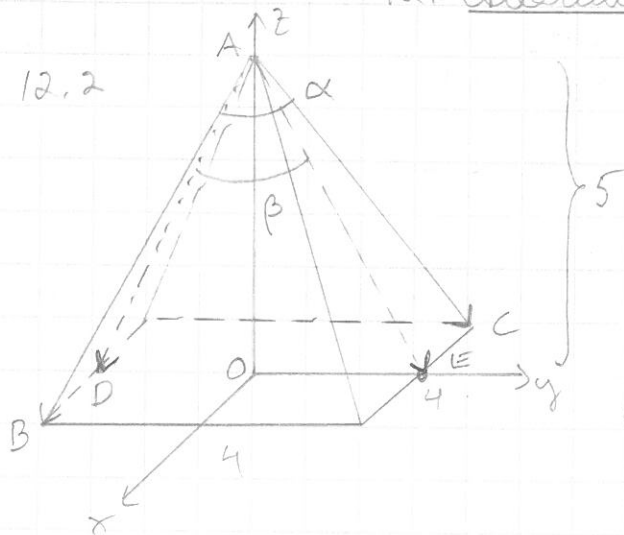


12. Merkmale Pyramide

12.2



$$A = (0, 0, 5), B = (2, -2, 0)$$

$$C = (-2, 2, 0)$$

$$\begin{aligned} \vec{AB} &= 2\vec{i} - 2\vec{j} - 5\vec{k} \\ \vec{AC} &= -2\vec{i} + 2\vec{j} - 5\vec{k} \end{aligned}$$

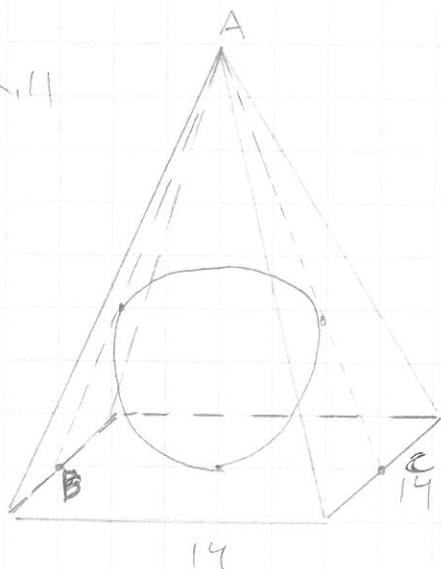
$$\begin{aligned} \cos(\vec{AB}, \vec{AC}) &= \frac{\vec{AB} \cdot \vec{AC}}{|\vec{AB}| |\vec{AC}|} = \frac{2 \cdot (-2) + (-2) \cdot 2 + (-5) \cdot (-5)}{\sqrt{2^2 + (-2)^2 + (-5)^2} \cdot \sqrt{(-2)^2 + 2^2 + (-5)^2}} \\ &= \frac{17}{33} \Rightarrow \alpha = \angle(\vec{AB}, \vec{AC}) \\ &\approx 58,992^\circ \approx 59^\circ \end{aligned}$$

$$b) D = (0, -2, 0), E = (0, 2, 0)$$

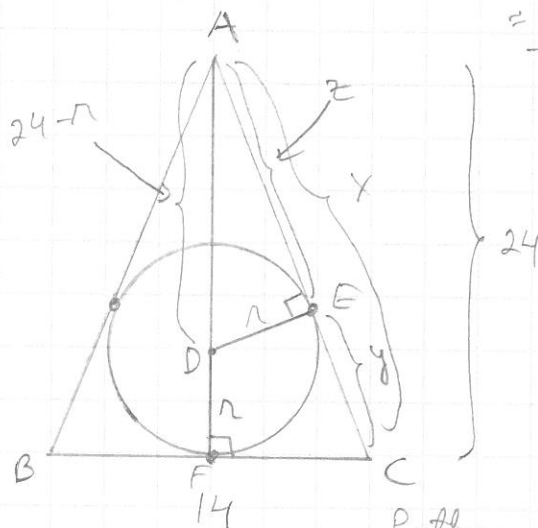
$$\vec{AD} = -2\vec{j} - 5\vec{k}, \vec{AE} = 2\vec{j} - 5\vec{k}$$

$$\cos(\vec{AD}, \vec{AE}) = \dots = \frac{21}{29} \Rightarrow \beta = \angle(\vec{AD}, \vec{AE}) \approx 43,603^\circ \approx 44^\circ$$

12.11



Leistung
=>
Gesamt



$$\triangle ADE \sim \triangle AFC \text{ (BL)}$$

$$1^\circ \angle A \text{ gleiches}$$

$$2^\circ \angle E = \angle F = 90^\circ$$

$$\frac{1}{24-r} = \frac{7}{25} \quad | \times 3 \quad \Rightarrow \dots \Rightarrow r = \frac{21}{4}$$

$$\text{TAI: } y = \frac{14}{2} = 7 \text{ (Symmetrie: EC=FC)}$$

$$z = x - y = 25 - 7 = 18$$

$$\text{Pythagoras: } r^2 + z^2 = (24-r)^2$$

$$\Rightarrow r^2 + 18^2 = 24^2 - 2 \cdot 24 \cdot r + r^2$$

$$\Rightarrow 48r = 24^2 - 18^2 \quad | :48 \quad \Rightarrow r = \frac{21}{4}$$