VAJA 3

KOORDINATNI RAČUN, SLEPI POLIGON

GEODETSKI RAČUNI

VSEBINA

- Koordinatni sistemi v ravnini
- Izračun dolžine in smernega kota
- Izračun koordinat nove točke
- Slepi poligon

DRŽAVNI RAVNINSKI KOORDINATNI SISTEM

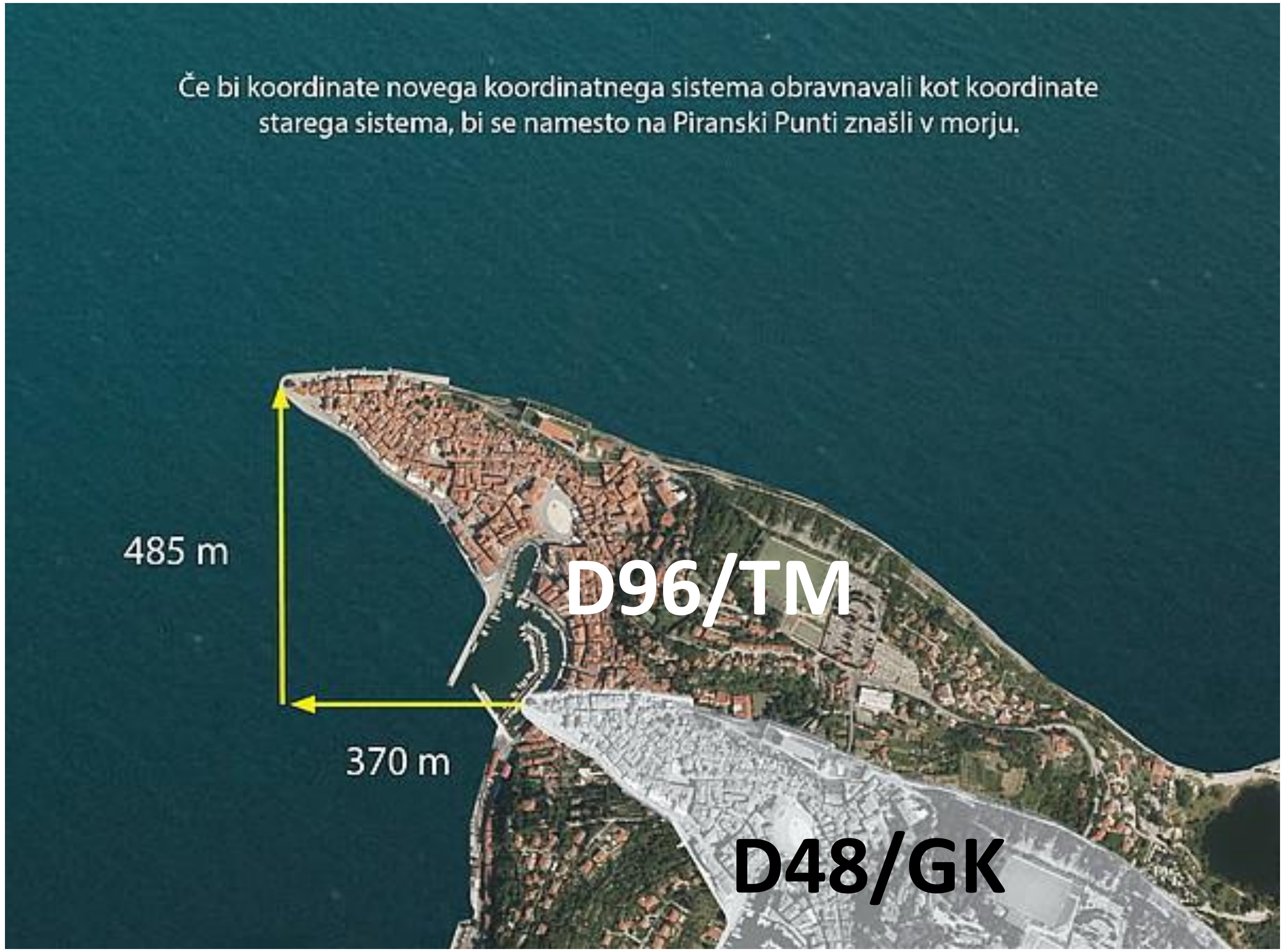
D96/TM

- vzpostavljen 2008
- osnova: pasivne in aktivne GNSS-mreže
- elipsoid: GSR 80
- projekcija: transverzalna (prečna) Mercatorjeva projekcija
- koordinate: (e, n)
- trenutno aktualen državni horizontalni koordinatni sistem

D48/GK

- vzpostavljen 1948
- osnova: astrogeodetska mreža
- elipsoid: Bessel
- projekcija: Gauss–Krügerjeva projekcija
- koordinate: (y, x)
- zastarel, naj se ne bi več uporabljal, a v praksi ni tako …

