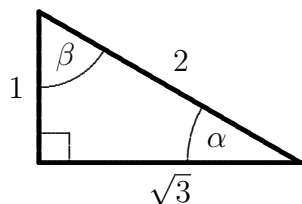


Brückenkurs Mathematik für Studierende der Chemie Lösungen zu Übung 5

Trigonometrie (Fortsetzung) und Polarkoordinaten

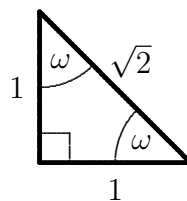
1. Alle zu untersuchenden Winkel sind kleiner als 90° :



$$\sin(\alpha) = \frac{1}{2} \Rightarrow \alpha = 30^\circ \hat{=} \frac{\pi}{6}$$

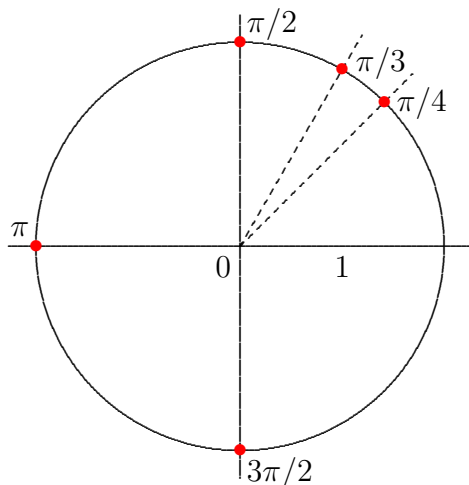
$$(\beta = 180^\circ - 90^\circ - \alpha = 60^\circ)$$

$$\sin(\beta) = \frac{\sqrt{3}}{2} \Rightarrow \beta = 60^\circ \hat{=} \frac{\pi}{3}$$



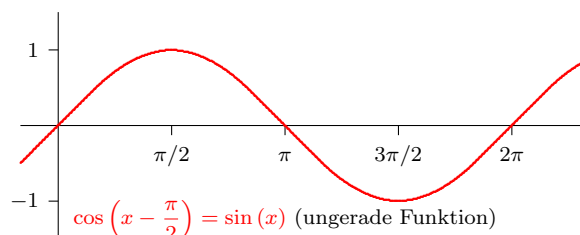
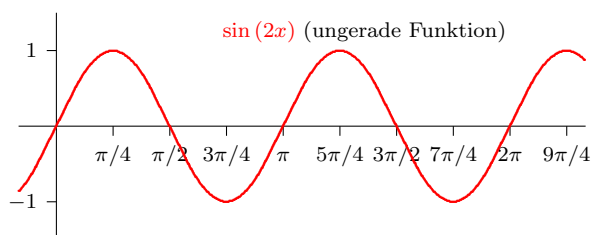
$$\tan(\omega) = 1 \Rightarrow \omega = 45^\circ \hat{=} \frac{\pi}{4}$$

- 2.



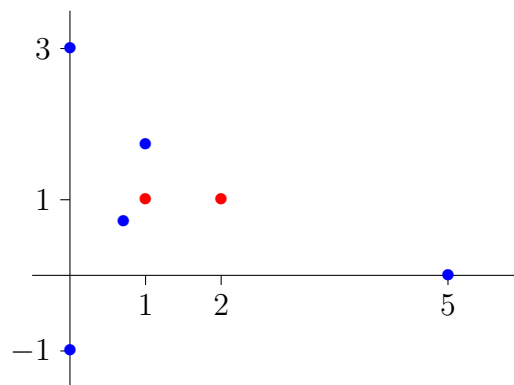
α	$\sin(\alpha)$	$\tan(\alpha)$
$\pi/4$	$1/\sqrt{2}$	1
$\pi/3$	$\sqrt{3}/2$	$\sqrt{3}$
$\pi/2$	1	—
π	0	0
$3\pi/2$	-1	—

- 3.



- 4.

x	y	r	ϕ	x	y	r	ϕ
1	1	$\sqrt{2}$	45°	1	$\sqrt{3}$	2	60°
2	1	$\sqrt{5}$	$26,6^\circ$	0	3	3	90°
5	0	5	0°	0	-1	1	270°
$1/\sqrt{2}$	$1/\sqrt{2}$	1	45°				



5. Sie erinnern sich doch sicher noch ($r e^{i\varphi} = x + iy$ mit $r = 1$ und $\varphi = \pi$): $e^{i\pi} = -1$.