

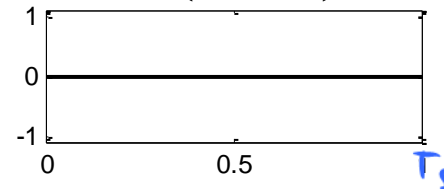
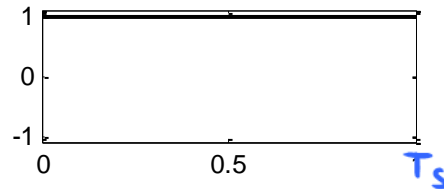
OFDM Carriers: $N = 4 \rightarrow 4$ frequencies

$$\cos\left(\frac{2\pi kt}{T_s}\right)$$

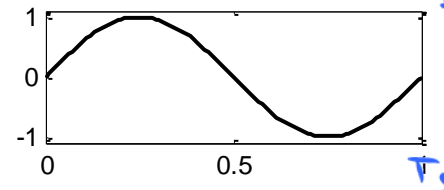
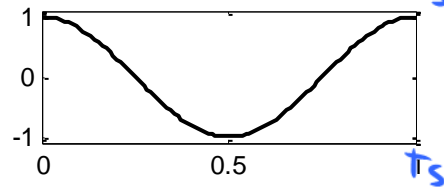
$$\sin\left(\frac{2\pi kt}{T_s}\right)$$

$(T_s = 1)$

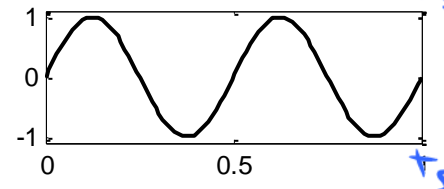
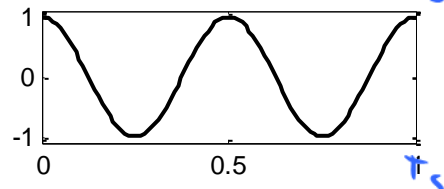
$k=0$



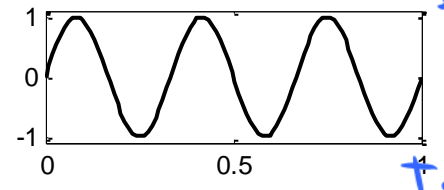
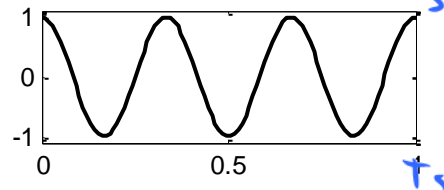
$k=1$



$k=2$



$k=3$



OFDM as a Multicarrier Technique

$$\text{Re}\{s(t)\} = \frac{1}{\sqrt{N}} \sum_{k=0}^{N-1} \left(\text{Re}\{S_k\} \cos\left(\frac{2\pi kt}{T_s}\right) - \text{Im}\{S_k\} \sin\left(\frac{2\pi kt}{T_s}\right) \right)$$

$N=4$
 $\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{4}} = \frac{1}{2}$