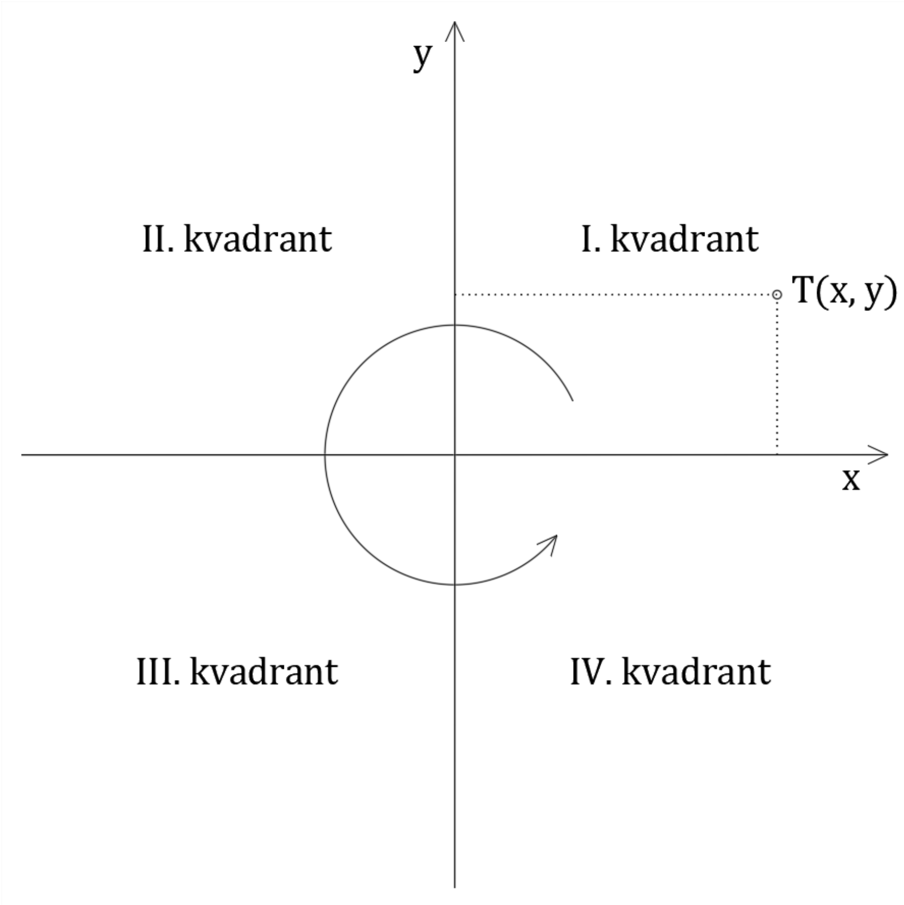
DRŽAVNI RAVNINSKI KOORDINATNI SISTEM



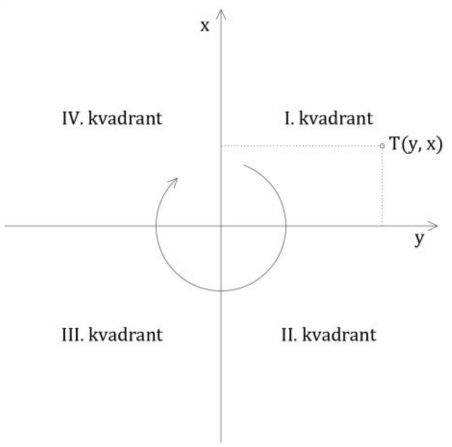
vir: https://www.e-prostor.gov.si/zbirke-prostorskih-podatkov/drzavni-prostorski-koordinatni-sistem/horizontalna-sestavina/drzavni-koordinatni-sistem-d96tm-esrs/#tab4-1596

