

Úhly

6. ročník

jméno:

třída:

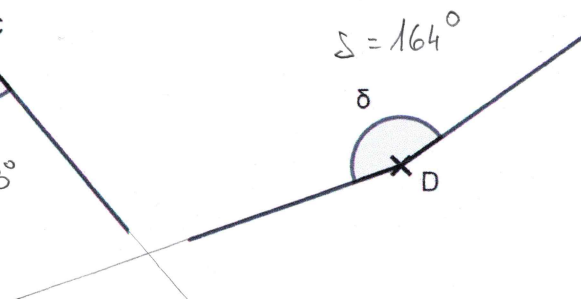
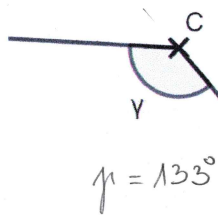
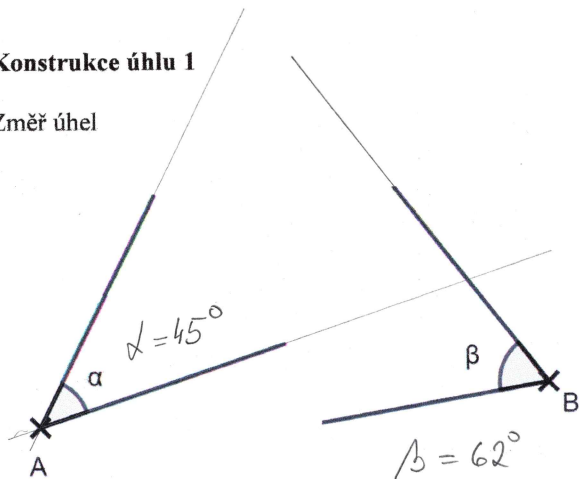
Řešení : sedovamatika.cz

„Některé z příkladů použité v tomto pdf jsou převzaty z materiálů Cermatu (www.cermat.cz), které slouží jako příklady pro přijímací zkoušky a testy.“

aktualizováno: 12. 8. 2025

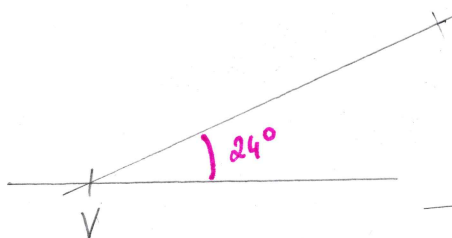
Konstrukce úhlu 1

Změř úhel

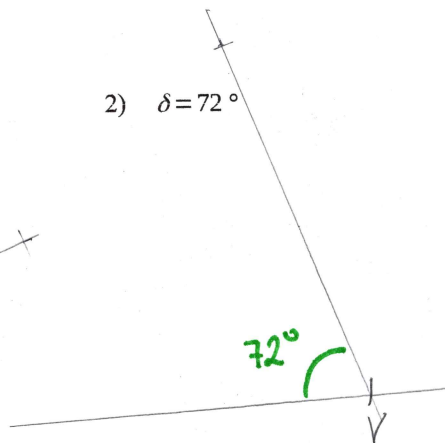


Sestroj úhel.

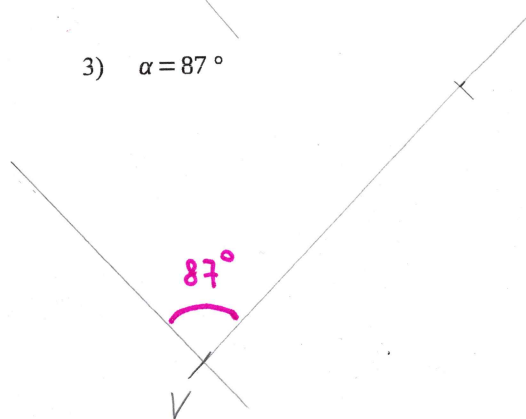
1) $\beta = 24^\circ$



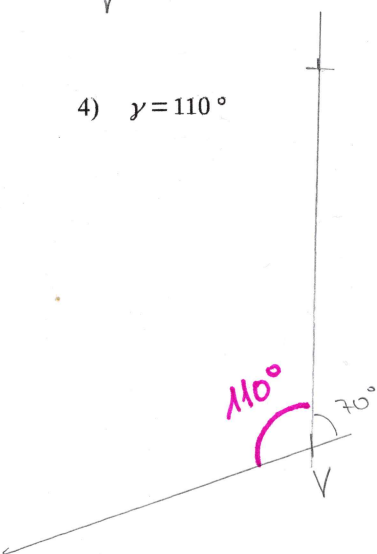
2) $\delta = 72^\circ$



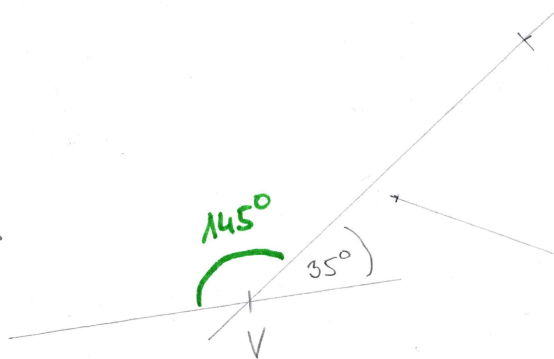
3) $\alpha = 87^\circ$



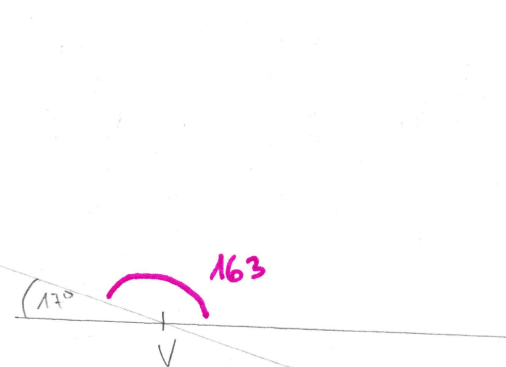
4) $\gamma = 110^\circ$



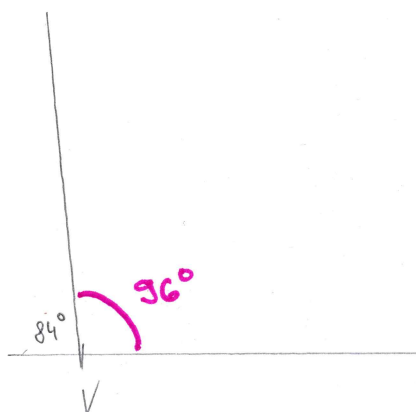
5) $\varepsilon = 145^\circ$



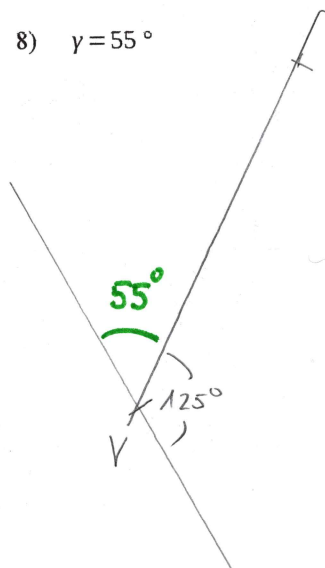
6) $\alpha = 163^\circ$



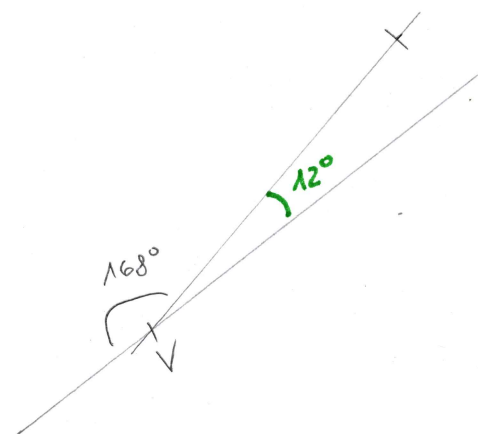
7) $\omega = 96^\circ$



8) $\gamma = 55^\circ$

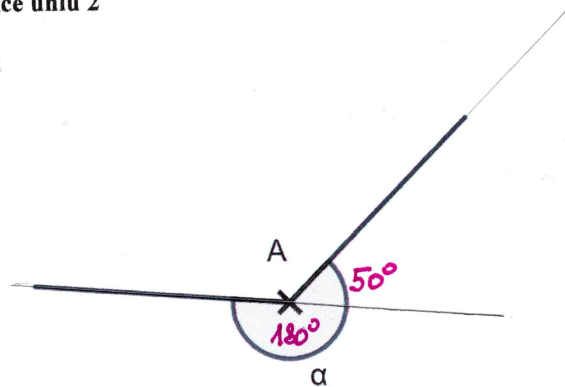


9) $\delta = 12^\circ$

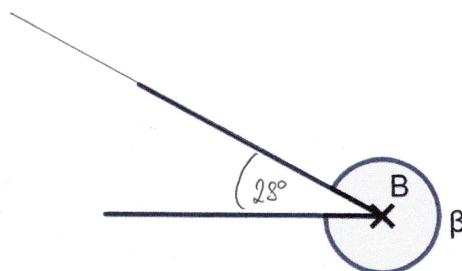


Konstrukce úhlu 2

Změř úhel



$$\alpha = 180^\circ + 50^\circ = 230^\circ$$

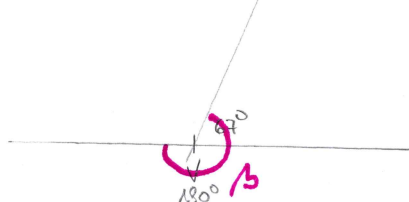


$$\beta = 360^\circ - 28^\circ = 332^\circ$$

Sestroj úhel.

