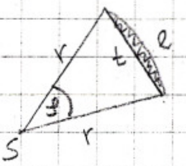
(6) Iz kroga izrežemo pravilni osemnajstkotnik.
Koliko procentov kroga predstavljajo odrezki?

$n = 18$



ODREZKI: $S_O = S_{KR} - S_{18}$

$S_{KR} = \pi r^2$

$\varphi = \frac{360°}{18} = 20°$

$S_{18} = 18 \cdot S_\Delta$

$S_\Delta = \frac{r^2}{2} \cdot \sin\varphi$

$S_{18} = \cancel{18}^{9} \cdot \frac{r^2}{\cancel{2}} \cdot \sin 20°$

$S_{18} = 9r^2 \cdot \sin 20°$

ODREZKI:

$S_O = S_{KR} - S_{18} = \pi r^2 - 9r^2 \cdot \sin 20°$

$\frac{S_O}{S_K} \cdot 100\% =$

$= \frac{\pi r^2 - 9r^2 \cdot \sin 20°}{\pi r^2} \cdot 100\% =$

$= \left(1 - \frac{9\cancel{r^2} \cdot \sin 20°}{\pi \cancel{r^2}}\right) \cdot 100\% =$

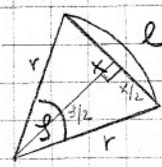
$= \left(1 - \frac{9 \sin 20°}{\pi}\right) \cdot 100\% =$

$= (1 - 0{,}9798) \cdot 100\% =$

$= 0{,}0202 \cdot 100\% = 2{,}02\%$

O: Odrezki predstavljajo 2% kroga.

(5) Krogu je včrtan pravilni devetkotnik. Za koliko odstotkov je krožni lok, ki pripada stranici, večji od stranice?



$$n = 9$$

$$\varphi = \frac{360°}{n} = \frac{360°}{9} = 40°$$

$$l = \frac{\pi r \cdot 40°}{180°}$$

$$\sin\frac{\varphi}{2} = \frac{x/2}{r}$$

$$x/2 = \sin 20° \cdot r \quad / \cdot 2$$

$$x = 2r \cdot \sin 20°$$

$$\frac{l - x}{x} \cdot 100\% =$$

$$= \left(\frac{\pi r \cdot \cancel{40°}^{2}}{{}_{9}\cancel{180°}} - 2r \cdot \sin 20°\right) / 2r \cdot \sin 20° \cdot 100\% =$$

$$= \frac{\pi r \cdot 2 - 18 r \cdot \sin 20°}{9} \cdot \frac{1}{2r \cdot \sin 20°} \cdot 100\% =$$

$$= \frac{\cancel{r}(2\pi - 18 \cdot \sin 20°)}{9} \cdot \frac{1}{2\cancel{r} \cdot \sin 20°} \cdot 100\% =$$

$$= \frac{\cancel{2}(\pi - 9 \sin 20°)}{9 \cdot \cancel{2} \cdot \sin 20°} \cdot 100\% =$$

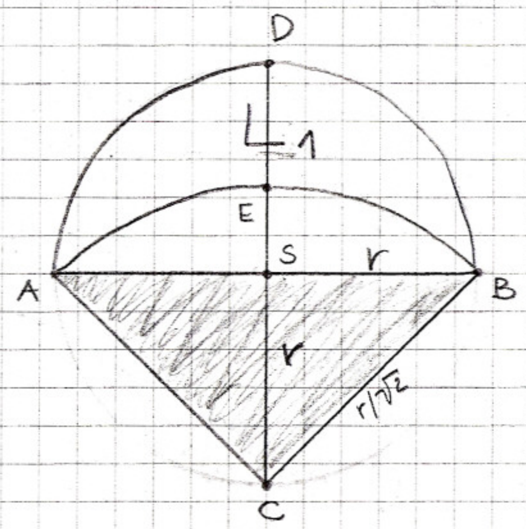
$$= \frac{\pi - 9 \cdot \sin 20°}{9 \cdot \sin 20°} \cdot 100\% =$$

$$= \left(\frac{\pi}{9 \cdot \sin 20°} - 1\right) \cdot 100\% =$$

$$= 0{,}021 \cdot 100\% = 2{,}1\%$$

O: Krožni lok je za 2,1 % večji od stranice devetkotnika.

