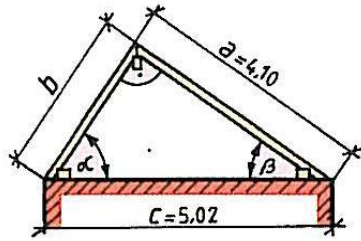


Beispiel:

- Wie groß ist  
 a) der Winkel  $\alpha$ ,  
 b) der Winkel  $\beta$ ,  
 c) die Sparrenlänge  $b$ ?



$$\sin \alpha = \frac{GK}{H} \quad \sin \alpha = \frac{4,10}{5,02} \quad \sin \alpha = 0,816$$

$$\alpha = \sin^{-1}(0,816\dots)$$

SPEICHERN

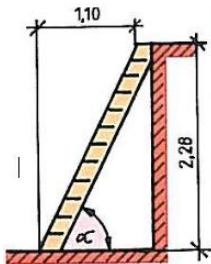
$$\alpha = 54,759085880496302692174862482147$$

$$\beta = 180 - 54,759 - 90 =$$

$$35,24091411950369730782513751785$$

$$b = \sqrt{5,02^2 - 4,10^2}$$

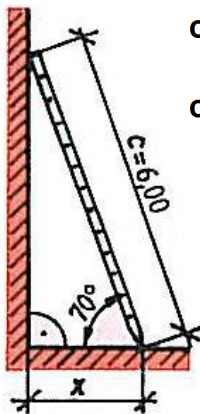
$$b = 2,8966187184370676161267856411976$$



Wie groß ist der  
 Aufstellwinkel  $\alpha$ ?

$$\tan \alpha = \frac{GK}{AK} \quad \tan \alpha = \frac{2,28}{1,10} \quad \tan \alpha = 2,0727\dots$$

$$\alpha = \tan^{-1}(2,07) = 64,245$$

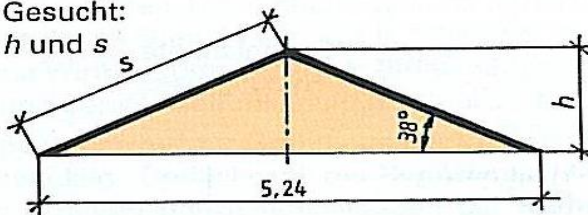


$$\cos 70 = \frac{x}{6}$$

$$\cos 70 \cdot 6 = x = 2,05$$

#### 4. Symmetrisches Satteldach

Gesucht:  
 $h$  und  $s$



$$\tan 38 = h$$

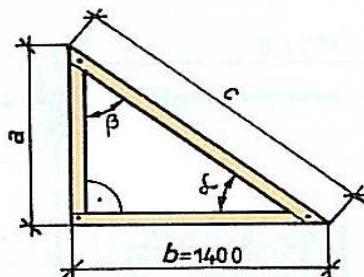
$$\tan 38 \cdot 2,62 = h = 2,05$$

$$s = \sqrt{h^2 + 2,62^2} = 3,32$$

#### 5. Anreißwinkel mit den Seitenverhältnissen

$a : b : c = 3 : 4 : 5$

Gesucht:  
 $a$ ,  $c$ ,  $\alpha$  und  $\beta$



$$b = 4 \text{ Teile} = 1400$$

$$1 \text{ Teil} = 350$$

$$a = 3 \text{ Teile} = 1050$$

$$c = 5 \text{ Teile} = 1750$$

$$\sin \alpha = \frac{GK}{H}$$

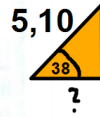
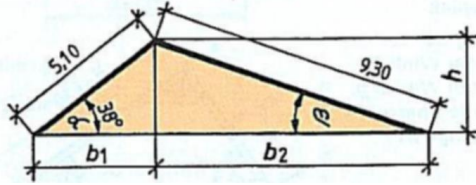
$$\sin \alpha = \frac{1050}{1750} = 0,6$$

$$\alpha = 36,87^\circ$$

$$\beta = 180 - 90 - \alpha = 53,13^\circ$$

6. Unsymmetrisches Satteldach

Gesucht:  $b_1$ ,  $h$ ,  $\beta$  und  $b_2$



$$\cos \alpha = \frac{b_1}{5,10}$$

$$\cos 38 = \frac{b_1}{5,10}$$

$$\cos 38 \cdot 5,10 = b_1$$

$$4,02 = b_1$$

$$h = \sqrt{5,10^2 - 4,02^2}$$

$$\sin \beta = \frac{GK}{H}$$

$$\sin \beta = \frac{3,14}{9,30} = 0,34$$

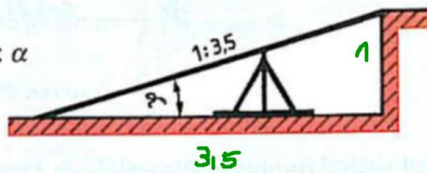
$$\beta = \sin^{-1}(0,34) = 19,73$$

$$b_2 = \sqrt{9,30^2 - 3,14^2}$$

$$b_2 = 8,754$$

7. Rampe

Gesucht:  $\alpha$



$$\tan \alpha = \frac{GK}{AK}$$

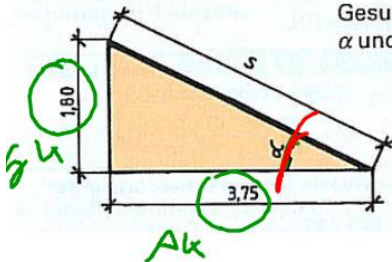
$$\tan \alpha = \frac{1}{3,5}$$

$$\tan \alpha = 0,28$$

$$\alpha = 15,95^\circ$$

8. Pultdach

Gesucht:  
 $\alpha$  und  $s$

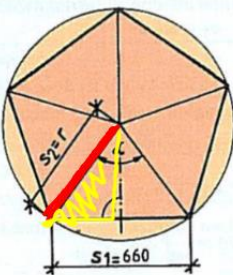


$$\tan \alpha = \frac{GK}{AK} \quad \tan \alpha = \frac{1,8}{3,75}$$

$$\tan \alpha = 0,48$$

$$\alpha = \tan^{-1}(0,48) = 25,64^\circ$$

9. Tischplatte



Gesucht:  
 $\alpha$  (Die Winkelsumme im Vollkreis beträgt  $360^\circ$ ),  
 $s_2 = r$  ( $r$  = Radius des Umkreises).

$$\alpha = 360 : 5 = 72^\circ$$

$$\sin \alpha = \frac{GK}{H}$$

$$\sin 36 = \frac{330}{H}$$

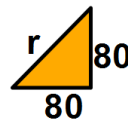
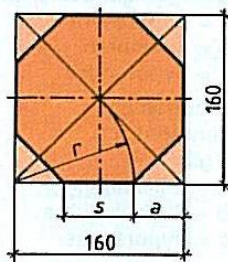
$$H = \frac{330}{\sin 36} = 561,43$$

14. Aus einem quadratischen Holz ( $160 \text{ mm} \times 160 \text{ mm}$ ) soll ein regelmäßig achteckiger Spindelpfosten für eine Treppe hergestellt werden.

Berechnen Sie:

a) die Länge des Anreißmaßes  $a$ ,

b) die Seitenlänge  $s$ .



$$r = \sqrt{80^2 + 80^2}$$

$$r = 113,14$$

$$a = 160 - r = 46,86$$

$$s = 160 - a - a = 66,27$$