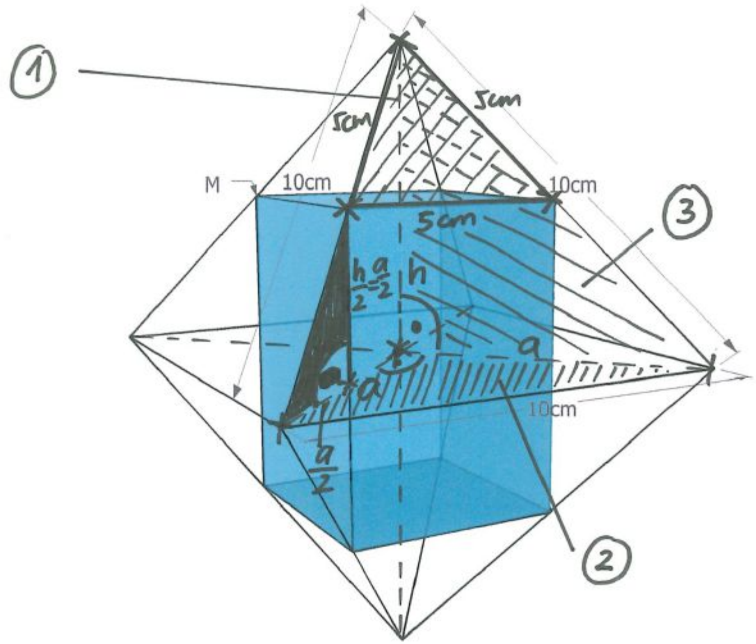
$= 4 \cdot \sqrt{2 \cdot 6} = 4 \cdot \sqrt{12} = 4 \cdot \sqrt{4} \cdot \sqrt{3}$

$= 4 \cdot 2 \cdot \sqrt{3} = \underline{8 \cdot \sqrt{3}\,cm^2}$

④ <u>Flächeninhalt Sechseck</u>

$A = 6 \cdot 8 \cdot \sqrt{3}\,cm^2 = \underline{\underline{48 \cdot \sqrt{3}\,cm^2}}$

3.



(1) Gleichseitiges Dreieck mit Seitenlänge 5cm.

(2) $10^2 = a^2 + a^2 = 2a^2 \quad | :2$

$\frac{10^2}{2} = a^2 \quad | \sqrt{}$

$a = \sqrt{\frac{10^2}{2}} = \sqrt{\frac{100}{2}} = \sqrt{50}$

$= \sqrt{25 \cdot 2} = \sqrt{25} \cdot \sqrt{2}$

$= \underline{5 \cdot \sqrt{2}\,cm}$

Deckfläche und Grundfläche Quader:

$A = (5cm)^2 = \underline{25\,cm^2}$

(3) $10^2 = a^2 + h^2 \quad | -a^2$

$10^2 - a^2 = h^2 \quad | \sqrt{}$

$h = \sqrt{10^2 - a^2}$

$= \sqrt{10^2 - (5 \cdot \sqrt{2})^2} = \sqrt{100 - 50}$

$= \sqrt{50} = \sqrt{25 \cdot 2} = \sqrt{25} \cdot \sqrt{2} = \underline{5 \cdot \sqrt{2}\,cm}$

$\Rightarrow \underline{a = h}$

$\Rightarrow$ Halbe Höhe Quader: $\frac{h}{2} = \frac{a}{2} = \underline{\frac{5 \cdot \sqrt{2}}{2}\,cm}$

$\Rightarrow$ Ganze Höhe Quader: $h = a = \underline{5 \cdot \sqrt{2}\,cm}$

Seitenfläche (Rechteck) Quader:

