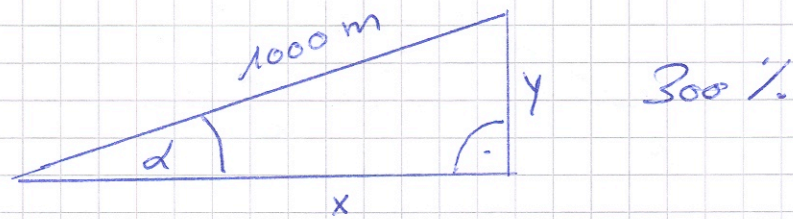


Gest BM 7M, 6.12.13

①



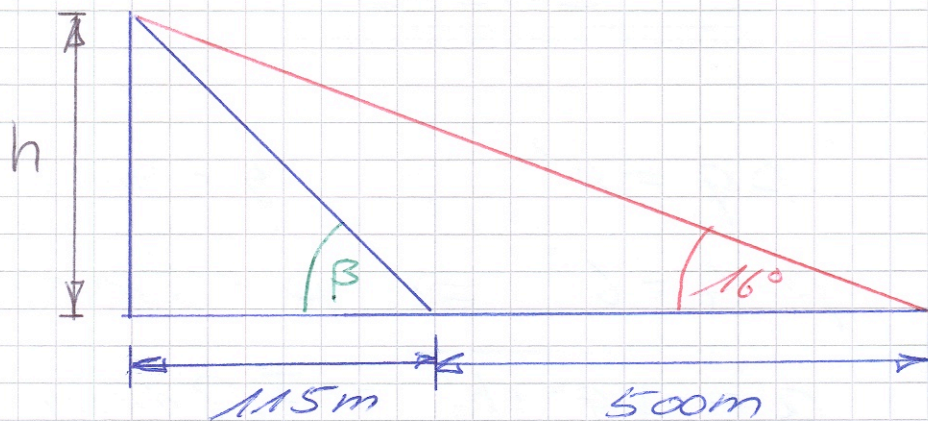
$$\tan \alpha = 300\% = 3$$

$$\alpha = \tan^{-1}(3) = \underline{\underline{71.565^\circ}}$$

$$\cos \alpha = \frac{x}{1000} \Rightarrow x = 1000 \cdot \cos \alpha = \underline{\underline{316.228 \text{ m}}}$$

$$\sin \alpha = \frac{y}{1000} \Rightarrow y = 1000 \cdot \sin \alpha = \underline{\underline{948.683 \text{ m}}}$$

②



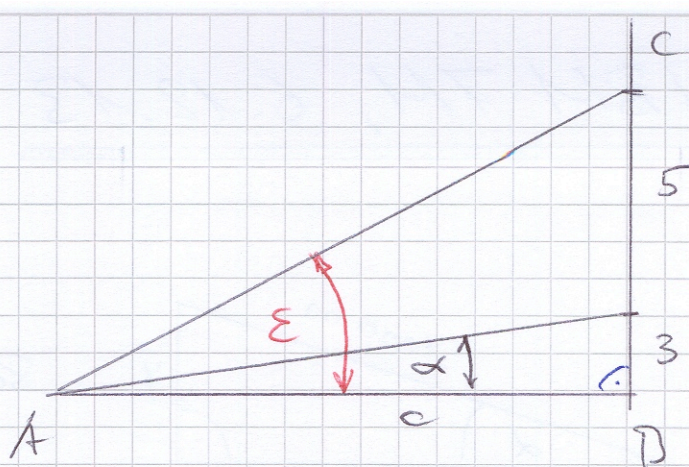
$$\tan 16^\circ = \frac{h}{615}$$

$$h = 615 \cdot \tan 16^\circ = \underline{\underline{176.348 \text{ m}}}$$

$$\tan \beta = \frac{h}{115}$$

$$\beta = \tan^{-1}\left(\frac{h}{115}\right) = \underline{\underline{56.891^\circ}}$$

3



$$\tan \alpha = \frac{3}{c} \quad | \cdot c : \tan \alpha$$

$$c = \frac{3}{\tan \alpha} = \frac{3}{\tan 12^\circ} = 14.114 \text{ m}$$

$$\tan \epsilon = \frac{8}{c} \Rightarrow \epsilon = \arctan\left(\frac{8}{c}\right)$$

$$\underline{\underline{\epsilon = 29.545^\circ}}$$

4

$$pq = h^2 \quad ; \quad q = 4 \text{ m}, h = 6 \text{ m}$$

$$p \cdot 4 = 6^2 \Rightarrow p = 9 \text{ m} \Rightarrow \underline{\underline{c = 13 \text{ m}}}$$

