

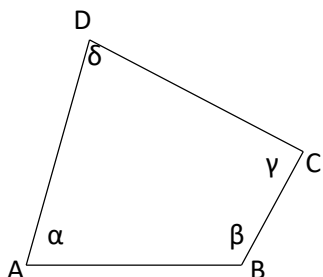


## UGLOVI ČETVOROUGLA

(vježbanje)

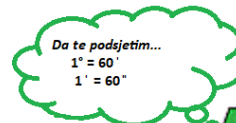
### ZADACI:

1. Izračunaj mjeru četvrtog unutrašnjeg ugla četvorougla ABCD ako su mjere tri ugla  $70^{\circ}10'$ ,  $125^{\circ}20'$ ,  $100^{\circ}30'$ .

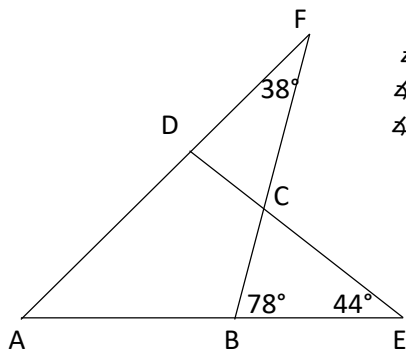


$$\begin{aligned} \alpha &= 70^{\circ}10' \\ \beta &= 125^{\circ}20' \\ \gamma &= 100^{\circ}30' \\ \delta &=? \end{aligned}$$

$$\begin{aligned} \alpha + \beta + \gamma + \delta &= 360^{\circ} \\ 70^{\circ}10' + 125^{\circ}20' + 100^{\circ}30' + \delta &= 360^{\circ} \\ 295^{\circ}60' + \delta &= 360^{\circ} \\ 296^{\circ} + \delta &= 360^{\circ} \\ \delta &= 360^{\circ} - 296^{\circ} \\ \delta &= 64^{\circ} \end{aligned}$$

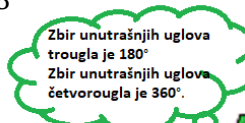


2. Izračunaj uglove četvorougla ABCD na slici



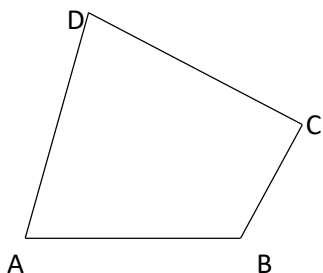
$$\begin{aligned} \sphericalangle ECB &= 180^{\circ} - (78^{\circ} + 44^{\circ}) = 180^{\circ} - 122^{\circ} = 58^{\circ} \\ \sphericalangle DCF &= \sphericalangle ECB = 58^{\circ} \text{ (unakrsni uglovi)} \\ \sphericalangle FDC &= 180^{\circ} - (38^{\circ} + 58^{\circ}) = 180^{\circ} - 96^{\circ} = 84^{\circ} \\ \gamma_1 &= 58^{\circ}, \delta_1 = 84^{\circ}, \beta_1 = 78^{\circ} \end{aligned}$$

$$\begin{array}{lll} \beta + \beta_1 = 180^{\circ} & \gamma + \gamma_1 = 180^{\circ} & \delta + \delta_1 = 180^{\circ} \\ \beta + 78^{\circ} = 180^{\circ} & \gamma + 58^{\circ} = 180^{\circ} & \delta + 84^{\circ} = 180^{\circ} \\ \beta = 180^{\circ} - 78^{\circ} & \gamma = 180^{\circ} - 58^{\circ} & \delta = 180^{\circ} - 84^{\circ} \\ \beta = 102^{\circ} & \gamma = 122^{\circ} & \delta = 96^{\circ} \end{array}$$

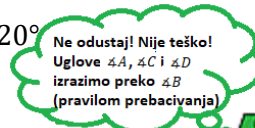


$$\begin{aligned} \alpha + \beta + \gamma + \delta &= 360^{\circ} \\ \alpha + 102^{\circ} + 122^{\circ} + 96^{\circ} &= 360^{\circ} \\ \alpha + 320^{\circ} &= 360^{\circ} \\ \alpha &= 360^{\circ} - 320^{\circ} \\ \alpha &= 40^{\circ} \end{aligned}$$

3. Izračunaj uglove četvorougla ako se  $\sphericalangle A$  i  $\sphericalangle B$ ,  $\sphericalangle B$  i  $\sphericalangle C$ ,  $\sphericalangle C$  i  $\sphericalangle D$  razlikuju za po  $10^{\circ}$ .



