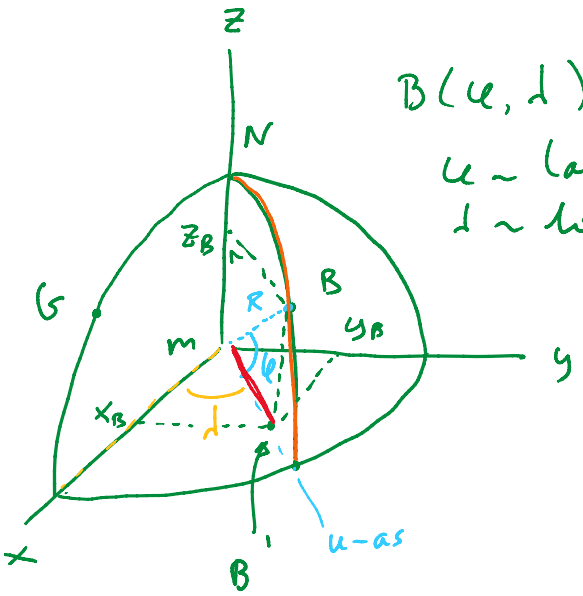
TW3_MTK_Week1_Les2

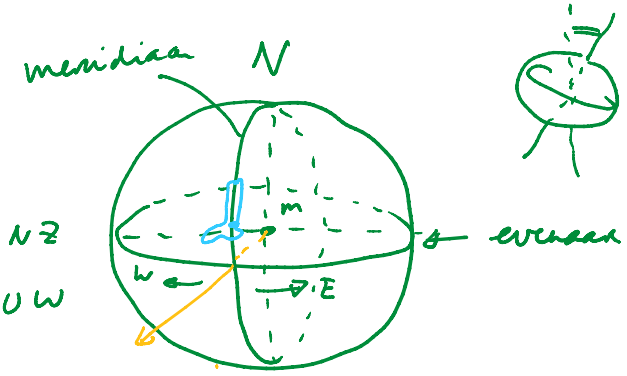
Tuesday, November 10, 2020 9:46 AM



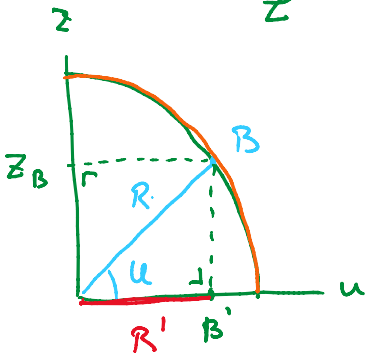
B(u, l)

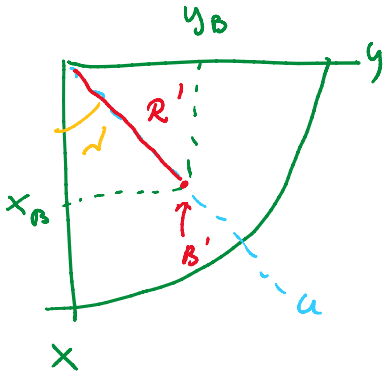
u ~ latitude NZ

l ~ longitude OW



Z





$$\begin{cases} x = R\cos u.\cos l \\ y = R\cos u.\sin l \\ z = R.\sin u \end{cases}$$

$$\sin u = \frac{BB'}{R} = \frac{z_B}{R} \Leftrightarrow z_B = R.\sin u$$

$$R' = R.\cos u$$

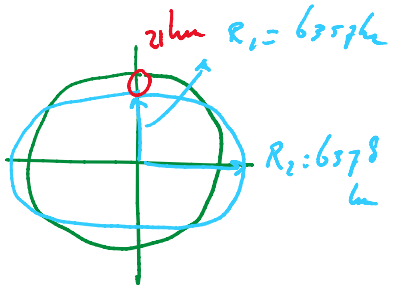
$$x_B = R'.\cos l = R.\cos u.\cos l$$

$$y_B = R'.\sin l = R.\cos u.\sin l$$

Berlijn: 52° 31' 12,0" N ⇒ 52,52° [A] → u

013° 24' 17,8" O ⇒ 13,405° [B] → l (oost +)

R = 6378 km



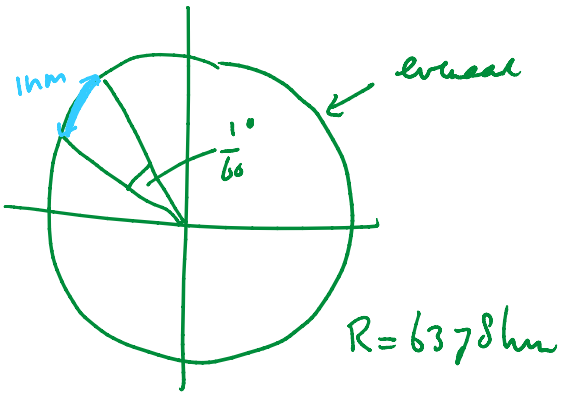
$$\begin{cases} x = R.\cos u.\cos l = 3775,2 \ [x] \\ y = R\cos u.\sin l = 899,7 \ [y] \\ z = R.\sin u = 5061,4 \ [z] \end{cases}$$

eenheid op aarde: nautische mijl.

omtrek = $2.\pi.R = 2.\pi.6378$

$360° \rightarrow 360°.60'$

$$\frac{2\pi.6378}{360.60} = 1,852 \text{ km}$$



$1^\circ = \underline{60\ nm} = 111{,}12\ km$

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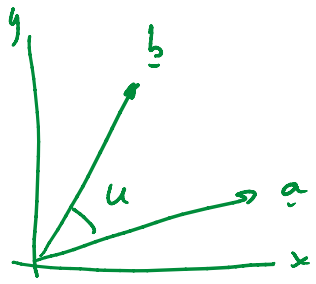
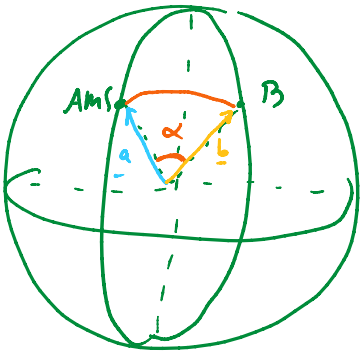
afstanden m.b.v. inwendig product



$$(\underline{a}.\underline{b}) = |\underline{a}|.|\underline{b}|.\cos u$$

$$\cos u = \frac{(\underline{a}.\underline{b})}{|\underline{a}|.|\underline{b}|}$$

$$\underline{a} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$$



α → afstand
× 60 nm
× 1,852 m

AMS $52^\circ\ 22'\ 12{,}78''$ → $52{,}37^\circ N$ [c]

$004^\circ\ 53'\ 42{,}6''$ → $4{,}895^\circ O$ [D]

$x = R.\cos u.\cos l = 3879{,}9$ [u]

$y = R.\cos u.\sin l = 332{,}3$ [v]

$z = R.\sin u = 505{,}12$ [w]

$$\cos u = \frac{(\underline{a}.\underline{b})}{|\underline{a}|.|\underline{b}|} = \frac{(\underline{a}.\underline{b})}{R^2} = \frac{4051236261}{R^2}$$

($|\underline{a}| \nearrow R$, $|\underline{b}| \nwarrow R$)

$= 0{,}9959\ldots$ [o] → $u = 5{,}18^\circ$

311,16 nm

576,3 km