

# Latitude and Polaris

The direction of light from a distant source can be represented by parallel rays.

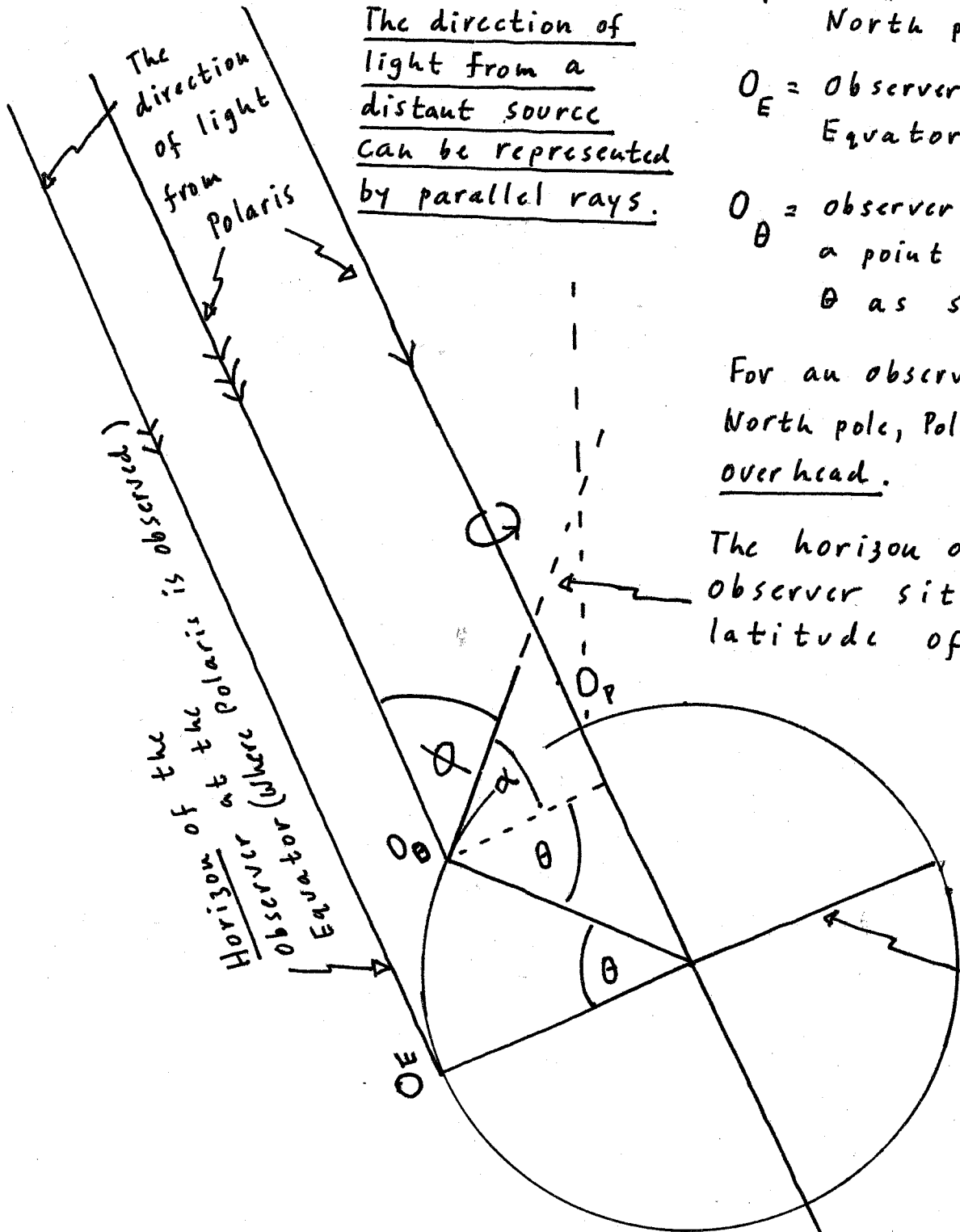
$O_p$  = observer at the North pole.

$O_E$  = Observer at the Equator

$O_\theta$  = observer situated at a point of latitude  $\theta$  as shown.

For an observer at the North pole, Polaris is (almost) overhead.

The horizon of the observer situated at a latitude of  $\theta$



Represents the Equator of the Earth

23.5° from the vertical: the axis of the rotation of the Earth

$\phi$  (Phi) is the angular height of Polaris above the horizon of the observer at a latitude of  $\theta$ .

Now,  $\theta + \alpha = 90^\circ$   
 And  $\phi + \alpha = 90^\circ$   
 $\Rightarrow \theta = \phi$

That is, the angular height of the Pole Star above the observer's horizon is equal to the latitude of the observer.