

REDUÇÃO DE TAXA DE AMOSTRAGEM POR FATOR M NATURAL

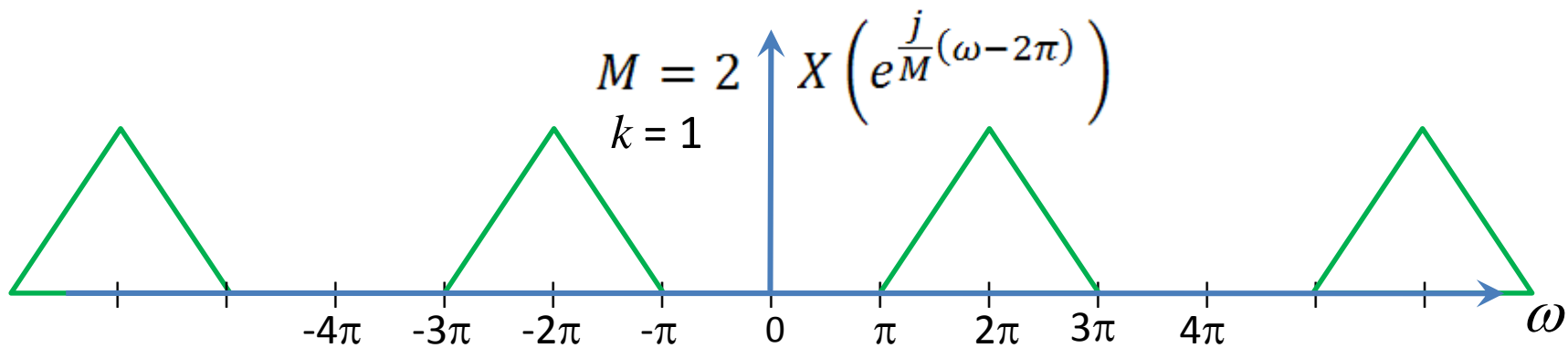
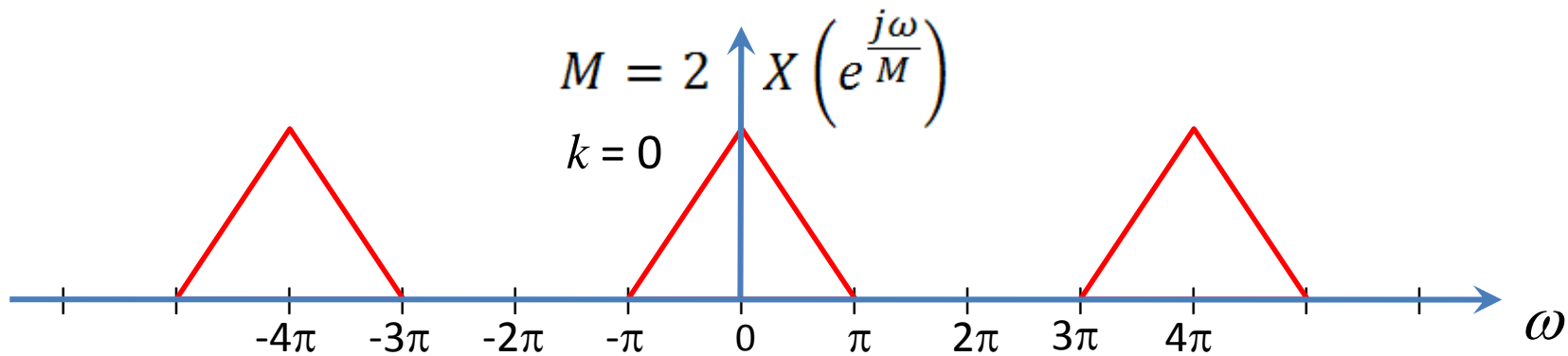
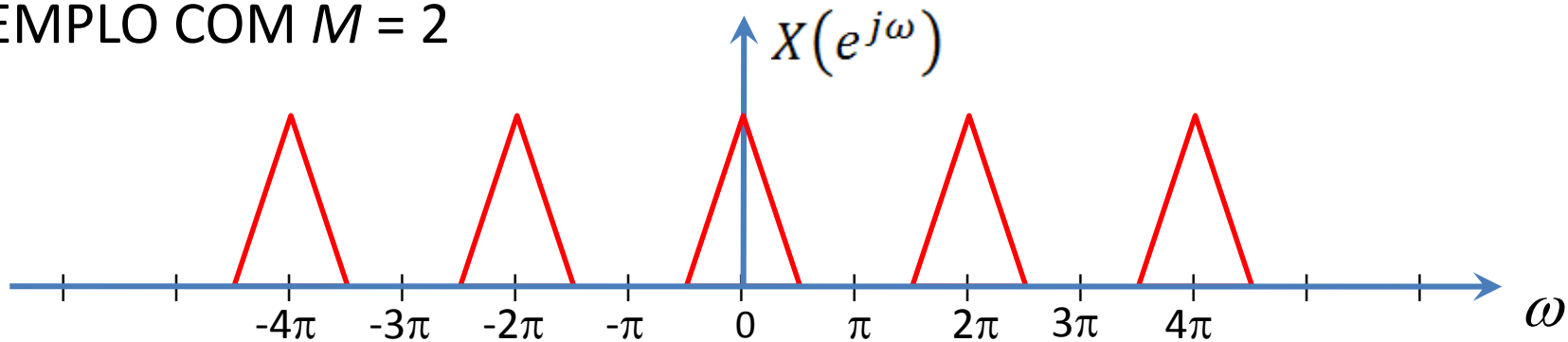
$$M > 1$$