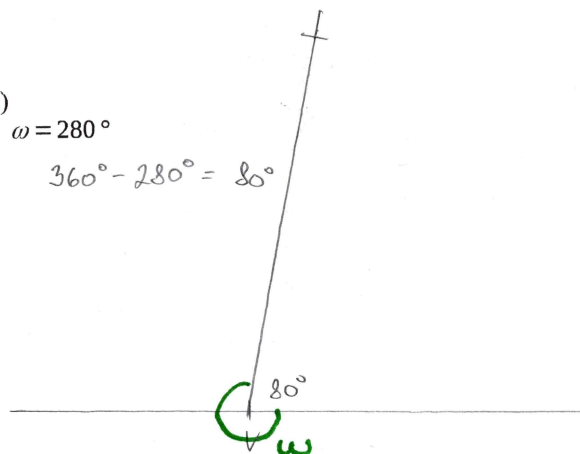
1) $\beta = 247^\circ$

$$180^\circ + 67^\circ$$



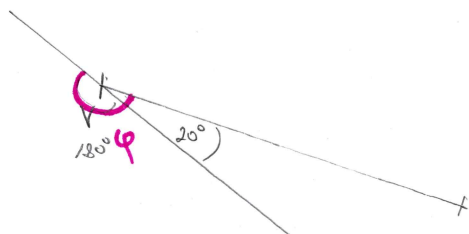
2) $\omega = 280^\circ$

$$360^\circ - 80^\circ = 80^\circ$$



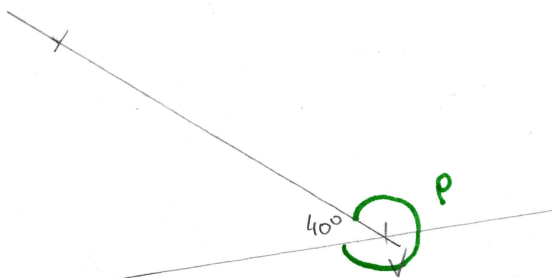
3) $\varphi = 200^\circ$

$$180^\circ + 20^\circ$$



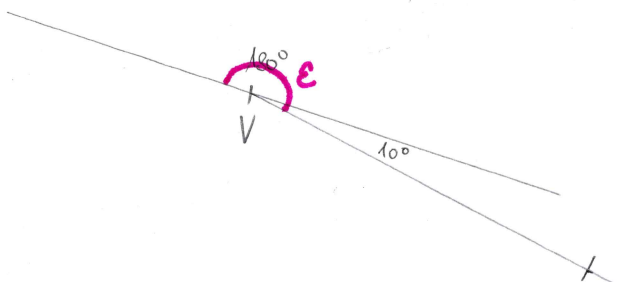
4) $\rho = 320^\circ$

$$360^\circ - 40^\circ = 40^\circ$$



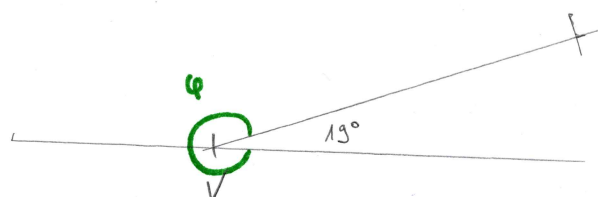
5) $\varepsilon = 190^\circ$

$$180^\circ + 10^\circ$$



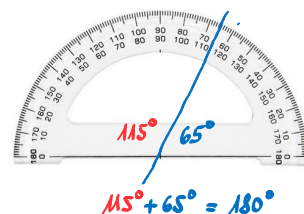
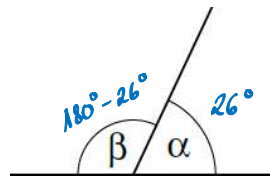
6) $\varphi = 341^\circ$

$$360^\circ - 19^\circ = 19^\circ$$



Stupně a minuty 1

Úhly alfa a beta jsou vedlejší. Dopačítej chybějící úhel.



1)

$$\alpha = 26^\circ$$

$$\beta = 154^\circ$$

$$\beta = 180^\circ - 26^\circ = 154^\circ$$

2)

$$\alpha = 66^\circ$$

$$\beta = 114^\circ$$

$$\alpha = 180^\circ - 114^\circ = 66^\circ$$

3)

$$\alpha = 47^\circ$$

$$\beta = 133^\circ$$

$$\beta = 180^\circ - 47^\circ = 133^\circ$$

4)

$$\alpha = 31^\circ$$

$$\beta = 149^\circ$$

$$\alpha = 180^\circ - 149^\circ = 31^\circ$$

5)

$$3^\circ 52' - 1^\circ 32' = 2^\circ 20'$$

$$3\text{h } 52\text{ min} - 1\text{h } 32\text{ min}$$

$$3^\circ - 1^\circ = 2^\circ$$

$$52' - 32' = 20'$$

6)

$$1^\circ - 27' = 60' - 27' = 33'$$

$$1\text{h} - 27\text{ min}$$

7)

$$24^\circ 17' - 18^\circ 35' = 5^\circ 42'$$

$$24\text{h } 17\text{ min} - 18\text{h } 35\text{ min}$$

$$1\text{h} \rightarrow 60\text{ min}$$

$$24^\circ 17' \rightarrow 23^\circ 77'$$

$$1^\circ = 60'$$

$$\begin{array}{r} 23^\circ \\ - 18^\circ \\ \hline 5^\circ \end{array} \quad \begin{array}{r} 77' \\ - 35' \\ \hline 42' \end{array}$$

8)

$$\alpha = 80^\circ 08'$$

$$\beta = 99^\circ 52'$$

$$\beta = 180^\circ - 80^\circ 8'$$

$$\rightarrow 179^\circ 60'$$

$$\begin{array}{r} 179^\circ \\ - 80^\circ \\ \hline 99^\circ \end{array} \quad \begin{array}{r} 60' \\ - 8' \\ \hline 52' \end{array}$$

9)

$$\alpha = 24^\circ 35'$$

$$\beta = 155^\circ 25'$$

$$\alpha = 180^\circ - 155^\circ 25'$$

$$\rightarrow 179^\circ 60' - 155^\circ 25'$$

10)

$$\alpha = 67^\circ 17'$$

$$\beta = 12^\circ 43'$$

$$\beta = 180^\circ - 67^\circ 17'$$

$$\rightarrow 179^\circ 60'$$

$$\begin{array}{r} 179^\circ 60' \\ - 67^\circ 17' \\ \hline 12^\circ 43' \end{array}$$

11)

$$\alpha = 82^\circ 11'$$

$$\beta = 97^\circ 49'$$

$$82^\circ 11'$$

12)

$$\alpha = 143^\circ 23'$$

$$\beta = 36^\circ 37'$$

$$143^\circ 23'$$

13)

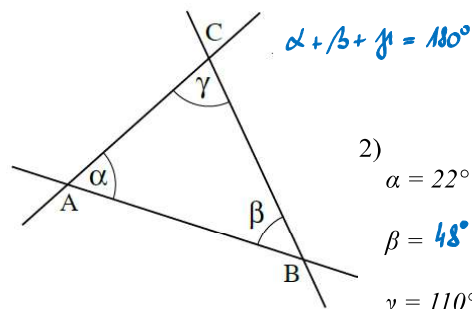
$$\alpha = 54^\circ 47'$$

$$\beta = 125^\circ 13'$$

$$54^\circ 47'$$

Stupně a minuty 2

Dopočítej úhly podle obrázku.