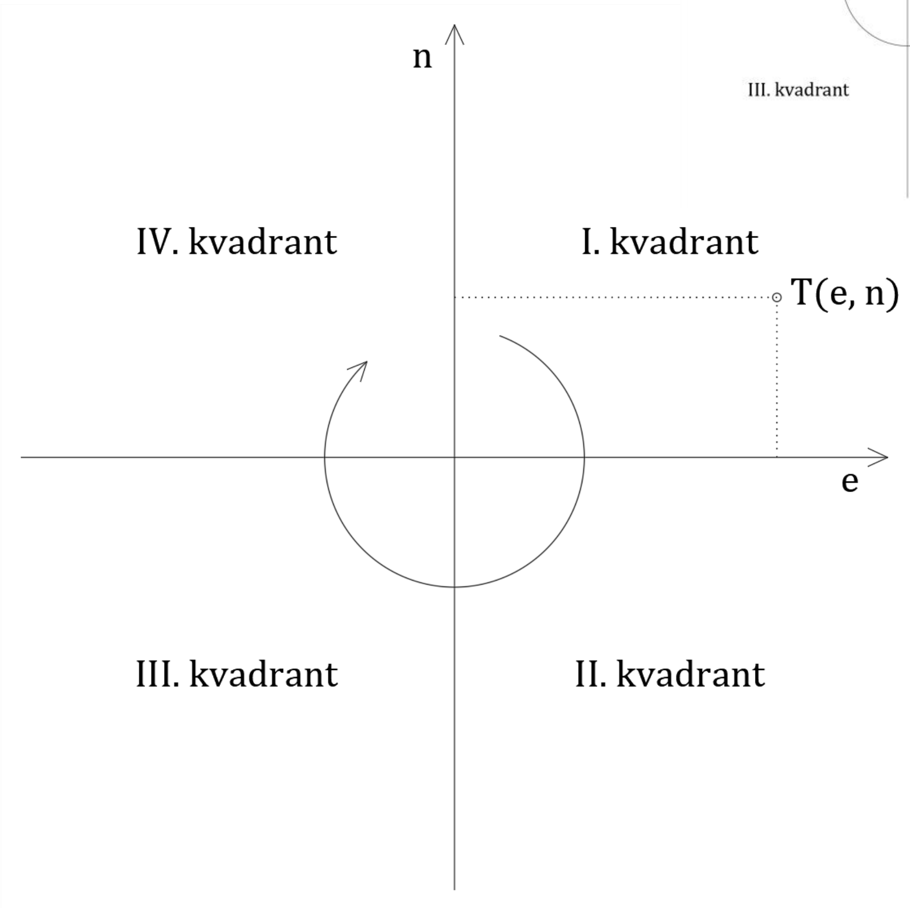
RAVNINSKI KARTEZIČNI KOORDINATNI SISTEM

MATEMATIČNI



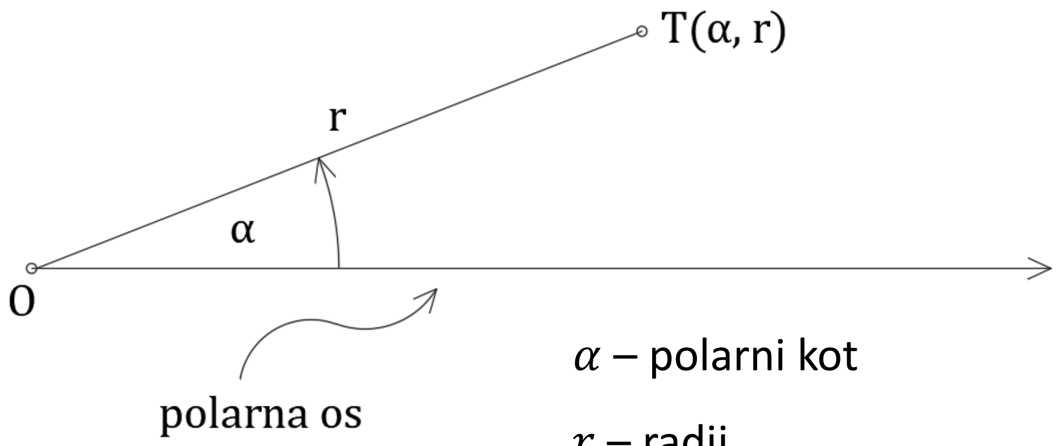
GEODETSKI





POLARNI KOORDINATNI SISTEM

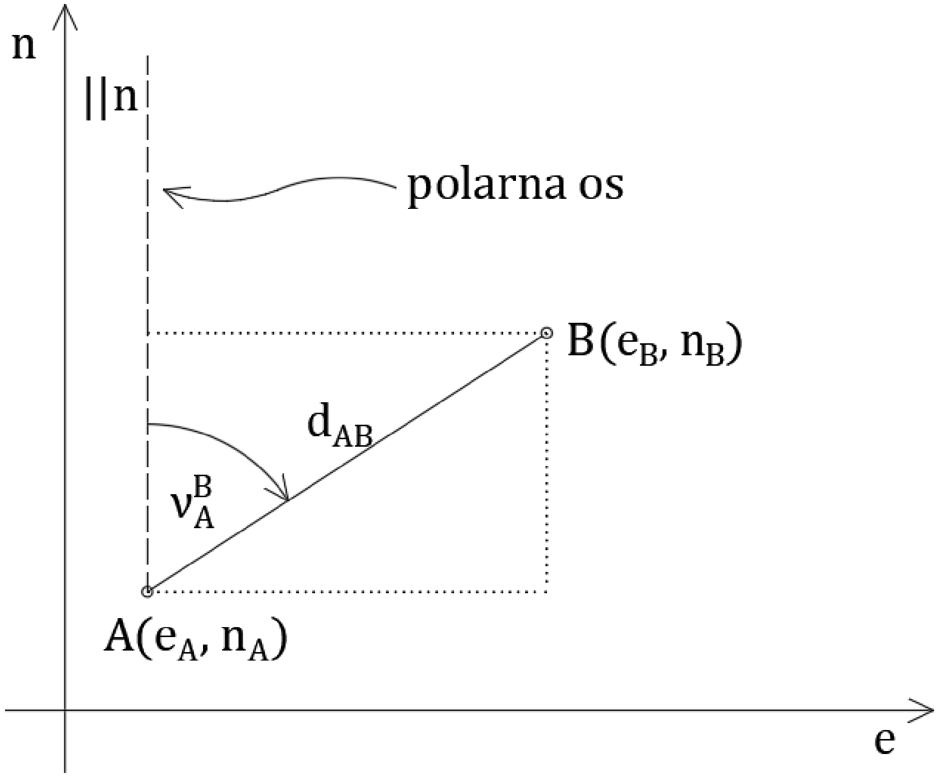
MATEMATIČNI



α – polarni kot

r – radij

GEODETSKI



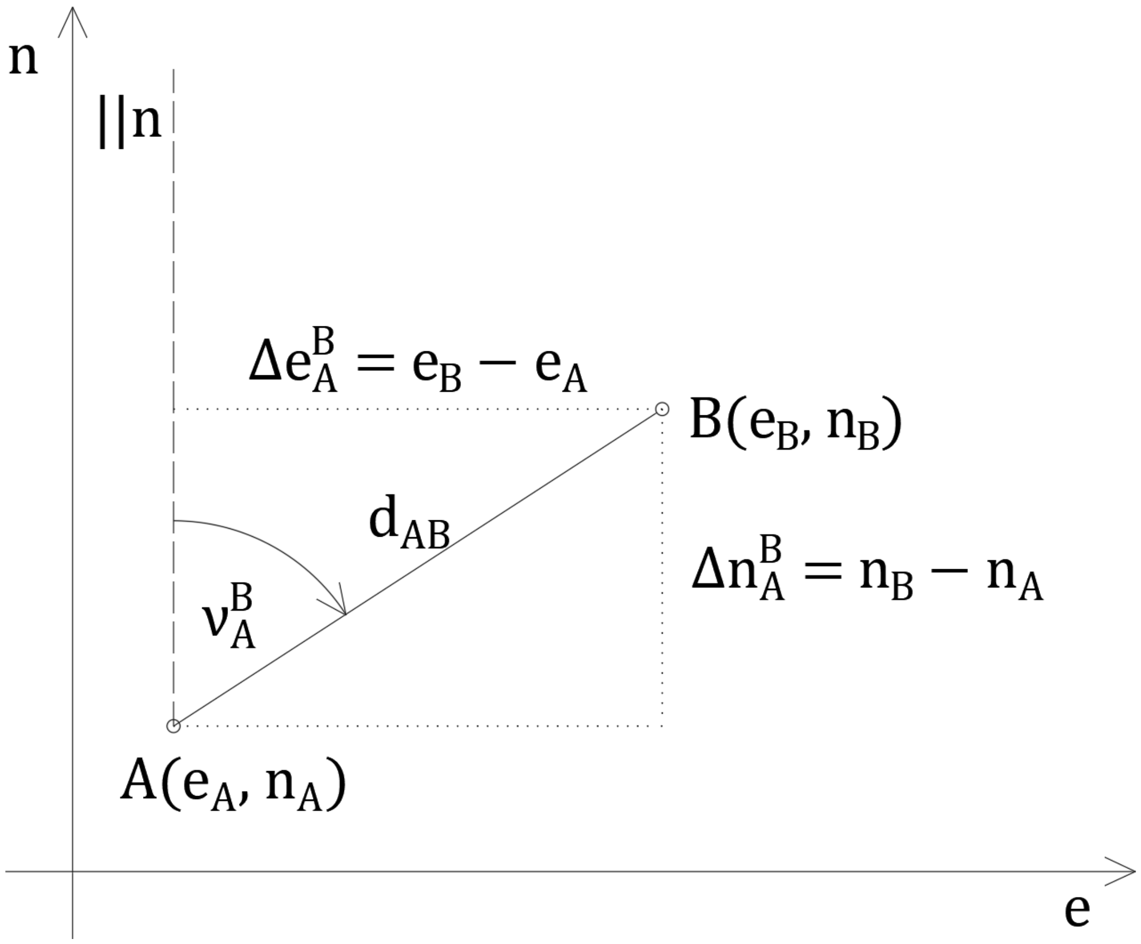