$$\begin{aligned} \sphericalangle A - \sphericalangle B &= 10^{\circ} \Rightarrow \sphericalangle A = 10^{\circ} + \sphericalangle B \\ \sphericalangle B - \sphericalangle C &= 10^{\circ} \Rightarrow \sphericalangle C = \sphericalangle B - 10^{\circ} \\ \sphericalangle C - \sphericalangle D &= 10^{\circ} \Rightarrow \sphericalangle D = \sphericalangle C - 10^{\circ} = \\ &= \sphericalangle B - 10^{\circ} - 10^{\circ} = \sphericalangle B - 20^{\circ} \\ \sphericalangle A + \sphericalangle B + \sphericalangle C + \sphericalangle D &= 360^{\circ} \\ 10^{\circ} + \sphericalangle B + \sphericalangle B + \sphericalangle B - 10^{\circ} + \sphericalangle B - 20^{\circ} &= 360^{\circ} \\ 4 \cdot \sphericalangle B - 20^{\circ} &= 360^{\circ} \\ 4 \cdot \sphericalangle B &= 360^{\circ} + 20^{\circ} \\ 4 \cdot \sphericalangle B &= 380^{\circ} \end{aligned}$$





$$\sphericalangle B = 380^\circ : 4$$

$$\sphericalangle B = 95^\circ$$

$$\sphericalangle A = 10^\circ + \sphericalangle B$$

$$\sphericalangle A = 10^\circ + 95^\circ$$

$$\sphericalangle A = 105^\circ$$

$$\sphericalangle C = \sphericalangle B - 10^\circ$$

$$\sphericalangle C = 95^\circ - 10^\circ$$

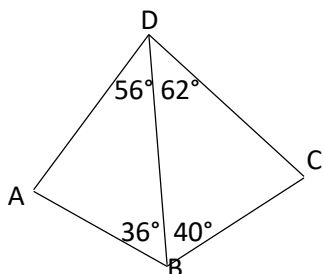
$$\sphericalangle C = 85^\circ$$

$$\sphericalangle D = \sphericalangle B - 20^\circ$$

$$\sphericalangle D = 95^\circ - 20^\circ$$

$$\sphericalangle D = 75^\circ$$

4. Dijagonala BD četvorougla ABCD dijeli  $\sphericalangle B$  na uglove od  $36^\circ$  i  $40^\circ$ , a ugao kod tjemena  $\sphericalangle D$  na uglove od  $56^\circ$  i  $62^\circ$ . Izračunati uglove četvorougla ABCD.

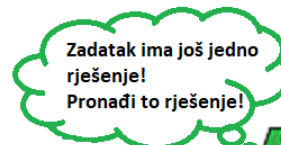


$$\sphericalangle D = 56^\circ + 62^\circ = 118^\circ$$

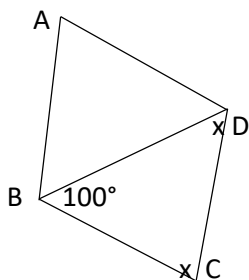
$$\sphericalangle B = 36^\circ + 40^\circ = 76^\circ$$

$$\sphericalangle A = 180^\circ - (56^\circ + 36^\circ) = 180^\circ - 92^\circ = 88^\circ$$

$$\sphericalangle C = 180^\circ - (62^\circ + 40^\circ) = 180^\circ - 102^\circ = 78^\circ$$



5. Dijagonala BD dijeli četvorougao ABCD na jednakostranični  $\triangle ABD$  i jednakokraki  $\triangle BCD$  ( $BD=BC$ ). Ako je  $\sphericalangle DBC=100^\circ$  izračunaj ostale uglove četvorougla.



$$\triangle ABD \text{ jednakostranični} \Rightarrow \text{svi unutrašnji uglovi jednaki i iznose po } 60^\circ$$

$$\Rightarrow \sphericalangle DBA = 60^\circ, \sphericalangle BAD = 60^\circ, \sphericalangle ADB = 60^\circ$$

$$\triangle BCD \text{ jednakokraki} \Rightarrow CD \text{ osnovica i uglovi na njoj jednaki}(x)$$

$$x+x+100^\circ=180^\circ$$

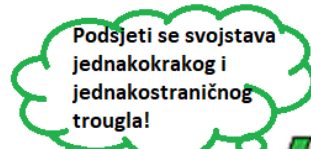
$$2 \cdot x+100^\circ=180^\circ$$

$$2 \cdot x=180^\circ-100^\circ$$

$$2 \cdot x=80^\circ$$

$$x=80^\circ : 2$$

$$x=40^\circ$$



$$\Rightarrow \sphericalangle DBC = 100^\circ, \sphericalangle BCD = 40^\circ, \sphericalangle CDB = 40^\circ$$

