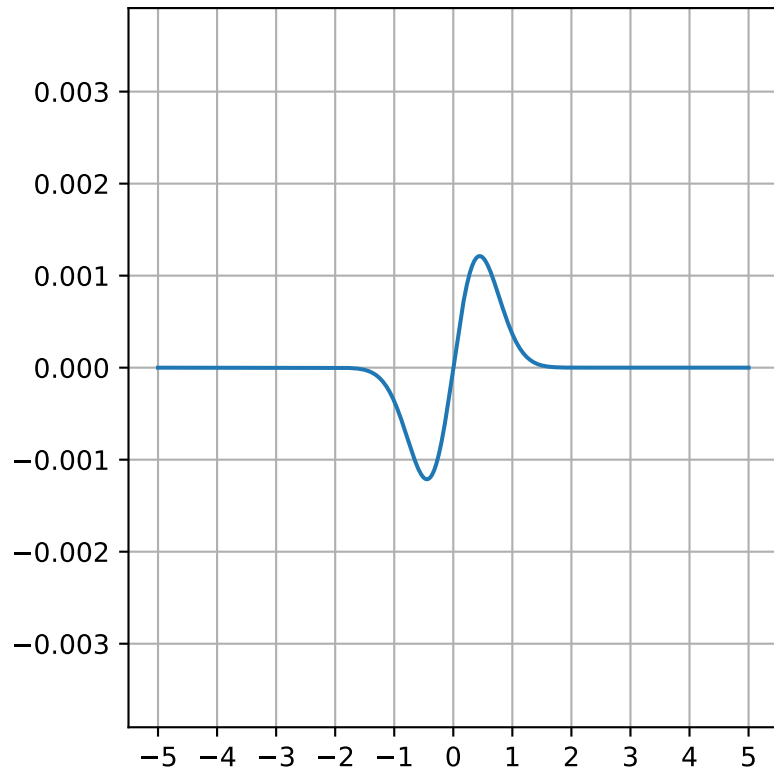$\mathcal{I}^N(y_k)$ for different $1/N$