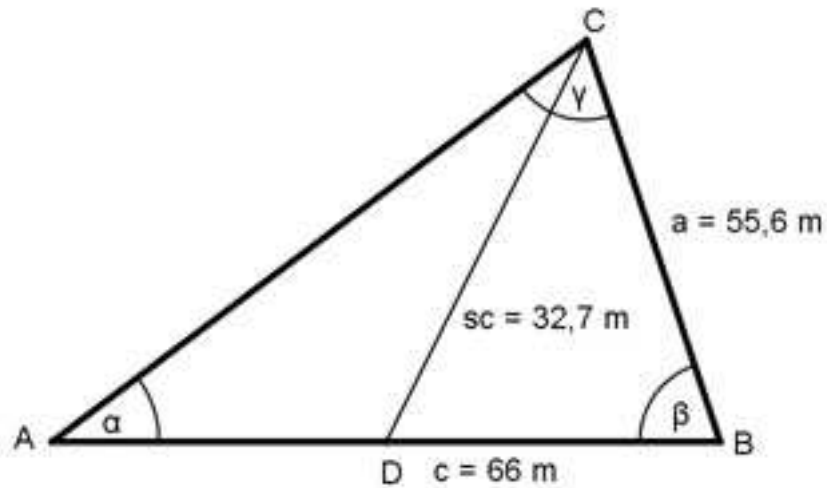


Trigonometrie Aufgabe 145

Berechnen Sie den Winkel α , wenn $a = 55,6 \text{ m}$, $c = 66 \text{ m}$ und die Seitenhalbierende $s_c = 32,7 \text{ m}$.



$$DB = c/2 \text{ m} = 66/2 \text{ m} = 33 \text{ m}$$

Fall SSS im Dreieck DBC:

Cosinussatz:

$$s_c^2 = a^2 + (c/2)^2 - 2 * a * (c/2) * \cos \beta \quad | \quad + 2 * a * (c/2) * \cos \beta$$

$$s_c^2 + 2 * a * (c/2) * \cos \beta = a^2 + (c/2)^2 \quad | \quad -s_c^2$$

$$2 * a * (c/2) * \cos \beta = a^2 + (c/2)^2 - s_c^2 \quad | \quad : 2 * a * (c/2)$$

$$\cos \beta = \frac{a^2 + (c/2)^2 - s_c^2}{2 * a * (c/2)} = \frac{55,6^2 \text{ m}^2 + 33^2 \text{ m}^2 - 32,7^2 \text{ m}^2}{2 * 55,6 \text{ m} * 33 \text{ m}} = 0,8478$$

$$\beta = 32^\circ$$

Im Dreieck ABC:

Fall SWS:

Cosinussatz:

$$AC^2 = a^2 + c^2 - 2 * a * c * \cos \alpha$$

$$AC^2 = 55,6^2 \text{ m}^2 + 66^2 \text{ m}^2 - 2 * 55,6 \text{ m} * 66 \text{ m} * \cos 32^\circ$$

$$AC^2 = 55,6^2 \text{ m}^2 + 66^2 \text{ m}^2 - 2 * 55,6 \text{ m} * 66 \text{ m} * 0,848$$

$$AC^2 = 1\,223,7 \text{ m}^2 \quad | \quad \sqrt{\quad}$$

$$AC = 35 \text{ m}$$

Fall SSW:

$$\frac{a}{\sin \alpha} = \frac{AC}{\sin \beta} \quad | \quad * \sin \alpha$$

$$a = \frac{AC * \sin \alpha}{\sin \beta} \quad | \quad * \sin \beta$$

$$a * \sin \beta = AC * \sin \alpha \quad | \quad : b$$

$$\sin \alpha = \frac{a * \sin \beta}{AC} = \frac{55,6 \text{ m} * \sin 32^\circ}{35 \text{ m}} = \frac{55,6 \text{ m} * 0,5299}{35 \text{ m}} = 0,8418 \quad \text{-->}$$

$$\alpha = 57,3^\circ$$