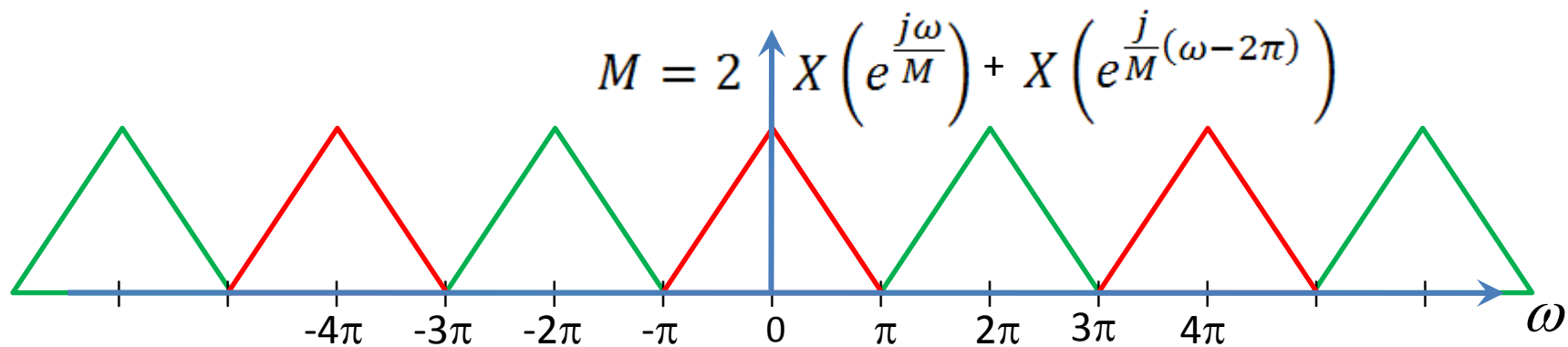
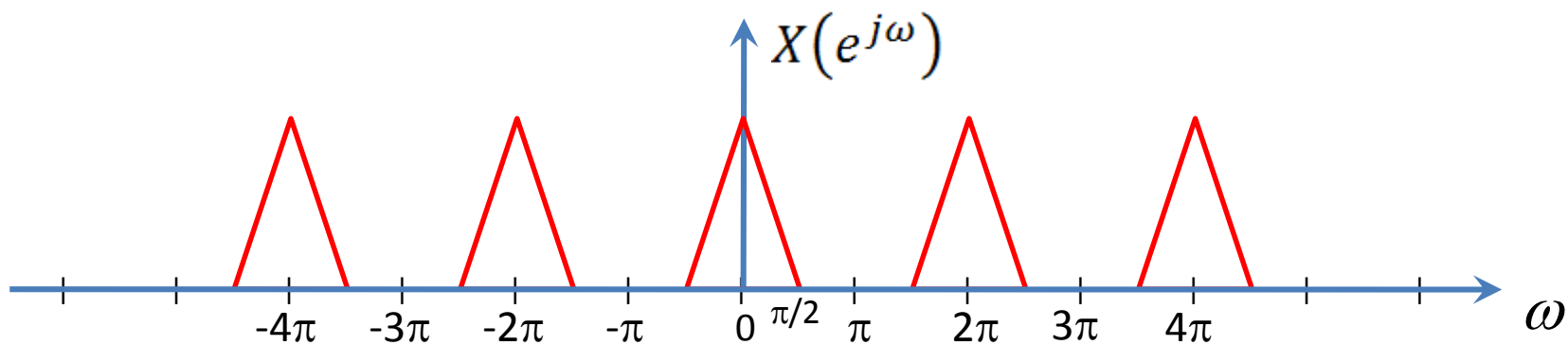
$$x[n] \rightarrow \downarrow M \rightarrow x[Mn] = x_d[n]$$

$$x[n] \xleftrightarrow{DTFT} X(e^{j\omega}) \qquad