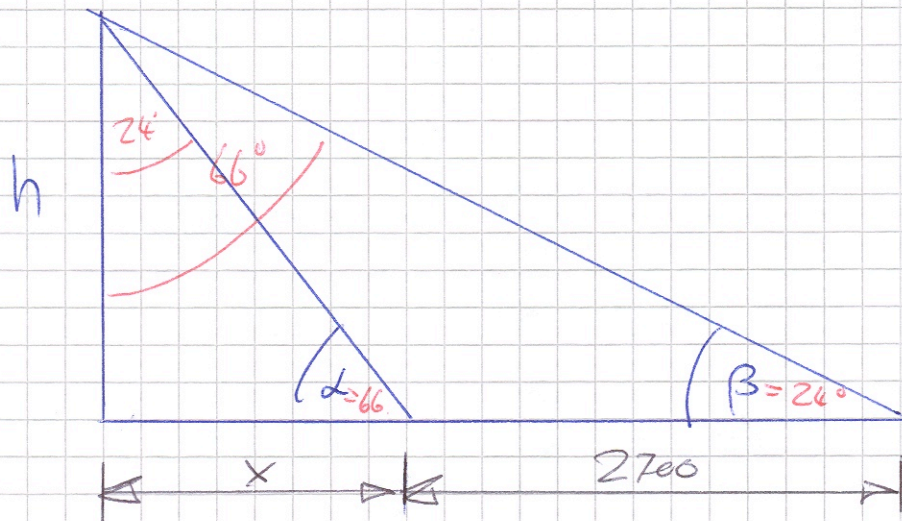
$$a = \sqrt{q^2 + h^2} = \underline{\underline{7.211 \text{ m}}}$$

$$b = \sqrt{(p+q)^2 - a^2} = \underline{\underline{10.817 \text{ m}}}$$

$$\sin \alpha = \frac{a}{c} \Rightarrow \alpha = \arcsin\left(\frac{a}{c}\right) = \underline{\underline{33.69^\circ}}$$

$$\sin \beta = \frac{b}{c} \Rightarrow \beta = \arcsin\left(\frac{b}{c}\right) = \underline{\underline{56.31^\circ}}$$

5



$$\tan \beta = \frac{h}{2700 + x}, \quad \tan \alpha = \frac{h}{x}$$

$$\tan \beta = \frac{h}{2700 + \frac{h}{\tan \alpha}}$$

$$x = \frac{h}{\tan \alpha}$$

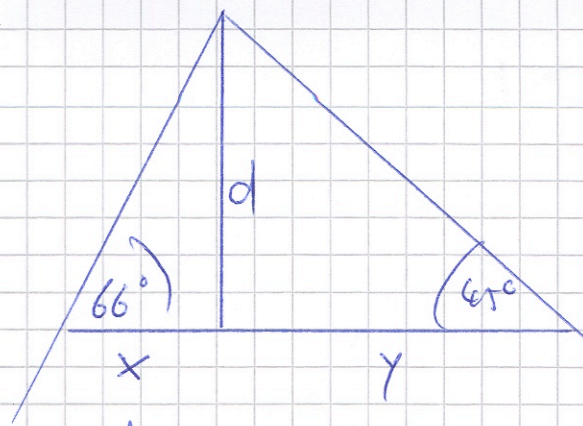
$$\tan \beta = \frac{\frac{h}{1}}{\frac{2700 \cdot \tan \alpha + h}{\tan \alpha}} = \frac{h \cdot \tan \alpha}{2700 \cdot \tan \alpha + h}$$

$$\tan \beta \cdot 2700 \cdot \tan \alpha + h \cdot \tan \beta = h \cdot \tan \alpha$$

$$= h (\tan \alpha - \tan \beta)$$

$$h = \frac{2700 \cdot \tan \alpha \cdot \tan \beta}{\tan \alpha - \tan \beta} = \underline{\underline{1499.327m}}$$

6



$$\tan 66^\circ = \frac{d}{x}$$

$$\tan 45^\circ = \frac{d}{y}$$

$$x = \frac{d}{\tan 66}$$

$$y = \frac{d}{\tan 45}$$

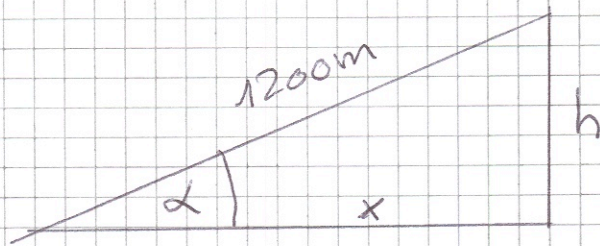
$$x + y = 100$$

$$\frac{d}{\tan 66} + \frac{d}{\tan 45} = 100$$

$$d \left(\frac{1}{\tan 66} + \frac{1}{\tan 45} \right) = 100$$

$$d = \frac{100}{\frac{1}{\tan 66} + \frac{1}{\tan 45}} = \underline{\underline{69.193 \text{ m}}}$$