(7) V krogu s polmerom r načrtamo pravokotna premera AB in CD ter krog s središčem C in polmerom CA. Dokažimo, da je trikotnik ACB ploščinsko enak liku, ki ga omejujeta polkrog ADB in lok AEB (lunin krajec).



$S_{\triangle ACB} = S(L_1)$

DOKAŽI!

$S_{\triangle ACB} = \frac{2r \cdot r}{2} = r^2$

$S(L) = \frac{S_{KR.}}{2} - S_{OD\text{-}ABE}$

$S_{KR} = \pi r^2$

$S_{OD\,ABE} = S_{iz} - S_{\triangle} = \frac{\pi \cdot (r\sqrt{2})^2}{4} - r^2$

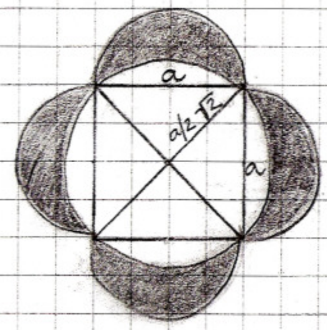
$S(L_1) = \frac{\pi r^2}{2} - \frac{\pi (r\sqrt{2})^2}{4} + r^2$

$S(L_1) = \frac{2\pi r^2 - \pi r^2 \cdot 2 + 4r^2}{4}$

$S(L_1) = r^2$ $\qquad$ $S_{\triangle ABC} = r^2$

$S(L) = S_{\triangle ABC}$ ✓

(8) Nad stranicami kvadrata načrtajmo polkroge na zunanjo stran in izrežimo krog, ki je kvadratu očrtan. Kolikšna je ploščina nastalega lika?



$S_L = ?$

$S_L = 4 \cdot S$

$S = \frac{S_{KR}}{2} - S_{OD}$

$S_{KR} = \pi r^2 = \pi \cdot \left(\frac{a}{2}\right)^2 = \frac{a^2}{4}\pi$

$S_{OD} = S_{iz} - S_{\Delta} = \frac{(a/2\cdot\sqrt{2})^2\pi}{4} - \frac{a\cdot a/2}{2}$

$S_{OD} = \frac{\frac{2a^2}{4}\cdot\pi}{4} - \frac{\frac{a^2}{2}}{2} = \frac{2a^2\pi}{16} - \frac{a^2}{4} = \frac{2a^2\pi - 4a^2}{16}$

$S_{OD} = \frac{\cancel{2}^{1}a^2(\pi - 2)}{\cancel{16}\,8}$

$S = \frac{S_{KR}}{2} - S_{OD} = \left(\frac{a^2}{4}\pi/2\right) - \frac{a^2(\pi-2)}{8} =$

$= \frac{a^2\cdot\pi}{8} - \frac{a^2\pi - 2a^2}{8} = \frac{a^2\pi - a^2\pi + 2a^2}{8} = \frac{\cancel{2}^{1}a^2}{\cancel{8}\,4} = \frac{a^2}{4}$

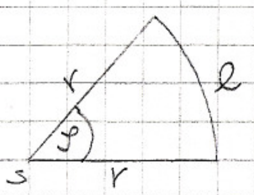
$S_L = 4\cdot S = \cancel{4}\cdot\frac{a^2}{\cancel{4}} = a^2$

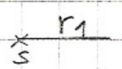
O: Ploščina nastalega lika meri a^2.

DOMAČA NALOGA 27.9.0

Učb. str. 213/7, 8, 10

7. Lok kroga s polmerom 9 cm in središčnim kotom 80° zvij v krog. Kolikšen je polmer novega kroga?





$r = 9\,cm$
$\varphi = 80°$

$l = o$
$r_1 = ?$

$l = \frac{\pi r\alpha}{180°}$

$l = \frac{\pi\cdot\cancel{9}^{1}cm\cdot\cancel{80°}^{4}}{\cancel{180°}\,\cancel{20}\,1}$

$l = 4\pi\,cm$

$l = o$
$l = 2\pi r_1$

$4\pi\,cm = 2\pi r_1 \quad /:\pi$
$4\,cm = 2r_1 \quad /:2$
$2\,cm = r_1$
$r_1 = 2\,cm$

Polmer novega kroga je 2cm.