1)

$$\left. \begin{array}{l} \alpha = 34^\circ \\ \beta = 90^\circ \end{array} \right\} 124^\circ$$

$$\gamma = 56^\circ$$

$$\gamma = 180^\circ - 124^\circ = 56^\circ$$

2)

$$\left. \begin{array}{l} \alpha = 22^\circ \\ \beta = 48^\circ \end{array} \right\} 110^\circ$$

$$\gamma = 110^\circ$$

$$\beta = 180^\circ - 110^\circ - 22^\circ = 180^\circ - 132^\circ = 48^\circ$$

3)

$$\left. \begin{array}{l} \alpha = 20^\circ \\ \beta = 60^\circ \end{array} \right\} 80^\circ$$

$$\gamma = 100^\circ$$

$$\gamma = 180^\circ - 80^\circ = 100^\circ$$

4)

$$\left. \begin{array}{l} \alpha = 49^\circ \\ \beta = 66^\circ \end{array} \right\} 115^\circ$$

$$\gamma = 65^\circ$$

$$\gamma = 180^\circ - 115^\circ = 65^\circ$$

5)

$$\left. \begin{array}{l} \alpha = 20^\circ 16' \\ \beta = 35^\circ \end{array} \right\} 55^\circ 16'$$

$$\gamma = 124^\circ 44'$$

$$\gamma = 180^\circ - 55^\circ 16' = 124^\circ 44'$$

$$\begin{array}{r} 179^\circ \quad 60' \\ - 55^\circ \quad 16' \\ \hline 124^\circ \quad 44' \end{array}$$

6)

$$\left. \begin{array}{l} \alpha = 35^\circ 15' \\ \beta = 120^\circ 15' \end{array} \right\} 155^\circ 30'$$

$$\gamma = 24^\circ 30'$$

$$\begin{array}{r} 179^\circ \quad 60' \\ - 155^\circ \quad 30' \\ \hline 24^\circ \quad 30' \end{array}$$

7)

$$\left. \begin{array}{l} \alpha = 50^\circ 50' \\ \beta = 37^\circ 23' \end{array} \right\} 128^\circ 70' = 129^\circ 10'$$

$$\gamma = 91^\circ 47'$$

$$\alpha = 180^\circ - 129^\circ 10' = 50^\circ 50'$$

$$\begin{array}{r} 179^\circ \quad 60' \\ - 129^\circ \quad 10' \\ \hline 50^\circ \quad 50' \end{array}$$

8)

$$\left. \begin{array}{l} \alpha = 65^\circ 27' \\ \beta = 33^\circ 38' \end{array} \right\} 98^\circ 65' = 99^\circ 5'$$

$$\gamma = 80^\circ 55'$$

$$\gamma = 180^\circ - 99^\circ 5' = 80^\circ 55'$$

$$\begin{array}{r} 179^\circ \quad 60' \\ - 99^\circ \quad 5' \\ \hline 80^\circ \quad 55' \end{array}$$

9)

$$\left. \begin{array}{l} \alpha = 42^\circ 53' \\ \beta = 29^\circ 59' \end{array} \right\} 136^\circ 67' = 137^\circ 7'$$

$$\gamma = 107^\circ 08'$$

$$\alpha = 180^\circ - 137^\circ 7' = 42^\circ 53'$$

$$\begin{array}{r} 179^\circ \quad 60' \\ - 137^\circ \quad 7' \\ \hline 42^\circ \quad 53' \end{array}$$

10)

$$\left. \begin{array}{l} \alpha = 73^\circ 25' \\ \beta = 63^\circ 45' \end{array} \right\} 136^\circ 70' = 137^\circ 10'$$

$$\gamma = 42^\circ 50'$$

$$\gamma = 180^\circ - 137^\circ 10' = 42^\circ 50'$$

$$\begin{array}{r} 179^\circ \quad 60' \\ - 137^\circ \quad 10' \\ \hline 42^\circ \quad 50' \end{array}$$

11)

$$\left. \begin{array}{l} \alpha = 37^\circ 59' \\ \beta = 18^\circ 43' \end{array} \right\} 160^\circ 77' = 161^\circ 17'$$

$$\gamma = 123^\circ 18'$$

$$\beta = 180^\circ - 161^\circ 17' = 18^\circ 43'$$

$$\begin{array}{r} 179^\circ \quad 60' \\ - 161^\circ \quad 17' \\ \hline 18^\circ \quad 43' \end{array}$$

12)

$$\left. \begin{array}{l} \alpha = 77^\circ 9' \\ \beta = 42^\circ 11' \end{array} \right\} 119^\circ 20'$$

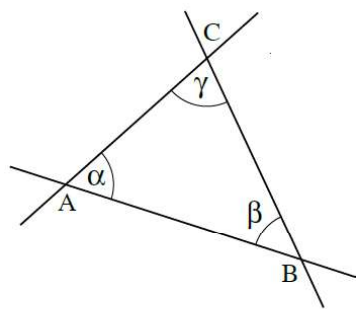
$$\gamma = 60^\circ 40'$$

$$\gamma = 180^\circ - 119^\circ 20' = 60^\circ 40'$$

Stupně a minuty 3

Dopočítej úhly podle obrázku.

[bez videa]



1)
 $\alpha = 31^\circ 54'$
 $\beta = 90^\circ$
 $\gamma = 58^\circ 6'$

2)
 $\alpha = 22^\circ 15'$
 $\beta = 44^\circ 23'$
 $\gamma = 113^\circ 22'$

3)
 $\alpha = 20^\circ 15'$
 $\beta = 57^\circ 45'$
 $\gamma = 102^\circ$

4)
 $\alpha = 69^\circ 32'$
 $\beta = 26^\circ 59'$
 $\gamma = 83^\circ 29'$

5)
 $\alpha = 29^\circ 26'$
 $\beta = 35^\circ 37'$
 $\gamma = 114^\circ 51'$

6)
 $\alpha = 135^\circ 15'$
 $\beta = 20^\circ 42'$
 $\gamma = 24^\circ 3'$

7)
 $\alpha = 60^\circ 50'$
 $\beta = 57^\circ 23'$
 $\gamma = 61^\circ 47'$

8)
 $\alpha = 55^\circ 67'$
 $\beta = 32^\circ 18'$
 $\gamma = 31^\circ 35'$

9)
 $\alpha = 23^\circ 43'$
 $\beta = 79^\circ 9'$
 $\gamma = 77^\circ 8'$

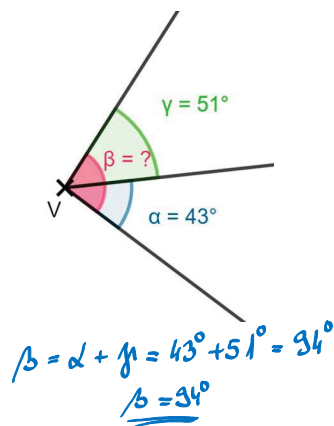
10)
 $\alpha = 53^\circ 25'$
 $\beta = 93^\circ 36'$
 $\gamma = 32^\circ 53'$

11)
 $\alpha = 15^\circ 24'$
 $\beta = 83^\circ 29'$
 $\gamma = 81^\circ 7'$

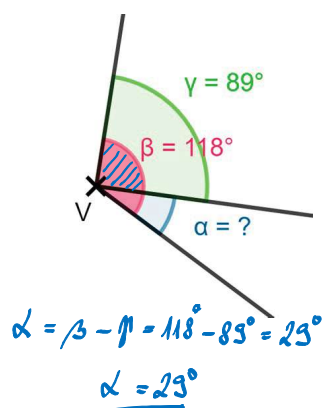
12)
 $\alpha = 78^\circ 44'$
 $\beta = 53^\circ 26'$
 $\gamma = 47^\circ 50'$

Sčítání a odčítání úhlů
Dopočítej chybějící úhly.