①



$$\tan \alpha = 400\% = 4$$

$$\alpha = \underline{\underline{\arctan(4) = 75.964^\circ}}$$

$$\sin \alpha = \frac{h}{1200} \Rightarrow h = 1200 \cdot \sin \alpha = \underline{\underline{1164.171m}}$$

$$\cos \alpha = \frac{x}{1200} \Rightarrow 1200 \cdot \cos \alpha = x = \underline{\underline{291.043m}}$$

$$75.96^\circ / h = 1164.17m / x = 291.04m$$

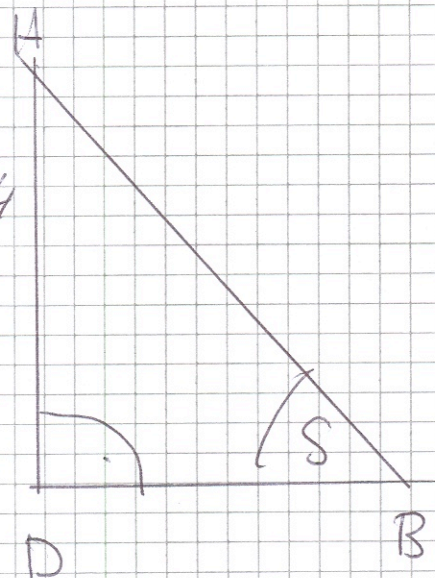
③

$$\overline{DB} = \sqrt{4^2 + 5^2} = \sqrt{41} \approx 6.4$$

$$\overline{AD} = 6$$

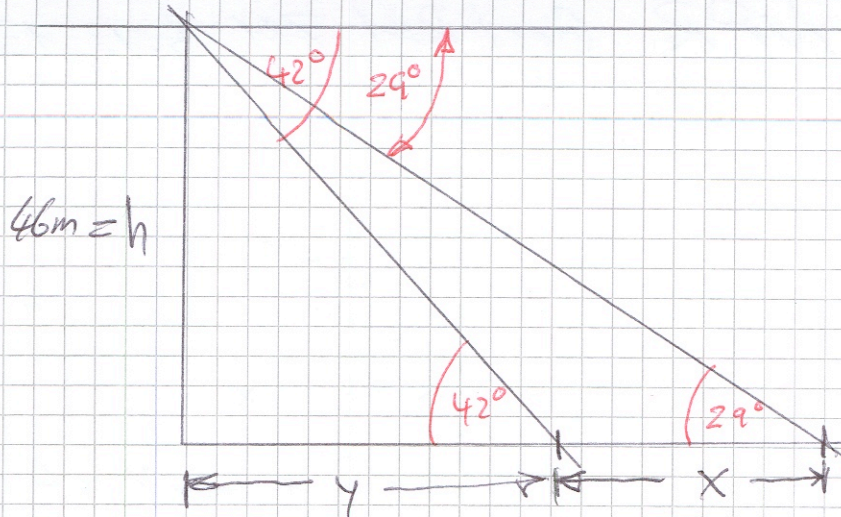
$$\begin{aligned} \tan \delta &= \frac{\overline{AD}}{\overline{DB}} = \frac{6}{\sqrt{41}} \\ &= \frac{6 \cdot \sqrt{41}}{41} \end{aligned}$$

$$\begin{aligned} \delta &= \arctan\left(\frac{6\sqrt{41}}{41}\right) = 43.138^\circ \\ &= \underline{\underline{43.14^\circ}} \end{aligned}$$



②, ④ → siehe normale Pr.

5



$$\tan 42^\circ = \frac{h}{y} \quad \tan 29^\circ = \frac{h}{x+y}$$

$$y = \frac{h}{\tan 42^\circ} \quad x + y = \frac{h}{\tan 29^\circ}$$

$$x + \frac{h}{\tan 42^\circ} = \frac{h}{\tan 29^\circ}$$

$$x = \frac{h}{\tan 29^\circ} - \frac{h}{\tan 42^\circ} \approx \underline{\underline{31.9 \text{ m}}}$$

6

$$h = \frac{6.5}{\frac{1}{\tan 80^\circ} + \frac{1}{\tan 40^\circ}} \approx 4.75 \text{ m}$$