x_d[n] \xleftrightarrow{DTFT} X_d(e^{j\omega}) = \frac{1}{M} \sum_{k=0}^{M-1} X\left(e^{j\left(\frac{\omega}{M} + \frac{2\pi k}{M}\right)}\right)$$

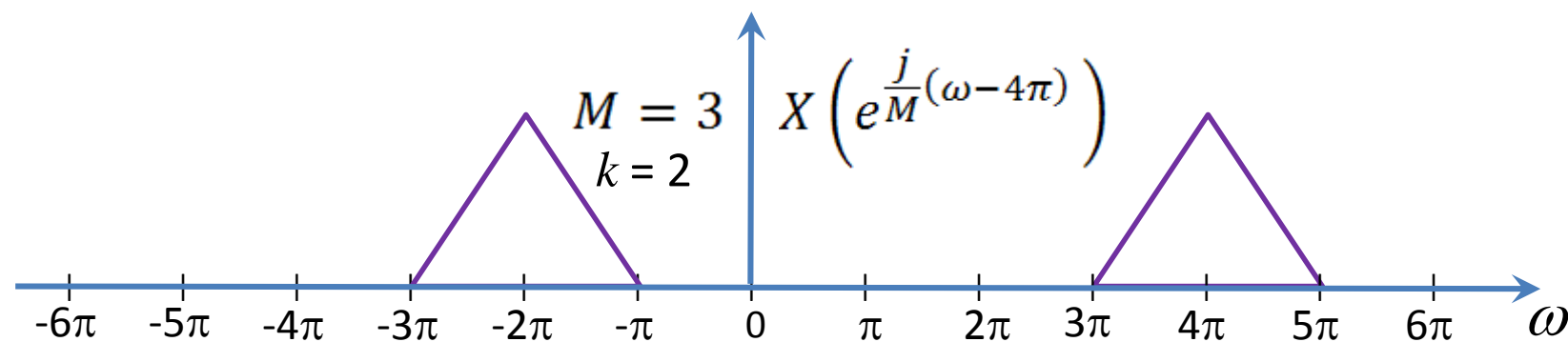
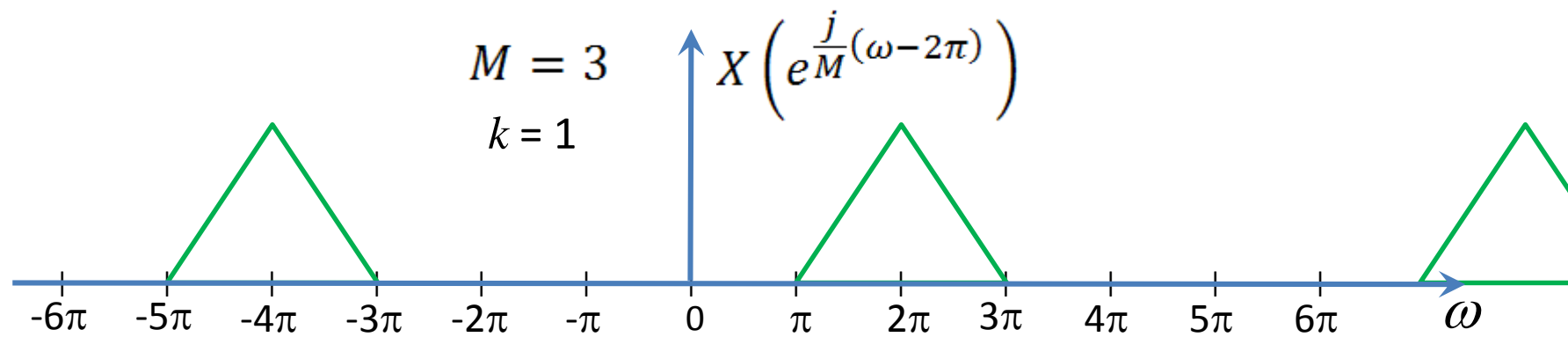
