TBM 1: Kreis & Kreissektor, Pythagoras

(1) a) 57.296° b) 450° c) 67.5° d) 77°

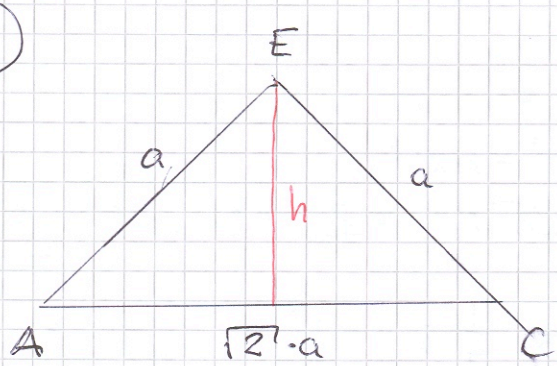
(2) a) 0.5 rad b) 0.01745 rad c) 18.85 rad $= 6\pi$ d) $0.\overline{5}$ rad

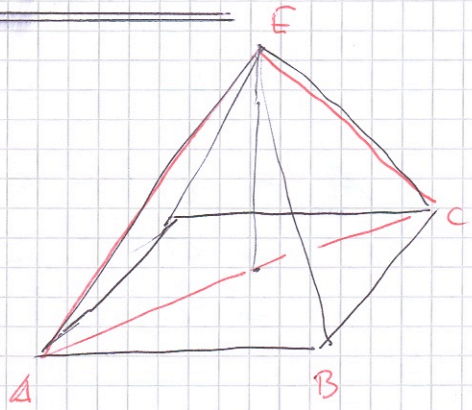
(3) $\alpha = \frac{\pi}{5}$ rad, $R = 4$m ($\alpha = 36°$)

$b = R \cdot \alpha\,\text{rad} = \frac{4\pi}{5}\text{m} = \underline{2.51\text{m}}$

$A_S = \frac{1}{2}R^2 \alpha\,\text{rad} = \underline{5.027\,\text{m}^2}$

(4)





$\overline{AC}$ ist Diagonale des Quadrates (ABCD)
→ gleichsch. rechtw. Dreieck ACE !

$$h = \frac{\sqrt{2}}{2}a$$

(5) 6-Eck = 6 gleichs. Dreiecke, Seite = s

$h = \frac{\sqrt{3}}{2}s \Rightarrow A_{tot} = \frac{1}{2}6 \cdot s \cdot \frac{\sqrt{3}}{2}s = \underline{\frac{1}{2}3\sqrt{3}s^2}$

$$A_{tot} = \frac{3\sqrt{3}}{2}s^2$$

$$s = \sqrt{\frac{2A}{3\sqrt{3}}} = 0.62\text{m}$$

$$\underline{6s = 3.722\text{m}}$$

(6) $U = 5\pi\,cm + 20cm$

Bogenlänge Halbkreis $= 5\cdot\pi\,cm$

$\Rightarrow$ Schenkel des Dreiecks $= 10cm$

$\Rightarrow$ Gleichseitiges Dreieck!

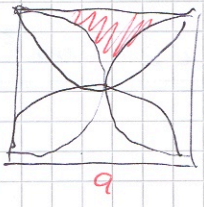
$$A_{tot} = \frac{1}{2}\pi\cdot\left(\frac{d}{2}\right)^2 + \frac{\sqrt{3}}{4}d^2 =$$

$$= 39.27 + 43.3 = \underline{82.57cm^2}$$

(7) $U = 2$ Kreise mit $R = 5cm$, $a = 10cm$

$$= 4\pi R = \underline{62.83cm}$$

A:



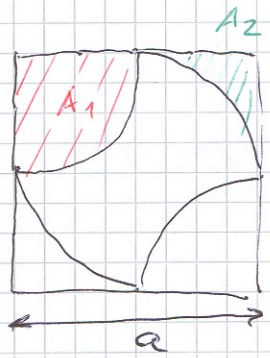
$$A' = \frac{a^2 - \pi R^2}{2}$$

$$A = a^2 - 4A' =$$

$$= a^2 - 2(a^2 - \pi R^2)$$

$$= a^2 - 2a^2 + 2\pi R^2 = 2\pi R^2 - a^2 = \underline{57.08cm^2}$$

(8)



$$A_1 = \frac{1}{4}\pi\left(\frac{a}{2}\right)^2 = \frac{1}{16}\pi a^2$$

$$A_2 = \left(\frac{a}{2}\right)^2 - \frac{1}{4}\pi\left(\frac{a}{2}\right)^2$$

$$= \left(\frac{a}{2}\right)^2\left(1 - \frac{\pi}{4}\right)$$

$$A = a^2 - 2A_1 - 2A_2$$

$$= \underline{4.5m^2 = \frac{1}{2}a^2}$$

$$a^2 - \frac{1}{8}\pi a^2 - 2\left(\frac{a}{2}\right)^2\left(1 - \frac{\pi}{4}\right)$$

$$= a^2 - \frac{1}{8}\pi a^2 - \frac{1}{2}a^2 + \frac{1}{8}\pi a^2 = \underline{\frac{1}{2}a^2}$$

$$U = 2\pi R = 2\pi\cdot 1.5m = \underline{9.42m}$$

(9) $u = 3 \cdot \underbrace{\frac{\pi}{3}}_{=60°} R = \pi R = \underline{62.83\,cm}$

$$A = A_{Sektor}(60°) + 2\left(A_{Sektor} - A_{Dreieck}\right)$$

$$= 3A_S - 2A_\Delta$$

$$= 3\,\frac{\pi R^2}{3 \cdot 2} - 2\,\frac{\sqrt{3}}{4} R^2$$

$$= \frac{1}{2}\pi R^2 - 2\,\frac{\sqrt{3}}{4} R^2$$

$$= R^2\left(\frac{1}{2}\pi - \frac{\sqrt{3}}{2}\right) = \underline{281.91\,cm^2}$$

(10) ΔSMT_1 ist halbes gleichseitiges Dreieck!

a ist die Höhe des gleichs. Dreiecks, wobei $\overline{MT}$ die Seitenlänge des Dreiecks $2R$ beträgt

$$\Rightarrow a = \frac{\sqrt{3}}{2} 2R = \sqrt{3} R = \underline{17.32\,cm}$$