1

$tg\,\delta = \frac{R}{h} \Rightarrow R = h\,tg\,\delta$

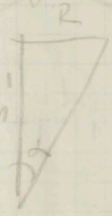
$tg\,\alpha = \frac{R}{h'} \Rightarrow R = h'tg\,\alpha \;//\; tg\,\beta = \frac{h'}{h}$

$h\,tg\,\delta = h'tg\,\alpha$

$h = \frac{tg\,\alpha}{tg\,\delta} \rightarrow h = h'\,\frac{tg\,\alpha}{tg\,\delta}$

$h' = h\,\frac{tg\,\delta}{tg\,\alpha}$

$tg\,\beta = \frac{h}{h'} \times \frac{1}{h'} \times \frac{tg\,\delta}{tg\,\alpha} = \frac{h}{h'}\,\frac{tg\,\delta}{tg^2\alpha}$



$tg\,\alpha = \frac{R}{h'}$

$h = \frac{R}{tg\,\alpha}$

$tg\,\delta = \frac{R}{h}$

$tg\,\beta = \frac{h}{h'}$

$h = \frac{R}{tg\,\delta}$

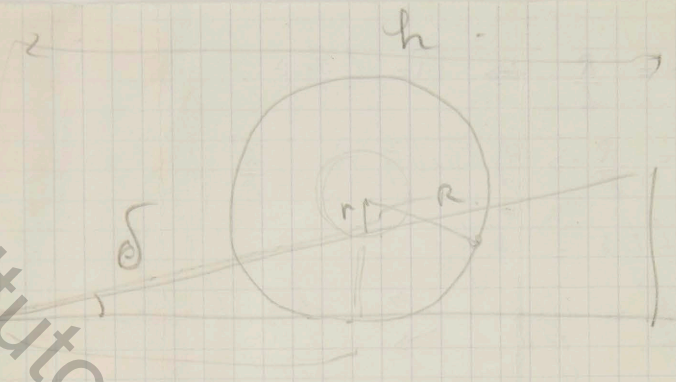
$h = \frac{h'}{tg\,\beta} \cdot \frac{R}{tg\,\beta}$

$\frac{R}{tg\,\delta} = \frac{R}{tg\,\alpha \cdot tg\,\beta}$

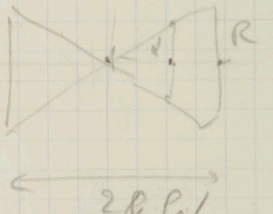
$\frac{R}{R} = \frac{tg\,\delta}{tg\,\alpha \cdot tg\,\beta} = 1$

$tg\,\delta = tg\,\alpha \cdot tg\,\beta$

$tg\,\alpha = \frac{tg\,\delta}{tg\,\beta}$

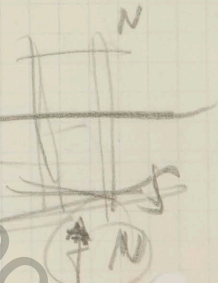


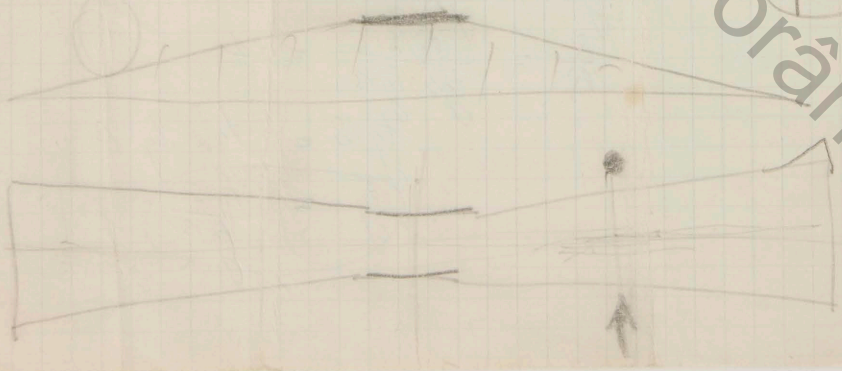
$$\operatorname{tg}\delta = \frac{r}{x}$$



$$\operatorname{tg}\alpha = \frac{R}{\ell h'}$$

$$\operatorname{tg}\beta = \frac{r}{h-x} = \frac{R}{\ell} \cdot \frac{\ell h}{h}$$





$tg\,\beta = \frac{l'}{L}$ | $l' = \frac{R}{tg\,\alpha}$ ← $tg\,\alpha = \frac{R}{l'}$ ②

$h = \frac{R}{tg\,\delta} = \frac{R}{tg\,\alpha \cdot tg\,\beta}$

$tg\,\alpha \frac{tg\,\beta}{tg\,\delta} = \frac{l'/h}{tg\,\alpha\, tg\,\beta}$

②; Ⓡ; $tg\,\alpha$; l'

$+ h^2 =$ hipotenusa

$tg\,\beta = \frac{R}{tg\,\alpha} \cdot \frac{1}{L} =$

$h = \frac{R}{tg\,\alpha \cdot tg\,\beta}$

$tg\,\beta = \frac{l'}{h} = \frac{R}{L\,tg\,\alpha} \Rightarrow L = \frac{R}{tg\,\alpha \cdot tg}$

$tg\,\delta = \frac{R}{L} \Rightarrow L = \frac{R}{tg\,\delta}$

$\frac{R}{tg\,\delta} = \frac{R}{tg\,\alpha \cdot tg\,\beta} \Rightarrow tg\,\alpha = \frac{tg\,\delta}{tg\,\beta}$

187000
57800
129200

8.092,00
578,00
7670,00