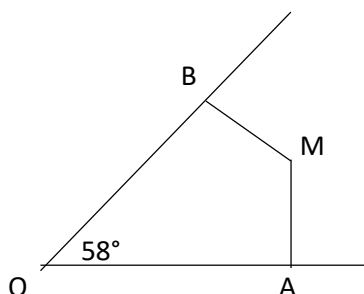
$$\text{Dakle, uglovi četvorougla su } \sphericalangle ABC = 60^\circ + 100^\circ = 160^\circ$$

$$\sphericalangle BCD = x = 40^\circ$$

$$\sphericalangle CDA = 60^\circ + 40^\circ = 100^\circ$$

$$\sphericalangle DAB = 60^\circ$$

6. Neka je tačka M u oblasti datog ugla. Neka su P i Q podnožja normala spuštenih iz tačke M na krake Ox i Oy ugla xOy. Izračunaj uglove četvorougla OMPQ.



$$\sphericalangle AOB = 58^\circ$$

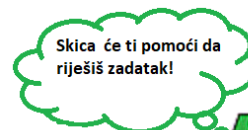
$$\sphericalangle OAM = 90^\circ$$

$$\sphericalangle OBM = 90^\circ$$

$$\sphericalangle AMB = 360^\circ - (58^\circ + 90^\circ + 90^\circ) =$$

$$= 360^\circ - 238^\circ =$$

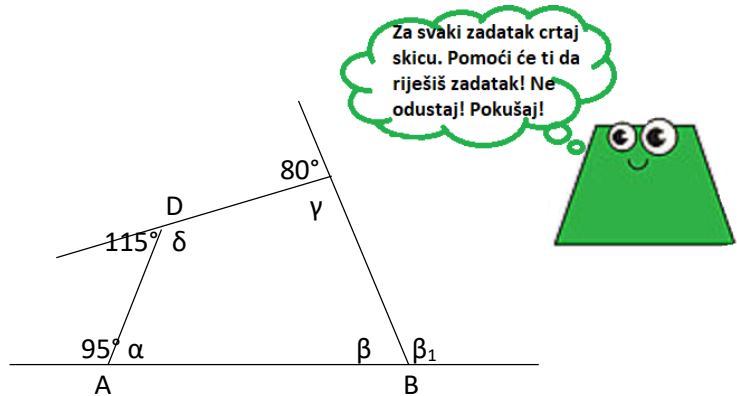
$$= 122^\circ$$





ZADACI ZA SAMOSTALNO RJEŠAVANJE:

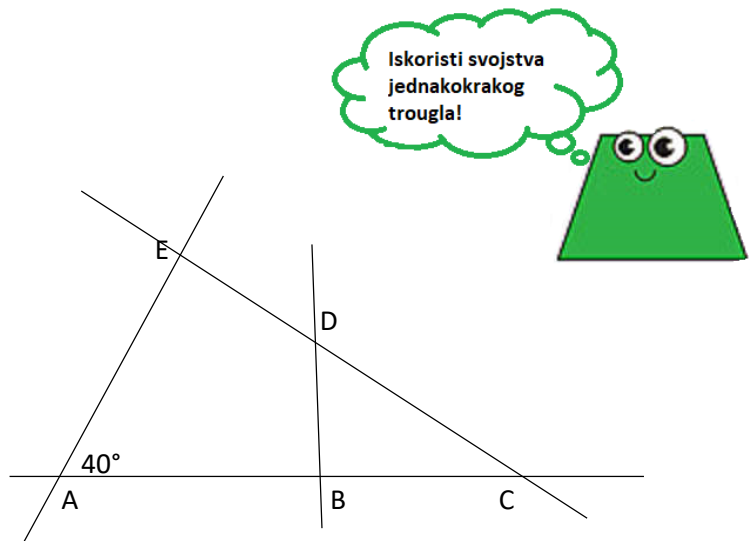
1. Izračunaj unutrašnje i spoljašnje uglove četvorougla na slici.



2. Izračunaj unutrašnje  $\alpha, \beta, \gamma, \delta$  četvorougla ako važe relacije  $\alpha + \beta + \gamma = 240^\circ$ ,  $\beta + \gamma + \delta = 285^\circ$ ,  $\alpha + \gamma + \delta = 300^\circ$ .

3. Dijagonala BD dijeli četvorougao ABCD na dva jednakokraka trougla čija je osnovica ta dijagonala. Ako su veličine uglova naspram dijagonale jednaki  $142^\circ$  i  $76^\circ$ , izračunaj veličine ostalih uglova četvorougla ABCD.

4. Ako je  $AE = EC$  i  $BC = DC$  izračunaj uglove četvorougla ABDE.





**Domaći zadatak:** zbirka zadataka

|        |                     |
|--------|---------------------|
| strana | 101                 |
| zadaci | 950(slika 1.7), 958 |



- ❖ Sadržaj ovog nastavnog materijala prepisati u školsku svesku
- ❖ Zadatke za samostalni rad riješiti
- ❖ U cilju boljeg razumjevanja gradiva pogledati video:  
[https://youtu.be/ tQPbghz9pA](https://youtu.be/tQPbghz9pA)
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