

Trigonometrie Aufgabe 231

$$\sqrt{3} * \cos x + \sin x = 1$$

$$\sqrt{3} * \sqrt{1 - \sin^2 x} + \sin x = 1 \quad | -\sin x$$

$$\sqrt{3} * \sqrt{1 - \sin^2 x} = 1 - \sin x \quad |^2$$

$$3 * (1 - \sin^2 x) = 1 - 2 * \sin x + \sin^2 x$$

$$3 - 3 * \sin^2 x = 1 - 2 * \sin x + \sin^2 x \quad | +3 * \sin^2 x$$

$$3 = 1 - 2 * \sin x + 4 * \sin^2 x \quad | -3$$

$$4 * \sin^2 x - 2 * \sin x - 2 = 0 \quad | :2$$

$$2 * \sin^2 x - \sin x - 1 = 0$$

A, B, C - Formel:

$$A = 2, B = -1, C = -1$$

$$\sin x_{1,2} = \frac{-(-1) \pm \sqrt{(-1)^2 - 4 * 2 * (-1)}}{2 * 2}$$

$$\sin x_{1,2} = \frac{1 \pm \sqrt{1 + 8}}{4}$$

$$\sin x_{1,2} = \frac{1 \pm \sqrt{9}}{4} = \frac{1 \pm 3}{4}$$

$$\sin x_1 = \frac{1 + 3}{4} = 1 \quad \rightarrow x_1 = 90^\circ$$

$$\sin x_2 = \frac{1 - 3}{4} = -0,5 \quad \rightarrow x_2 = 330^\circ \text{ oder } 210^\circ > 180^\circ$$

Probe:

$$90^\circ \quad \sqrt{3} * \cos 90^\circ + \sin 90^\circ = 1$$

$$\sqrt{3} * 0 + 1 = 1$$

Lösungsmenge $L = \{90^\circ\}$