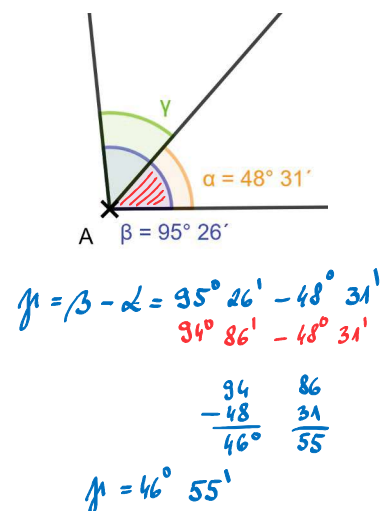
1)



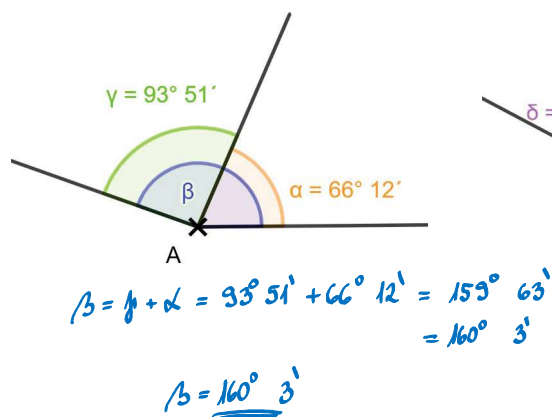
2)



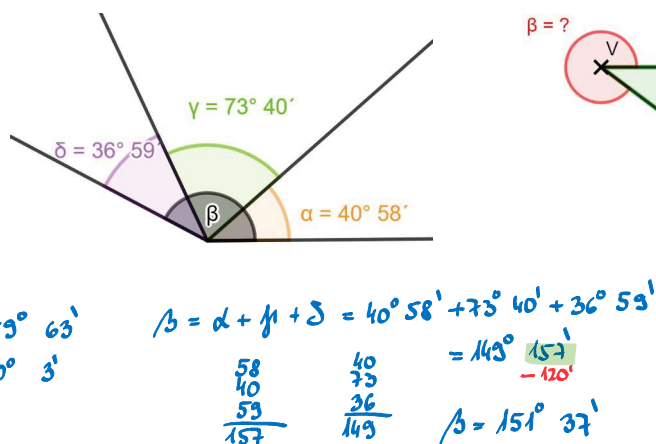
3)



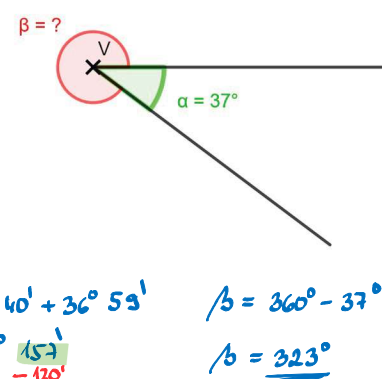
4)



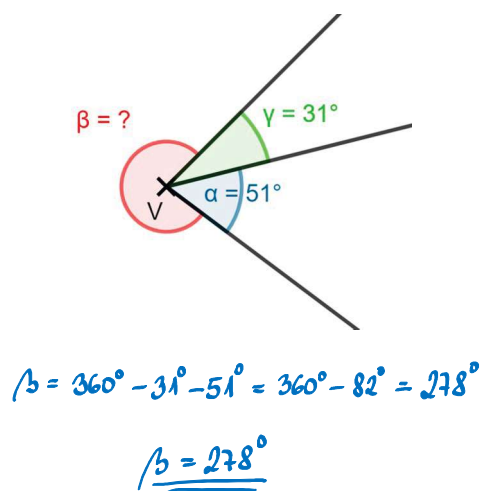
5)



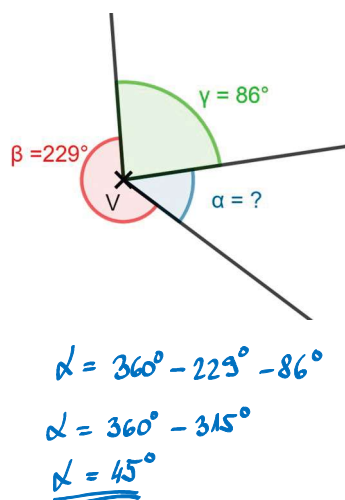
6)



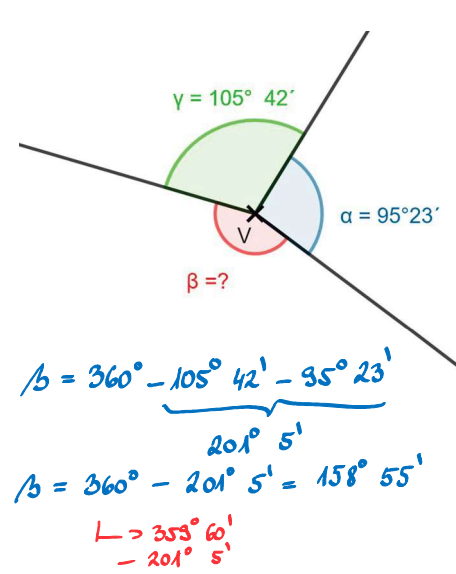
7)



8)



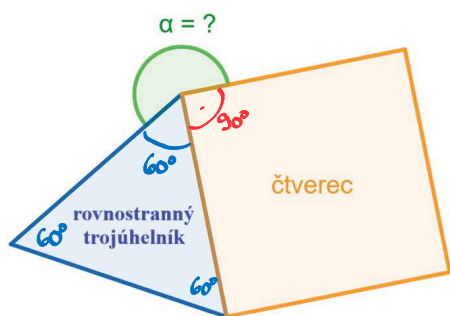
9)



Mnohoúhelníky 1

Dopočítej chybějící úhly.

1)



$$\alpha = 360^\circ - 60^\circ - 90^\circ = 210^\circ$$

$$\alpha = 210^\circ$$

2)

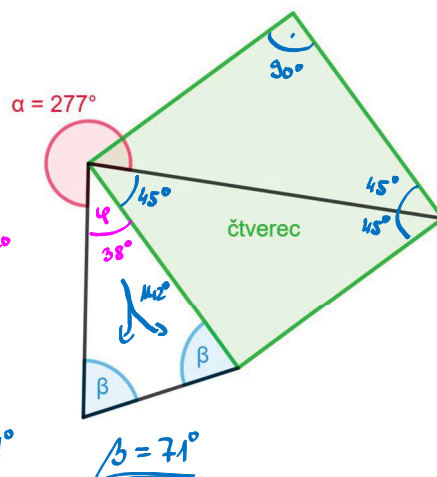
$$\varphi = 360^\circ - 277^\circ - 45^\circ$$

$$\varphi = 360^\circ - 322^\circ$$

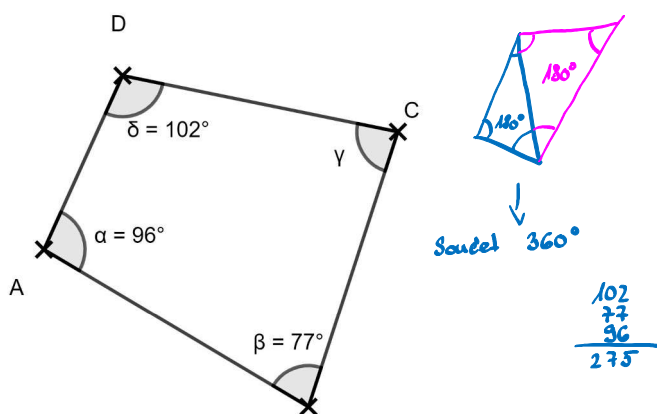
$$\varphi = 38^\circ$$

$$180^\circ - 38^\circ = 142^\circ$$

$$142^\circ : 2 = 71^\circ$$



3)

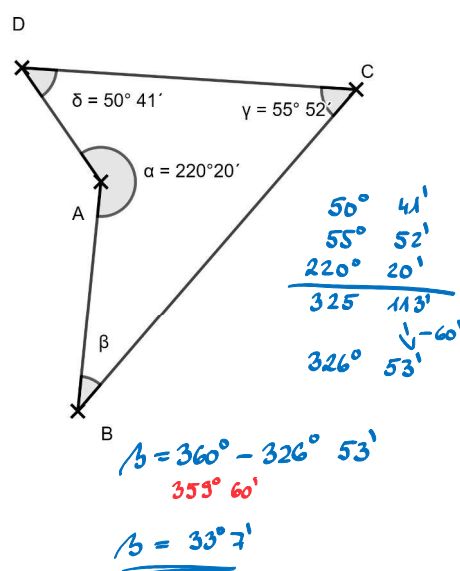


$$\gamma = 360^\circ - \alpha - \beta - \delta = 360^\circ - 96^\circ - 77^\circ - 102^\circ$$

$$\gamma = 360^\circ - 275^\circ = 85^\circ$$

$$\gamma = 85^\circ$$

4)



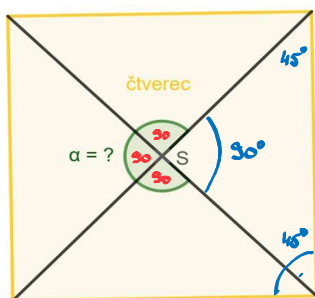
$$\beta = 360^\circ - 326^\circ 53'$$

$$\beta = 33^\circ 7'$$

5) Vypočítejte úhel alfa v pravidelném čtyř-úhelníku (čtverec).

6) Vypočítejte úhel alfa v pravidelném šesti-úhelníku.