ν_A^B – smerni kot

d_{AB} – horizontalna dolžina

IZRAČUN DOLŽINE

$$d_{AB} = \sqrt{(e_B - e_A)^2 + (n_B - n_A)^2}$$

$$d_{AB} = \sqrt{(\Delta e_A^B)^2 + (\Delta n_A^B)^2}$$

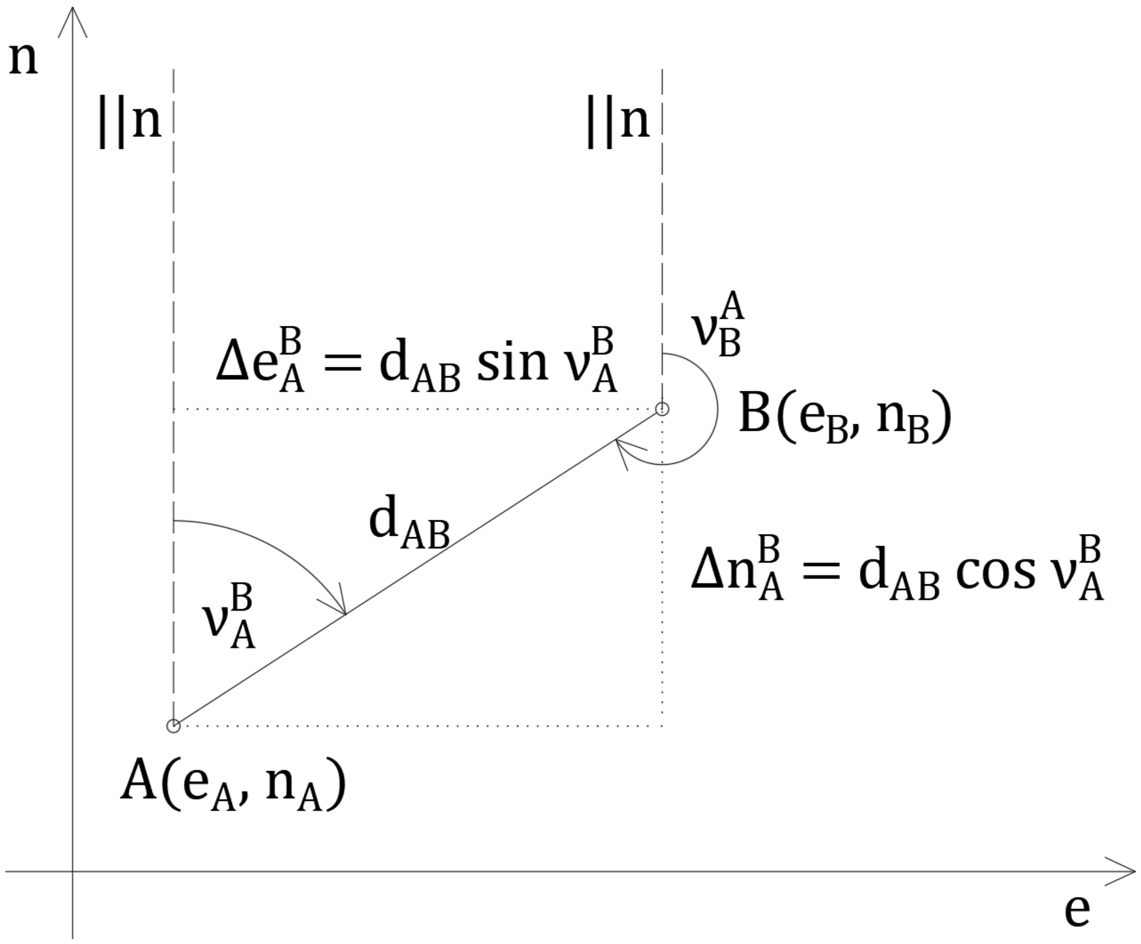


IZRAČUN SMERNEGA KOTA

$$\nu_A^B = \arctan \frac{e_B - e_A}{n_B - n_A}$$

