The sinc function $\text{sinc}\left[\tfrac{1}{2}(\omega-\omega_o)\Delta t_o\right] \equiv \sin\left[\tfrac{1}{2}(\omega-\omega_o)\Delta t_o\right]/\left[\tfrac{1}{2}(\omega-\omega_o)\Delta t_o\right]$ for sine-wave signals of {short} time duration $\Delta t_o = 1\tau_o, 2\tau_o, 3\tau_o, 4\tau_o$ where $\tau_o = 1/f_o$ and the corresponding # of cycles of oscillation $N_c \equiv \Delta t_o/\tau_o = 1,2,3,4$ are shown in the figure below. Note that the ***width*** Δf_o of the main peak (at $f = f_o$) depends ***inversely*** on the time duration Δt_o of the signal, due to the ***uncertainty principle*** $\Delta f\,\Delta t = 1$.