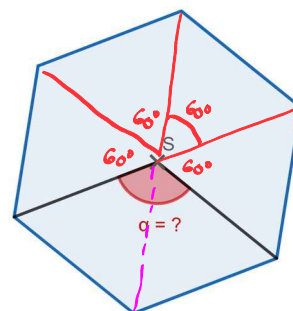
$$360 : 4 = 90^\circ$$



$$\alpha = 270^\circ$$

$$360 : 6 = 60^\circ$$

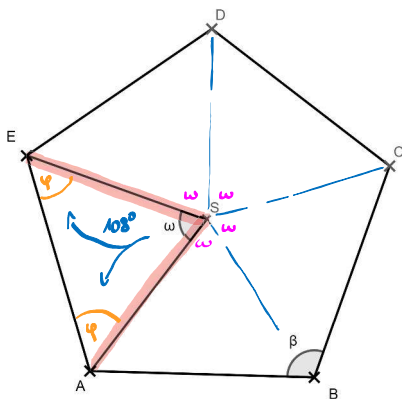
$$\alpha = 120^\circ$$



Mnohoúhelníky 2

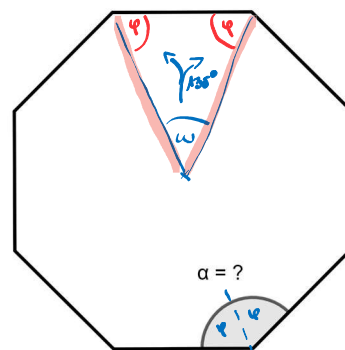
1) Vypočítejte úhel beta a omega v pravidelném pěti-úhelníku.

$$\begin{aligned}\omega &= 360 : 5 = 72^\circ \\ \omega &= 72^\circ \\ 180^\circ - 72^\circ &= 108^\circ \\ \varphi &= 54^\circ \\ \beta &= 108^\circ\end{aligned}$$



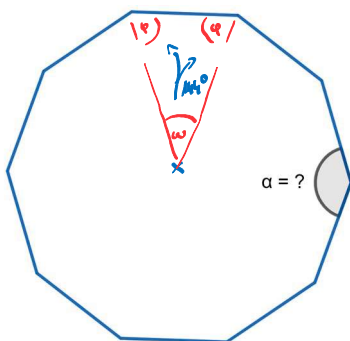
2) Vypočítejte úhel alfa v pravidelném osmi-úhelníku.

$$\begin{aligned}\omega &= 360 : 8 = 45^\circ \\ 180^\circ - 45^\circ &= 135^\circ \\ \varphi &= 135 : 2 = 67,5^\circ \\ \alpha &= 2 \cdot \varphi = 135^\circ\end{aligned}$$



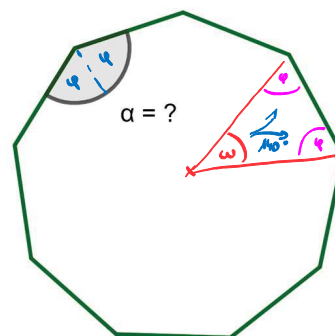
3) Vypočítejte úhel alfa v pravidelném deseti-úhelníku.

$$\begin{aligned}\omega &= 360 : 10 = 36^\circ \\ 180^\circ - 36^\circ &= 144^\circ \\ \alpha &= 2 \cdot \varphi = 144^\circ\end{aligned}$$



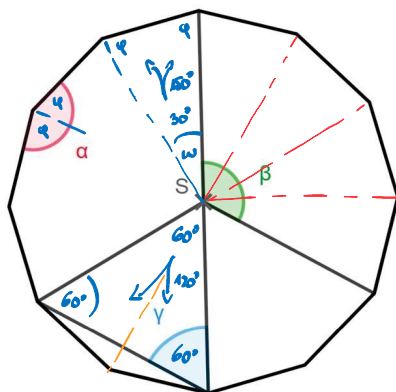
4) Vypočítejte úhel alfa v pravidelném devíti-úhelníku.

$$\begin{aligned}\omega &= 360 : 9 = 40^\circ \\ \alpha &= 2 \cdot \varphi = 140^\circ\end{aligned}$$



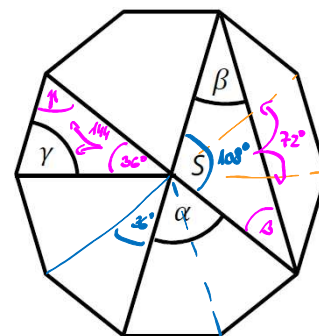
5) Vypočítejte úhly alpha, beta, gamma v pravidelném dvanácti-úhelníku.

$$\begin{aligned}\omega &= 360 : 12 = 30^\circ \\ \beta &= 4 \cdot 30^\circ = 120^\circ \\ \beta &= 120^\circ \\ \gamma &= 60^\circ \\ \alpha &= 2 \cdot \varphi = 150^\circ \\ \alpha &= 150^\circ\end{aligned}$$



6) Vypočítejte úhly alpha, beta, gamma v pravidelném deseti-úhelníku. (cermat 2018)

$$\begin{aligned}360 : 10 &= 36^\circ \\ \alpha &= 2 \cdot 36^\circ = 72^\circ \\ \alpha &= 72^\circ \\ \beta &= 144 : 2 = 72^\circ \\ \beta &= 72^\circ \\ \beta &= 72 : 2 = 36^\circ \\ \beta &= 36^\circ\end{aligned}$$

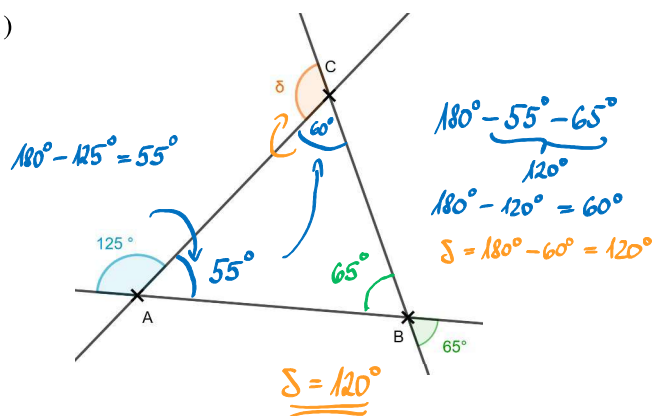


$$3 \cdot 36 = 108^\circ$$

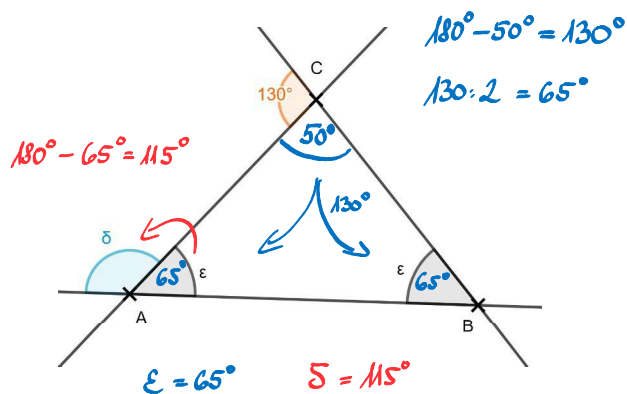
Procvičování 1

Vypočítej označené úhly.

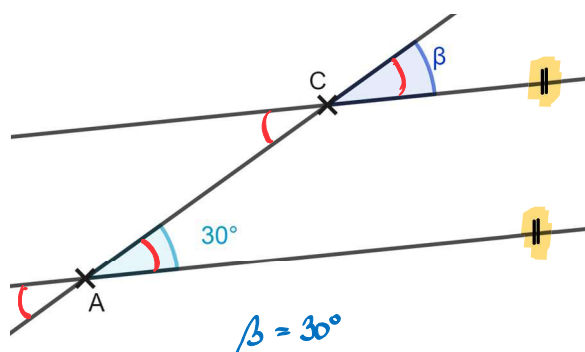
1)



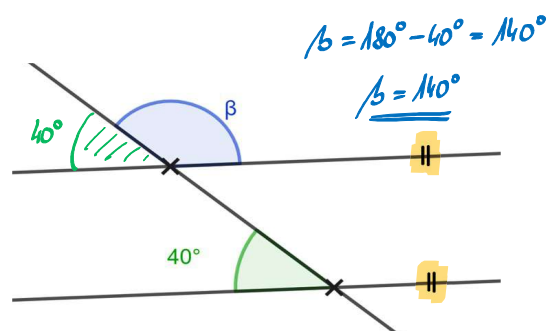
2)



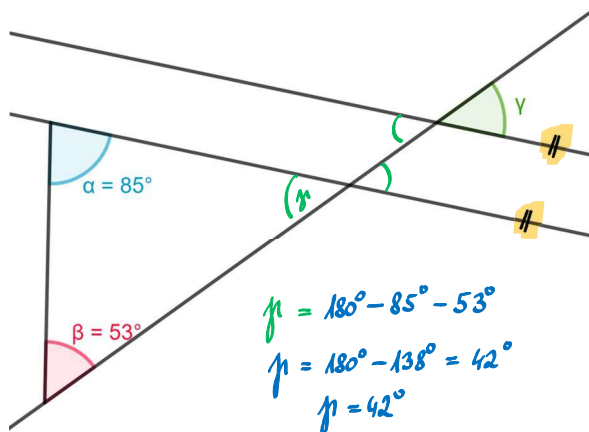
3)