$$\nu_A^B = \arctan \frac{\Delta e_A^B}{\Delta n_A^B}$$

$$\nu_B^A = \nu_A^B \pm 180°$$

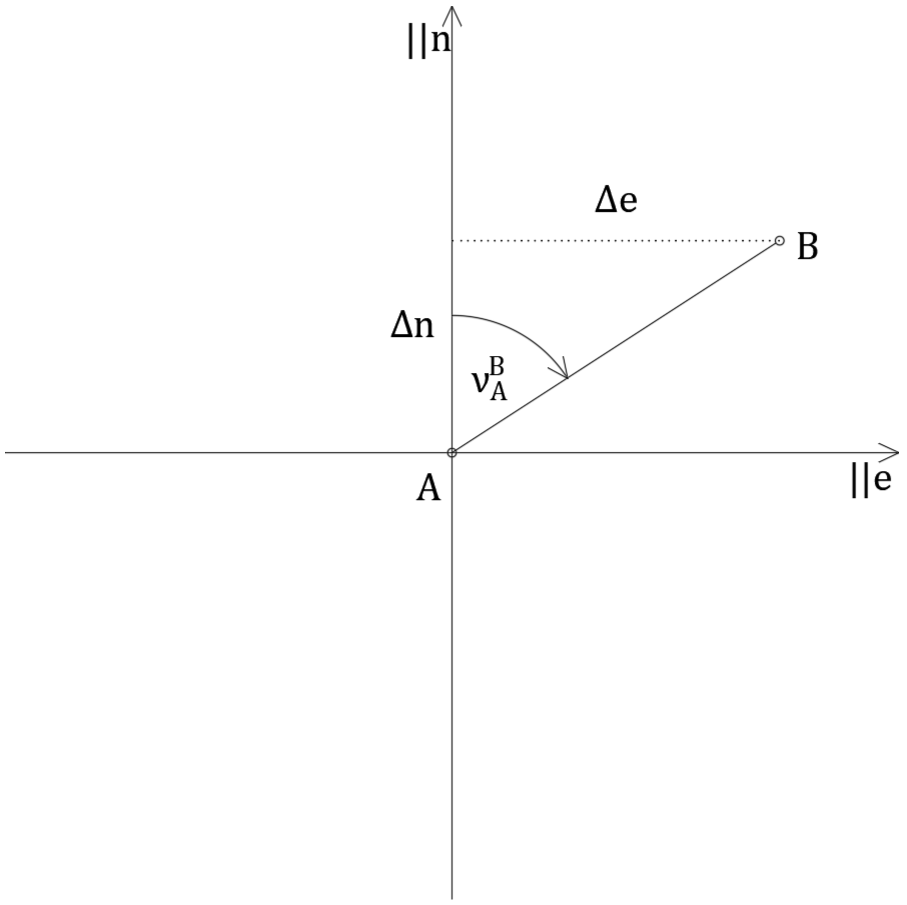


IZRAČUN SMERNEGA KOTA

	I. kvadrant	II. kvadrant	III. kvadrant	IV. kvadrant
Δe	$+$	$+$	$-$	$-$
Δn	$+$	$-$	$-$	$+$
smerni kot	ν	$\nu + 180°$	$\nu + 180°$	$\nu + 360°$

