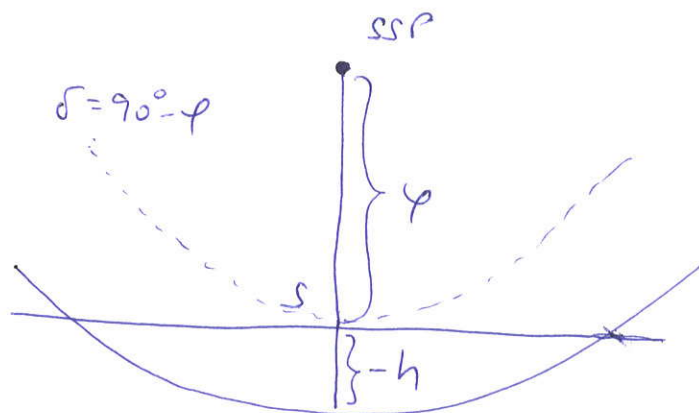
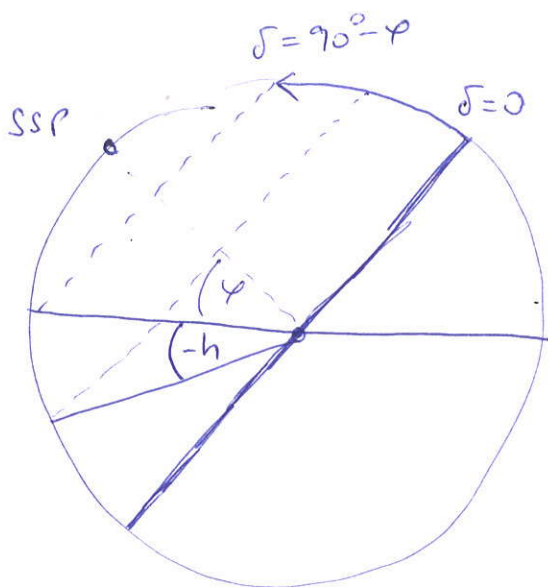


# Soumrak

$$\sin h = \sin \delta \sin \varphi + \cos \delta \cos \varphi \cos t$$

$$h = -6^\circ, -12^\circ, -18^\circ$$

## Celonoční soumrak



$$\delta = 90^\circ - \varphi - (-h) = \underline{\underline{90^\circ - \varphi + h}}$$

n-př.  $\varphi = 50^\circ, h = -18^\circ$

$$\delta = 90^\circ - 50^\circ - 18^\circ = 22^\circ$$

celonoční astr. soumrak, když  $\delta_0 > 22^\circ$  (1.6. - 20.7)

n-př.  $h = -6^\circ, \delta = 23,5^\circ$

$$\varphi = 90^\circ - 6^\circ - 23,5^\circ = \underline{\underline{60,5^\circ}}$$

bílá noc, když  $\varphi > 60,5^\circ$