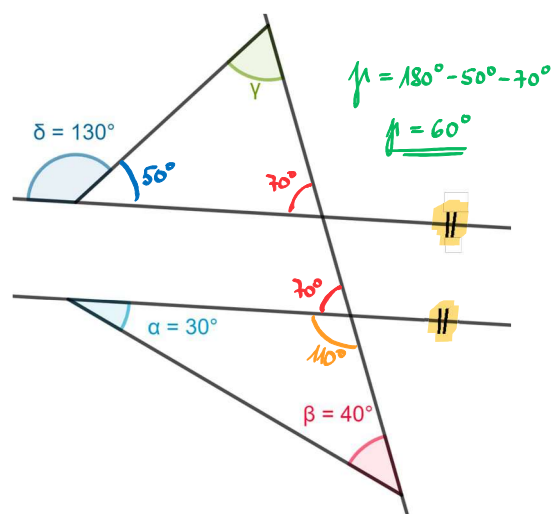
4)



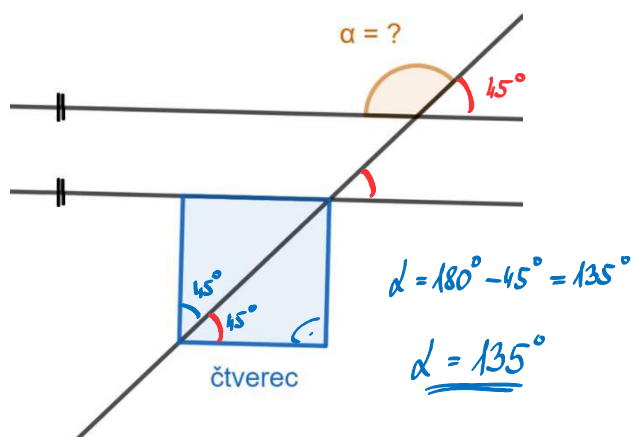
5)



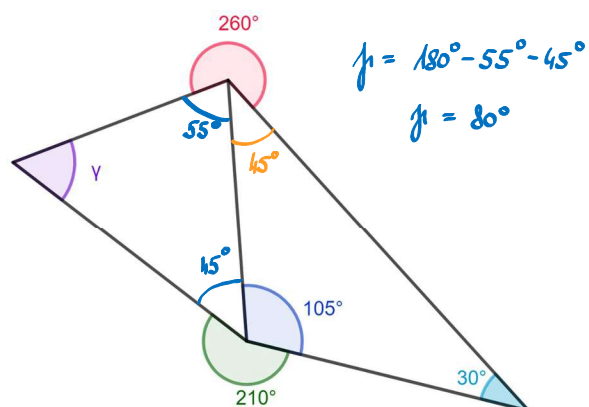
6)



7)



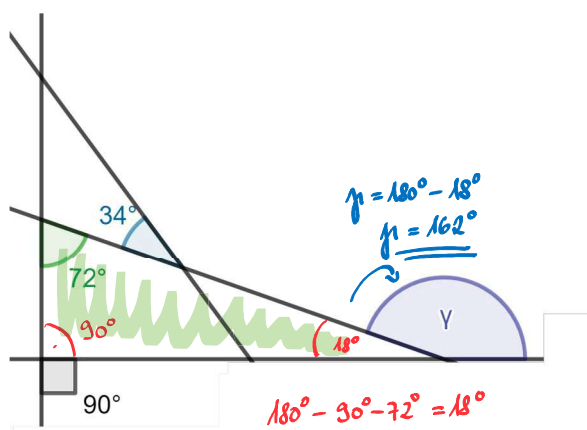
8)



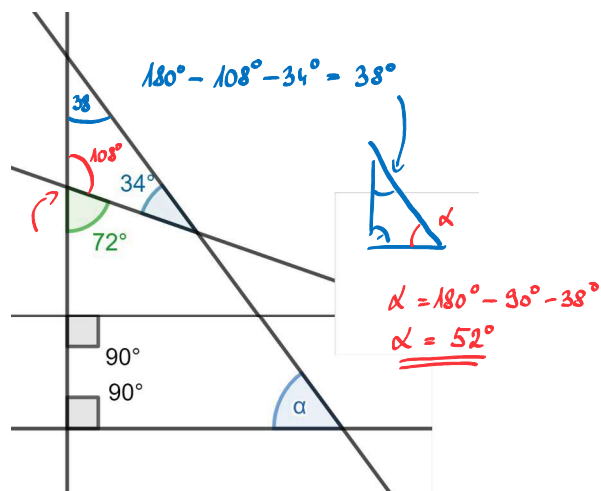
Procvičování 2

Dopočítej chybějící úhly.

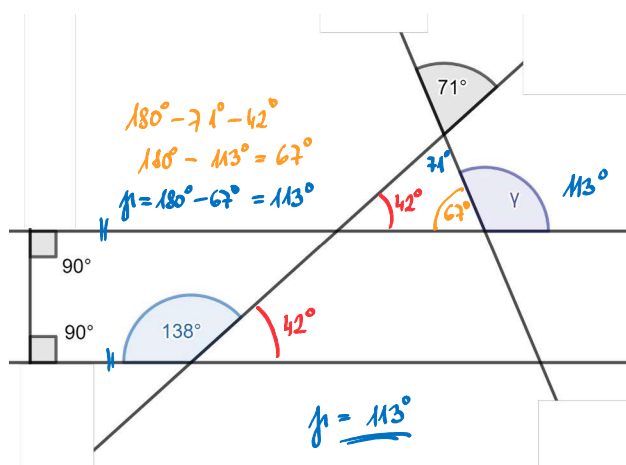
1)



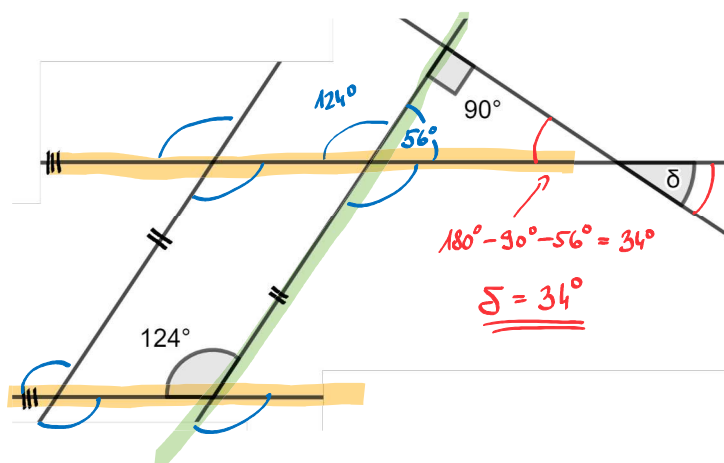
2)



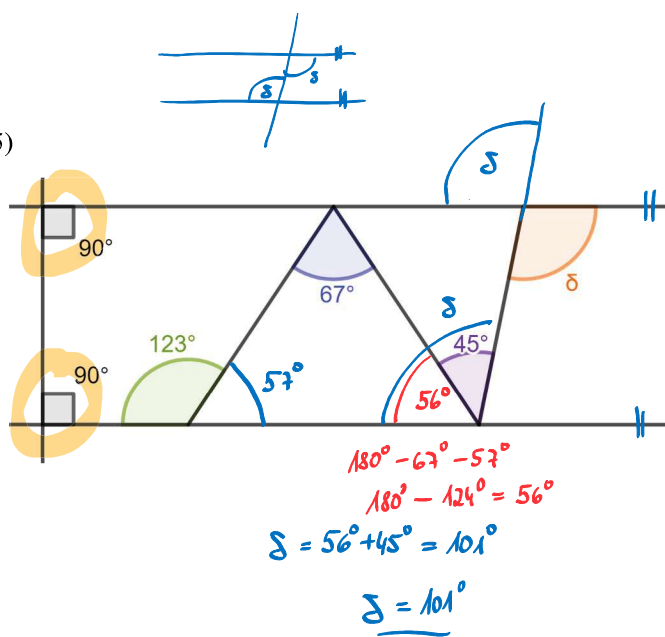
3)