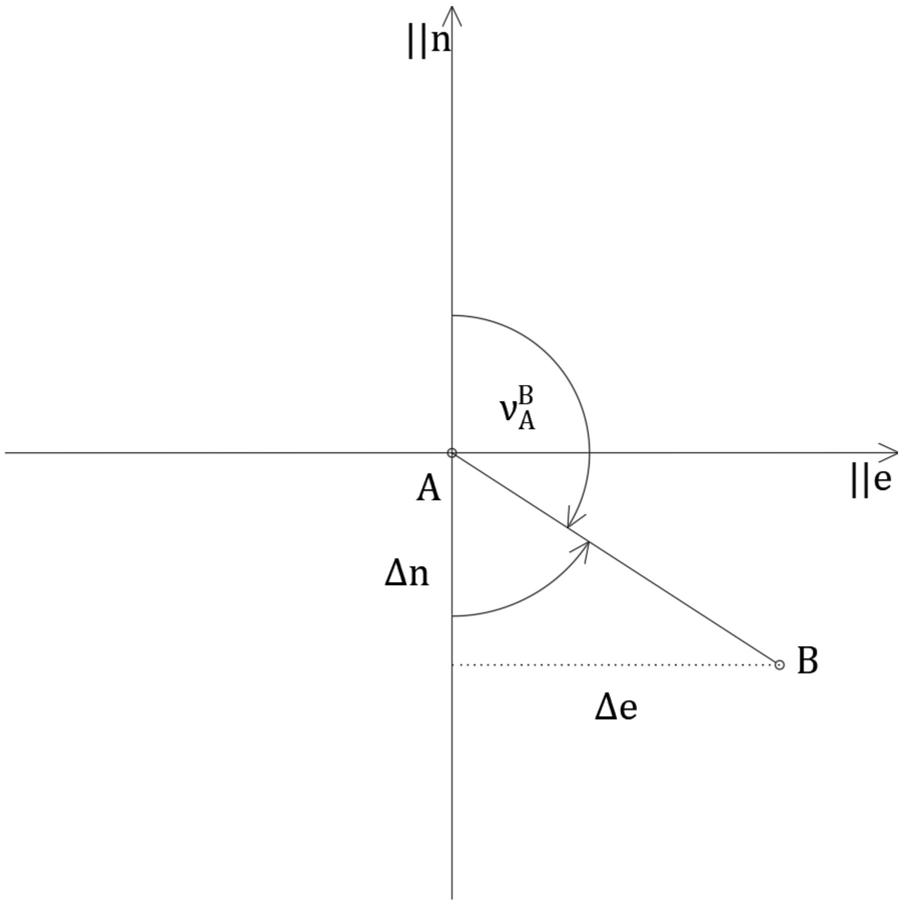
IZRAČUN SMERNEGA KOTA

	I. kvadrant
Δe	$+$
Δn	$+$
smerni kot	ν



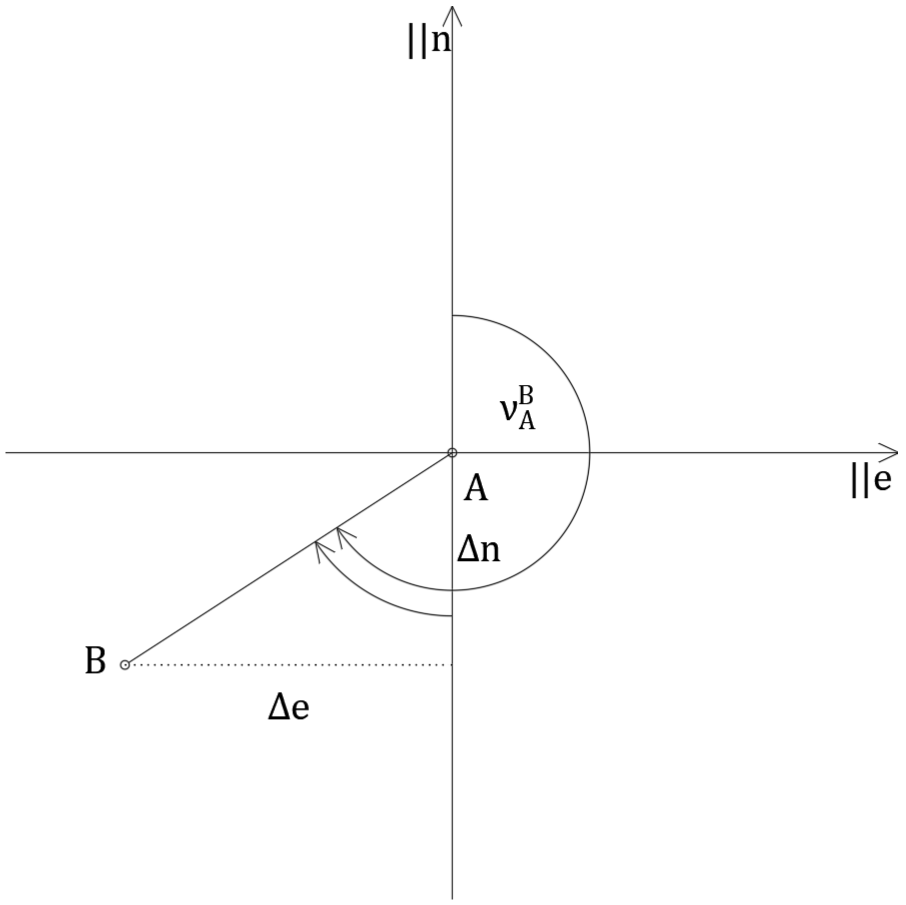
IZRAČUN SMERNEGA KOTA

	II. kvadrant
Δe	$+$
Δn	$-$
smerni kot	$\nu + 180°$



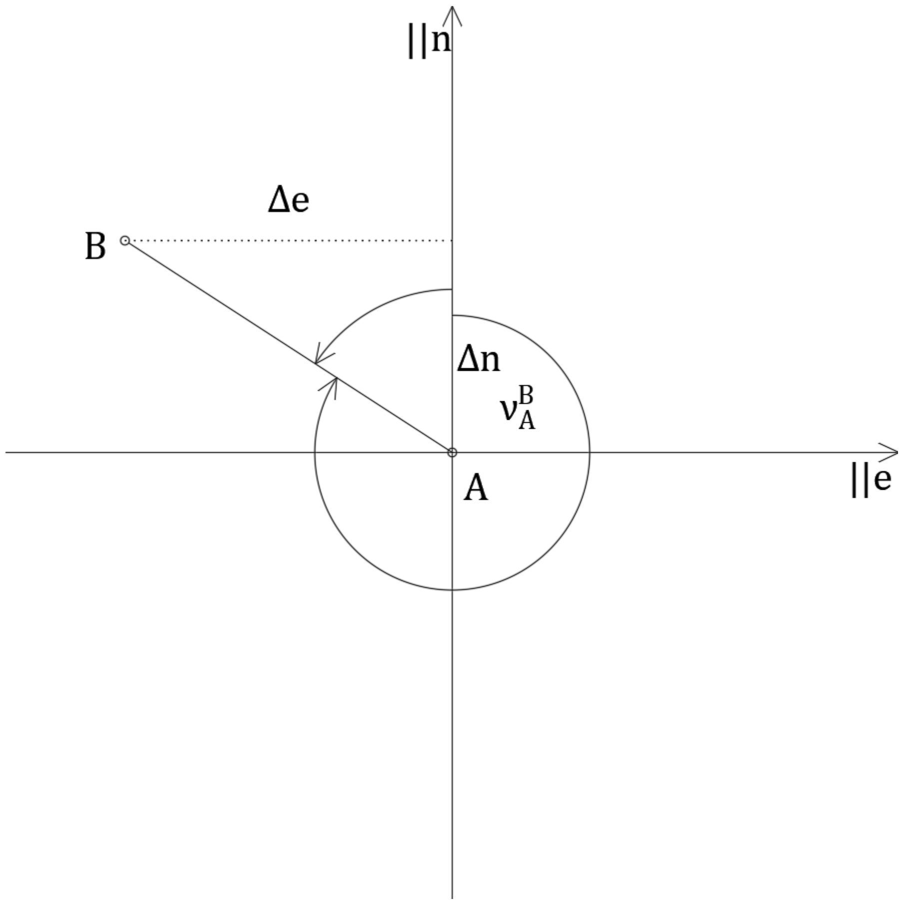
IZRAČUN SMERNEGA KOTA

	III. kvadrant
Δe	$-$
Δn	$-$
smerni kot	$\nu + 180°$



IZRAČUN SMERNEGA KOTA

	IV. kvadrant
Δe	$-$
Δn	$+$
smerni kot	$\nu + 360°$



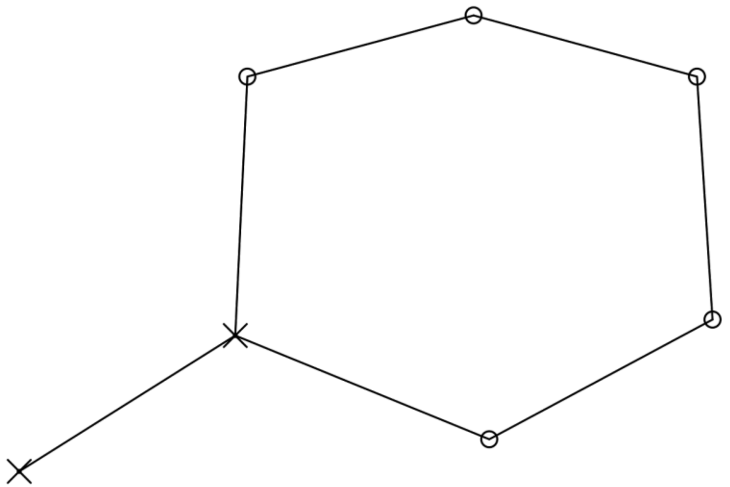
IZRAČUN SMERNEGA KOTA

ROBNI PRIMERI

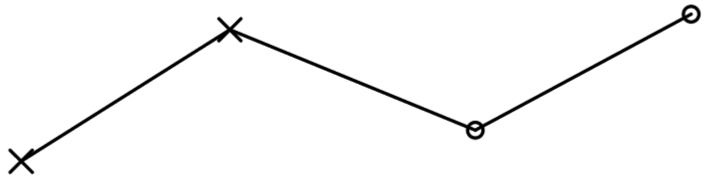
- $\Delta e = 0, \;\; \Delta n > 0 \;\rightarrow\; \nu_A^B = 0°$
- $\Delta e > 0, \;\; \Delta n = 0 \;\rightarrow\; \nu_A^B = 90°$
- $\Delta e = 0, \;\; \Delta n < 0 \;\rightarrow\; \nu_A^B = 180°$
- $\Delta e < 0, \;\; \Delta n = 0 \;\rightarrow\; \nu_A^B = 270°$
- $\Delta e = 0, \;\; \Delta n = 0 \;\rightarrow\; \nu_A^B = ne\ obstaja \rightarrow A = B$

! PAZI PRI PROGRAMIRANJU !