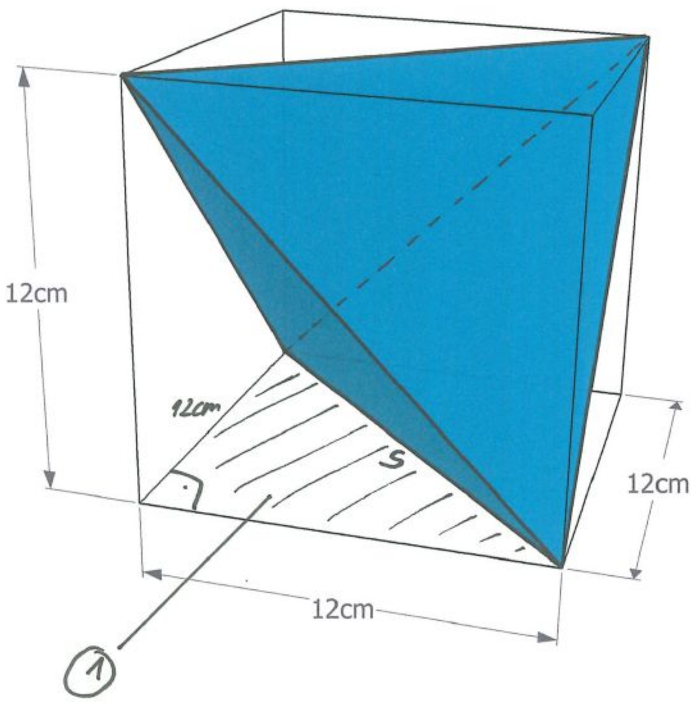
$A = 5cm \cdot h = 5 \cdot 5 \cdot \sqrt{2}\,cm^2 = \underline{25 \cdot \sqrt{2}\,cm^2}$

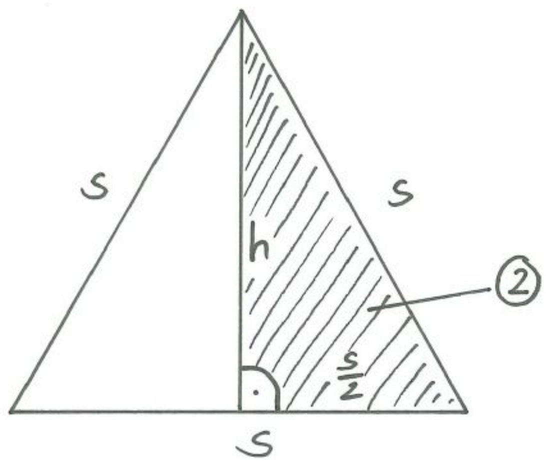
Oberfläche Quader:

$O = 2 \cdot 25\,cm^2 + 4 \cdot 25 \cdot \sqrt{2}\,cm^2$

$= \underline{\underline{(50 + 100 \cdot \sqrt{2})\,cm^2}}$

4.





(1)
$$s^2 = (12cm)^2 + (12cm)^2 \quad | \sqrt{\ }$$
$$s = \sqrt{12^2 + 12^2} = \sqrt{144 + 144}$$
$$= \sqrt{288} = \sqrt{144 \cdot 2} = \sqrt{144} \cdot \sqrt{2} = \underline{12 \cdot \sqrt{2}\, cm}$$

(2)
$$s^2 = h^2 + \left(\frac{s}{2}\right)^2$$
$$= h^2 + \frac{s^2}{4} \quad \left| - \frac{s^2}{4}\right.$$
$$\frac{3 \cdot s^2}{4} = h^2 \quad | \sqrt{\ }$$
$$h = \sqrt{\frac{3 \cdot s^2}{4}} = \frac{\sqrt{3} \cdot \sqrt{s^2}}{\sqrt{4}}$$
$$= \frac{\sqrt{3} \cdot s}{2}$$
$$= \frac{\sqrt{3} \cdot \cancel{12}^{6} \cdot \sqrt{2}}{\cancel{2}_{1}} = 6 \cdot \sqrt{3} \cdot \sqrt{2} = \underline{6 \cdot \sqrt{6}\, cm}$$

(3) Flächeninhalt Dreieck

$$A = \frac{\text{Grundlinie} \cdot \text{Höhe}}{2} = \frac{s \cdot h}{2}$$
$$= \frac{12 \cdot \sqrt{2} \cdot \cancel{6}^{3} \cdot \sqrt{6}}{\cancel{2}} = 36 \cdot \sqrt{12}$$
$$= 36 \cdot \sqrt{4} \cdot \sqrt{3} = 36 \cdot 2 \cdot \sqrt{3} = \underline{72 \cdot \sqrt{3}\, cm^2}$$

(4) Oberfläche Tetraeder

$$O = 4 \cdot 72 \cdot \sqrt{3}\, cm^2 = \underline{\underline{288 \cdot \sqrt{3}\, cm^2}}$$