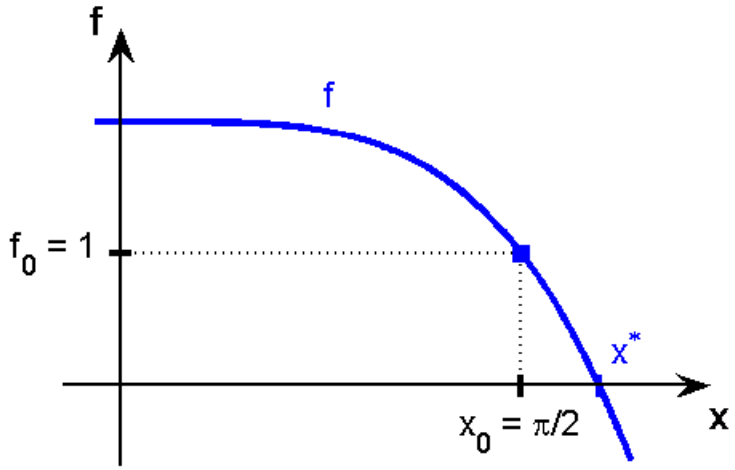
Beispiel 6.6: Newtonverfahren

gesucht

Kleinste positive Lösung von

$$f(x) = \cos x \cosh x + 1 = 0$$



Newtonverfahren

$$x_{k+1} = x_k - \frac{f(x_k)}{f'(x_k)}, \quad \text{Startwert } x_0 := \frac{\pi}{2}$$

k	x_k	$f(x_k)$	$f'(x_k)$	$\lvert x_k - x^* \rvert$
0	1.570796326794897	$1.0000_E + 00$	-2.5092	$3.0431_E - 01$
1	1.969333142133283	$-4.1751_E - 01$	-4.7298	$9.4229_E - 02$
2	1.881060554590512	$-2.4757_E - 02$	-4.1744	$5.9565_E - 03$
3	1.875129963043149	$-1.0716_E - 04$	-4.1383	$2.5894_E - 05$
4	1.875104069204172	$-2.0368_E - 09$	-4.1381	$4.9221_E - 10$
5	1.875104068711961	$2.2204_E - 16$	-4.1381	$< 1.0_E - 16$
6	1.875104068711961