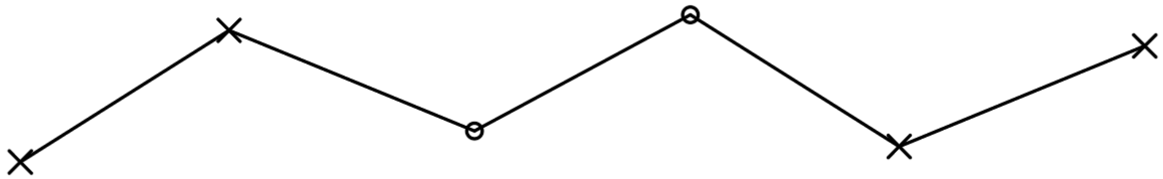
POLIGON



zaključeni poligon



slepi poligon



priklepni poligon

X – dana točka
o – nova točka

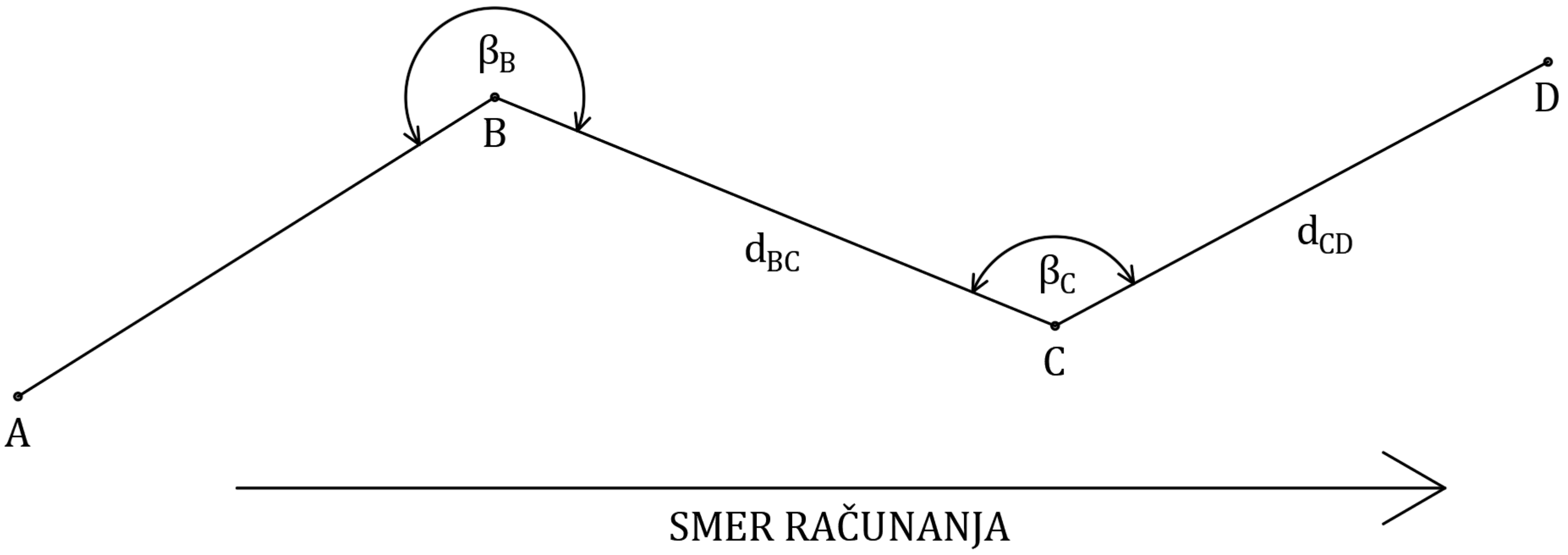
SLEPI POLIGON

<u>dano</u>: $A(e_A, n_A), B(e_B, n_B), \beta_B, d_{BC}, \beta_C, d_{BD}$

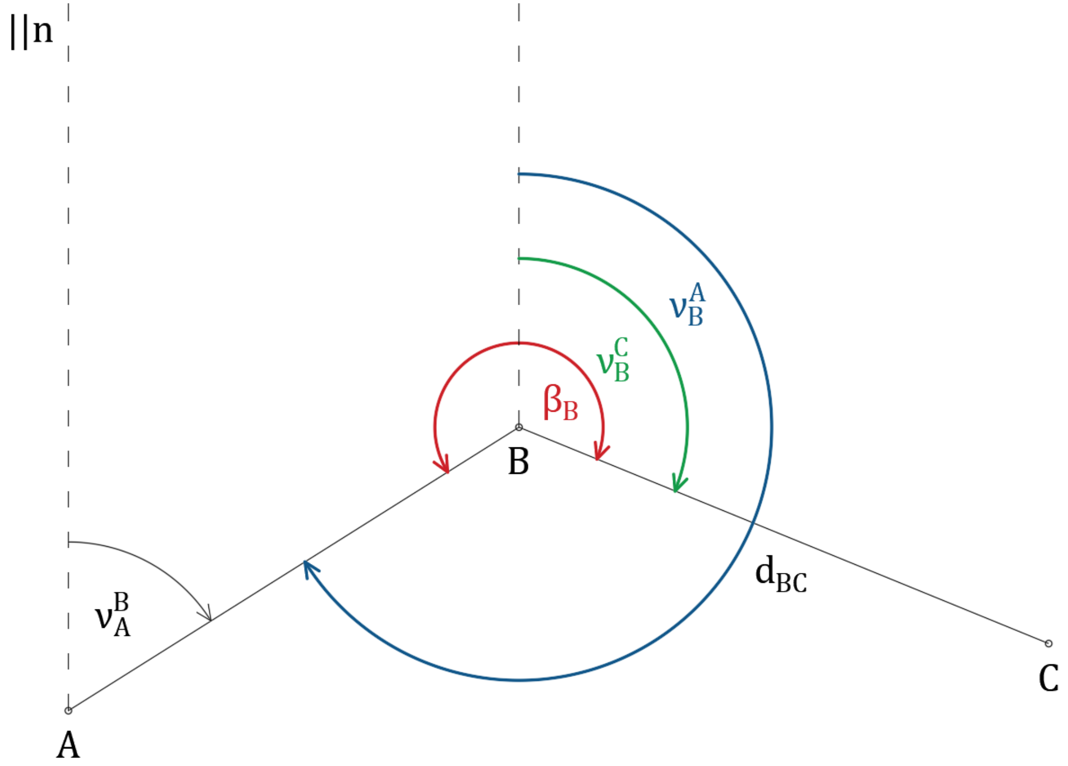
<u>iščemo</u>: $C(e_C, n_C), D(e_D, n_D)$

β_i – lomni koti

<u>Lomni koti so, glede na smer računanja, vedno na levi strani poligona.</u>



SLEPI POLIGON



$$\nu_B^C = \beta_B - \left(360° - \nu_B^A\right)$$

$$\nu_B^C = \beta_B - \left(360° - (\nu_A^B + 180°)\right)$$

$$\nu_B^C = \nu_A^B + \beta_B - 180°$$

če $\nu_B^C < 0° \rightarrow \nu_B^C = \nu_B^C + 360°$

$$e_C = e_B + d_{BC} \sin \nu_B^C$$

$$n_C = n_B + d_{BC} \cos \nu_B^C$$

KONTROLA: Izračunaj $\boldsymbol{\nu_B^C}$ iz dobljenih koordinat in primerjaj z vhodnim $\boldsymbol{\nu_B^C = \nu_A^B + \beta_B - 180°}$