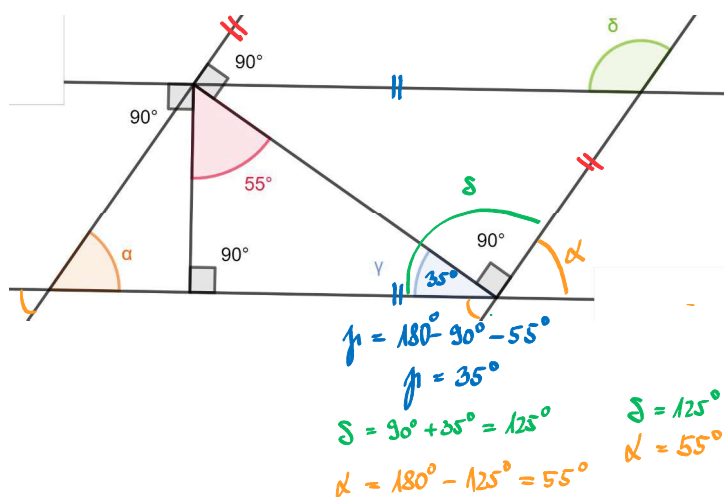
4)



5)



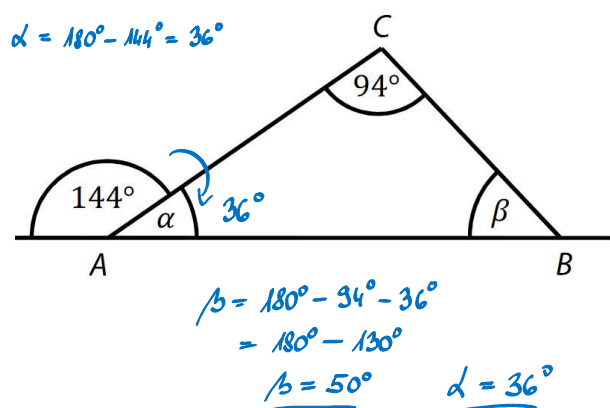
6)



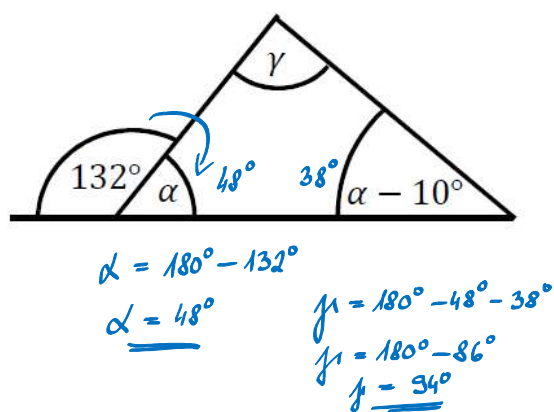
Procvičování 3

Dopočítej chybějící úhly.

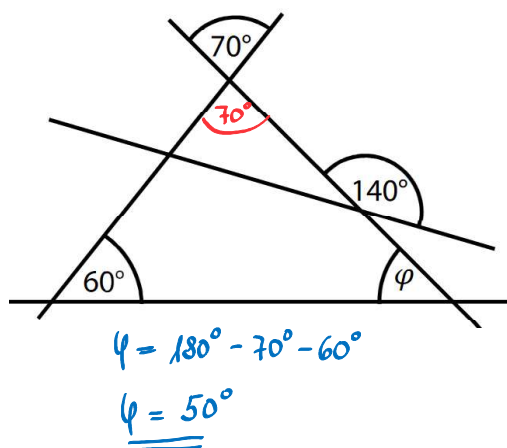
1)



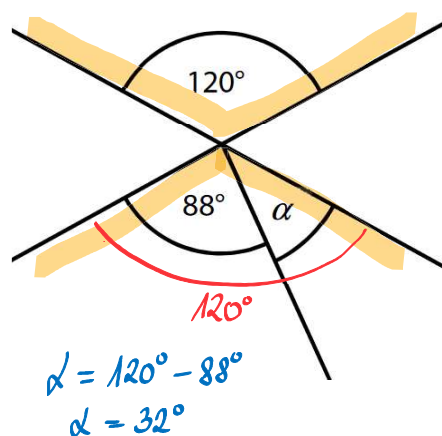
2)



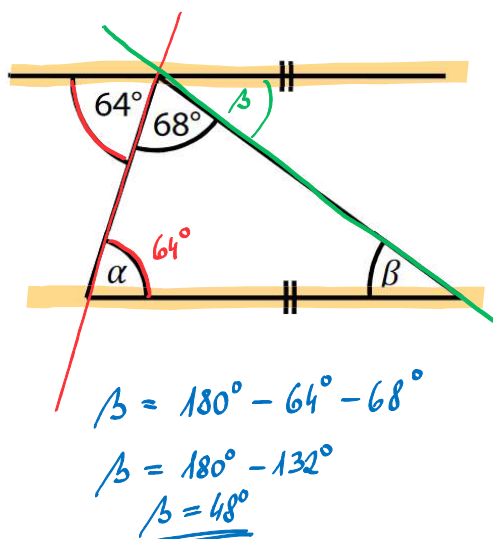
3)



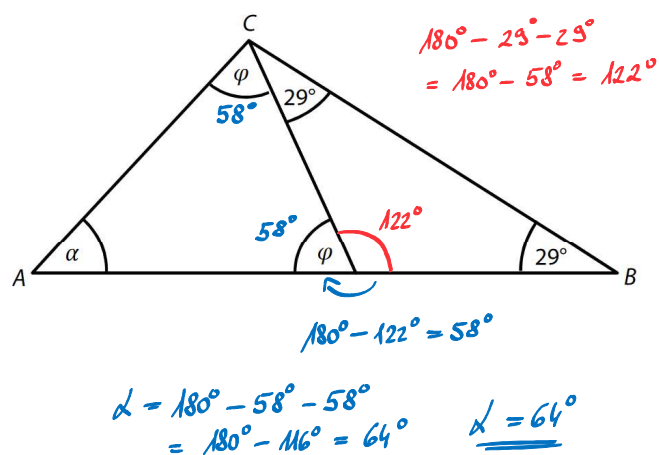
4)



5)



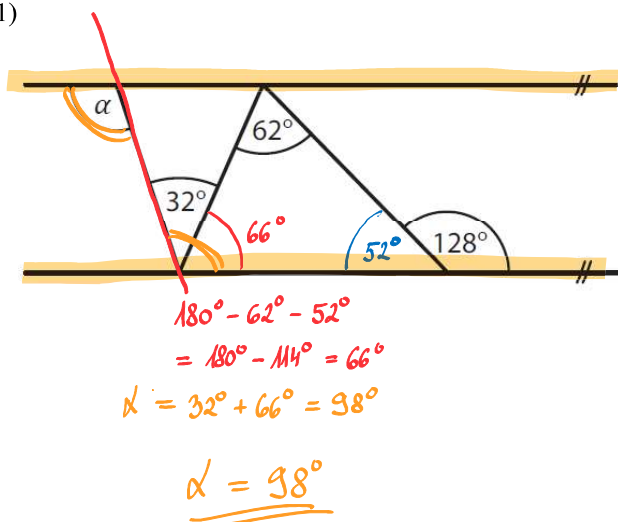
6)



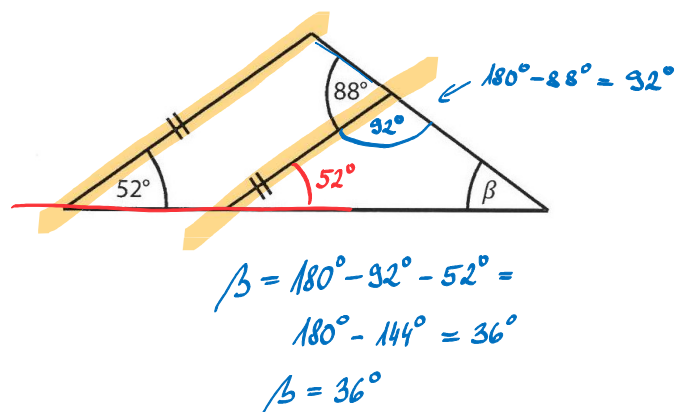
Procvičování 4

Dopočítej chybějící úhly.

