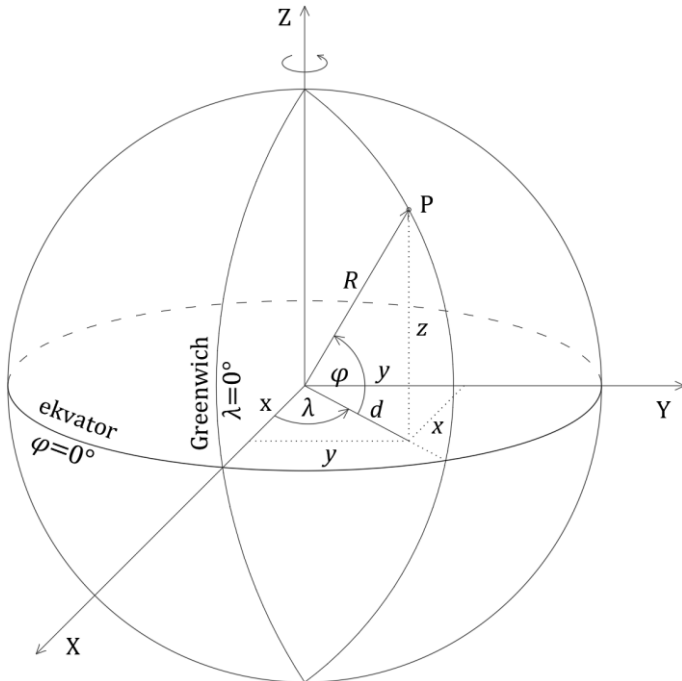


**VAJA 8 – PROSTORSKI KOORDINATNI SISTEMI**

- 1**  $(\varphi, \lambda, R) \rightarrow (x, y, z)$ : **PRETVORBA IZ GEOGRAFSKIH (KROGELNIH) KOORDINAT V KARTEZIČNE KOORDINATE**

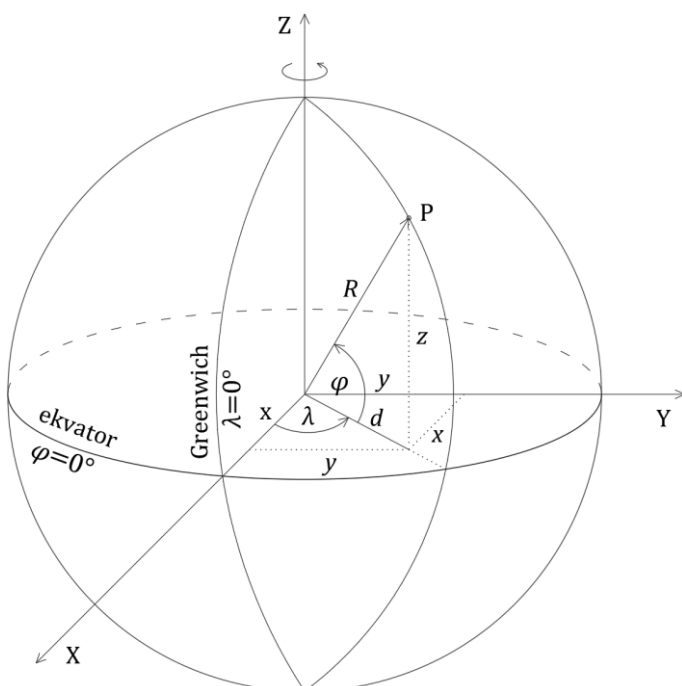


$$x = R \cos \varphi \cos \lambda$$

$$y = R \cos \varphi \sin \lambda$$

$$z = R \sin \varphi$$

- 2**  $(x, y, z) \rightarrow (\varphi, \lambda, R)$ : **PRETVORBA KARTEZIČNIH KOORDINAT V GEOGRAFSKE (KROGELNE) KOORDINATE**