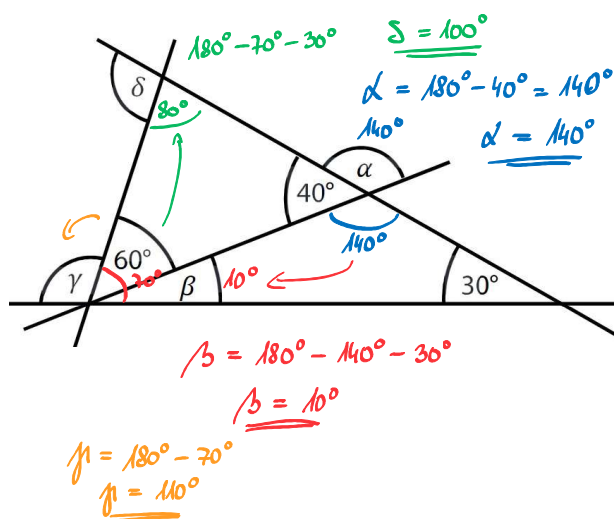
1)



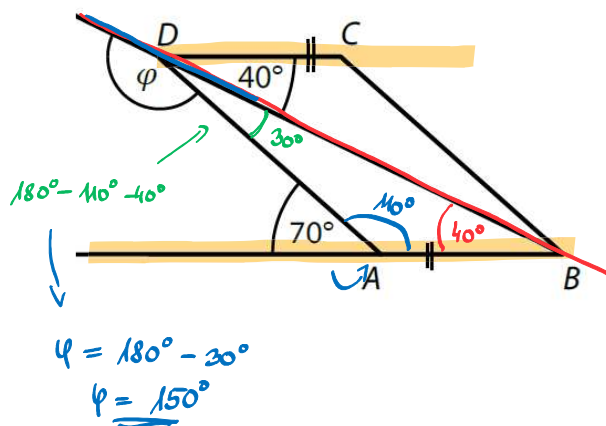
2)



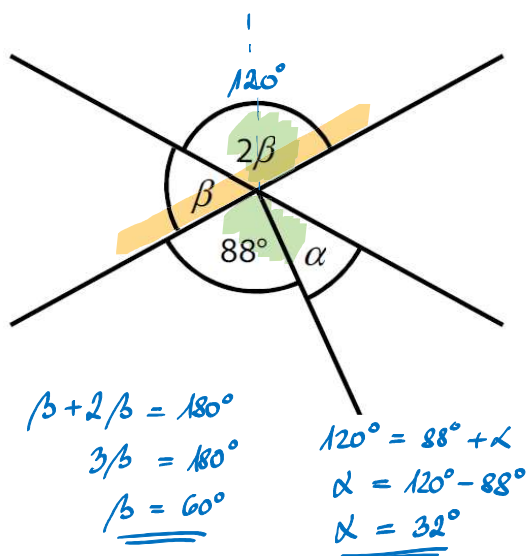
3)



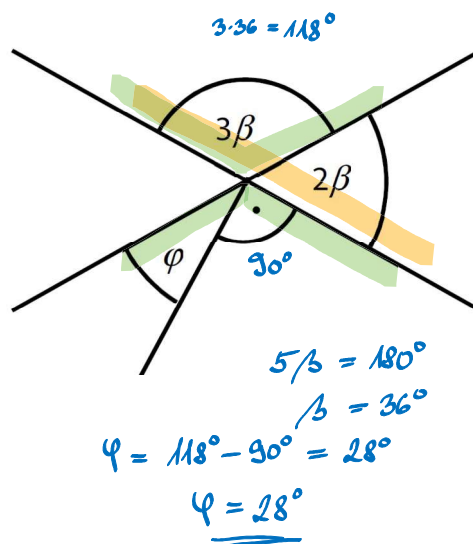
4)



5)



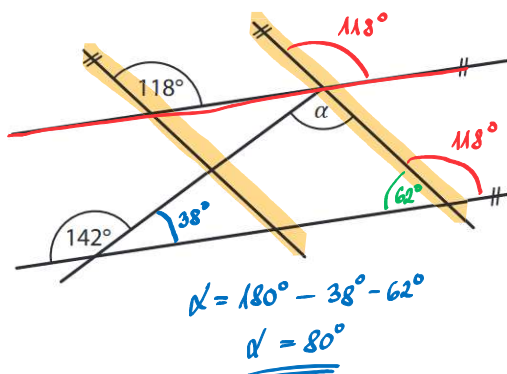
6)



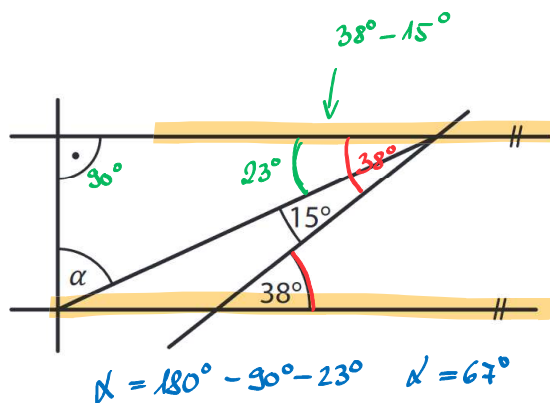
Procvičování 5

Dopočítej chybějící úhly.

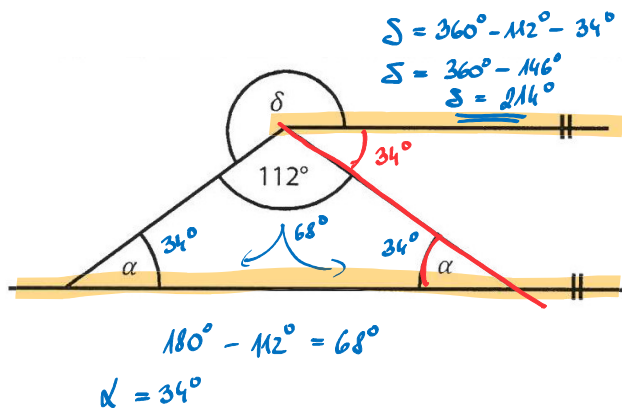
1)



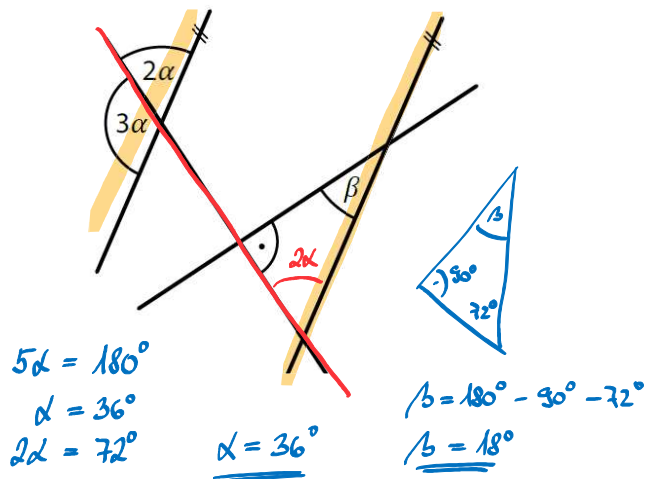
2)



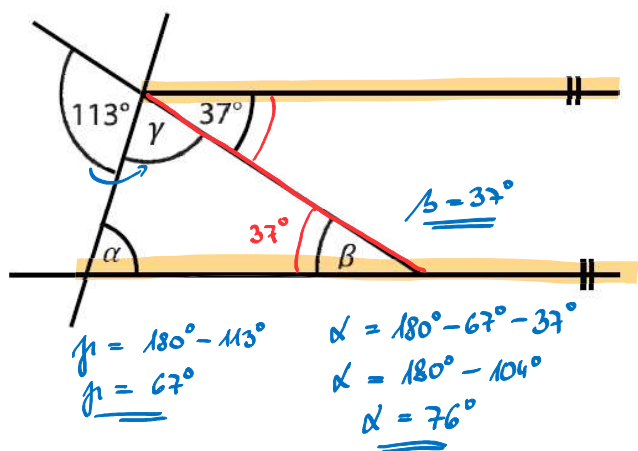
3)



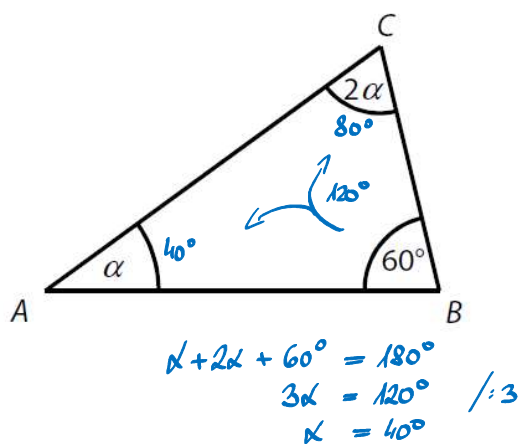
4)



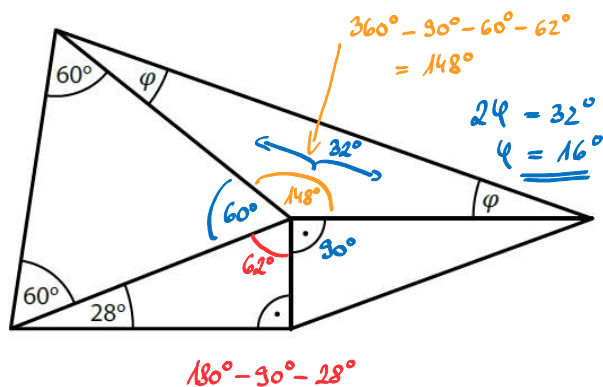
5)



6)



7)



8)