$$R = \sqrt{x^2 + y^2 + z^2}$$

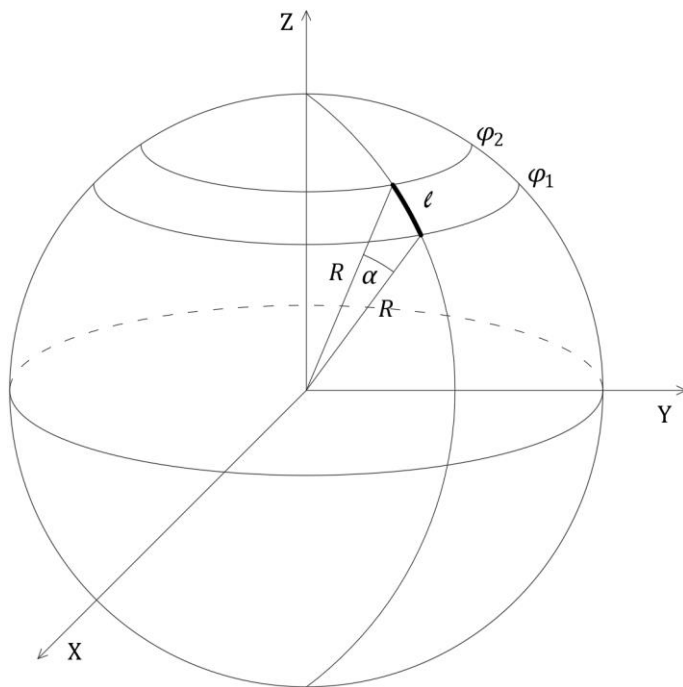
$$\varphi = \arcsin \frac{z}{R} \in [-90^\circ, 90^\circ]$$

$$\lambda = \arctan \frac{y}{x} \in (-180^\circ, 180^\circ]$$

Če  $x < 0$ :

- če  $y \geq 0$ :  $\lambda = \lambda + 180^\circ$ ,
- če  $y < 0$ :  $\lambda = \lambda - 180^\circ$ .

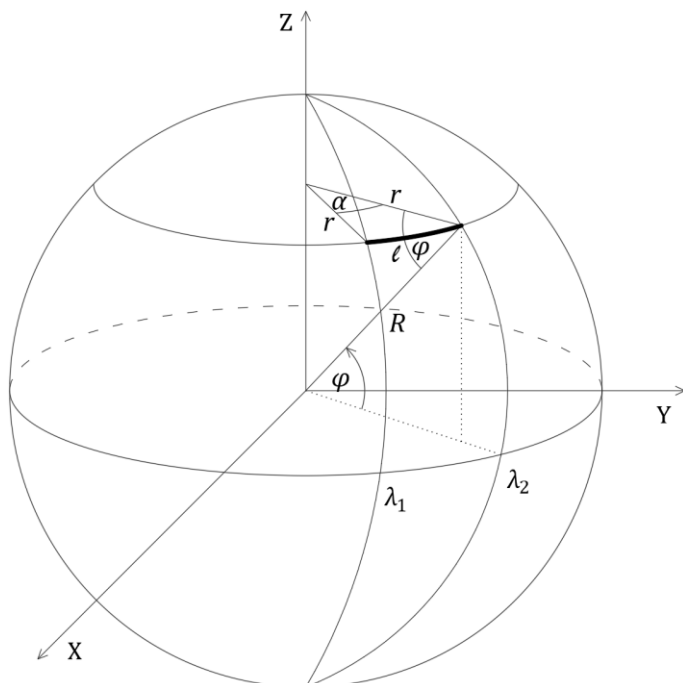
### 3 DOLŽINA LOKA POLDNEVNIKA (MERIDIANA) NA ZEMLJI-KROGLI



$$\alpha = \Delta\varphi = |\varphi_2 - \varphi_1|$$

$$l = R \alpha [^\circ] \frac{\pi}{180^\circ} = R \alpha [\text{rad}]$$

### 4 DOLŽINA LOKA VZPOREDNIKA NA ZEMLJI-KROGLI



$$\alpha = \Delta\lambda = |\lambda_2 - \lambda_1|$$

Če  $\alpha > 180^\circ \rightarrow \alpha = 360 - \alpha$ .

$$r = R \cos \varphi$$

$$l = r \alpha [^\circ] \frac{\pi}{180^\circ} = r \alpha [\text{rad}]$$