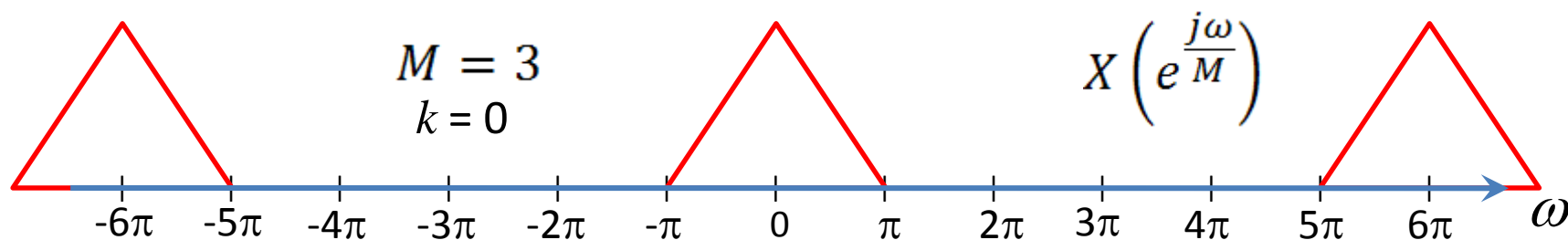
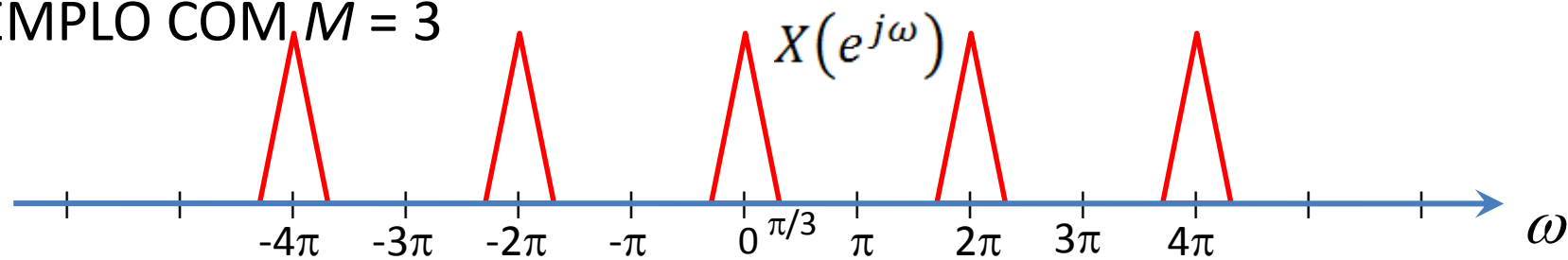
$X(e^{j\omega/M})$ é a versão expandida por M de $X(e^{j\omega})$

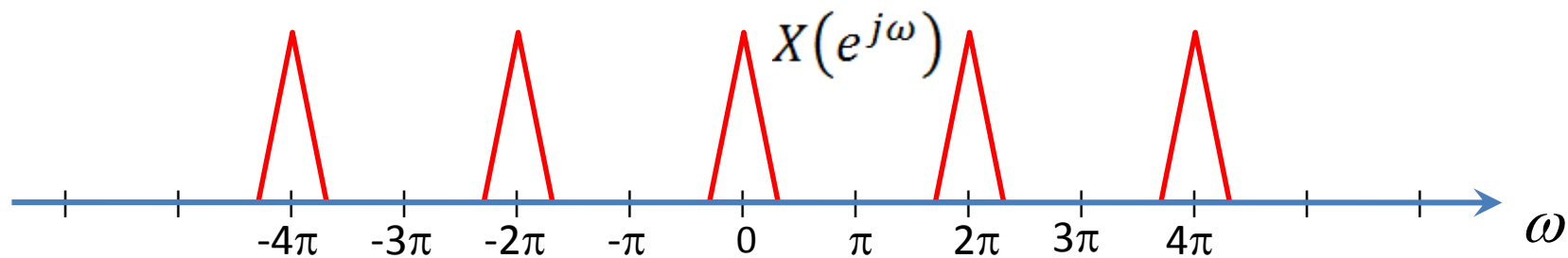
EXEMPLO COM $M = 2$



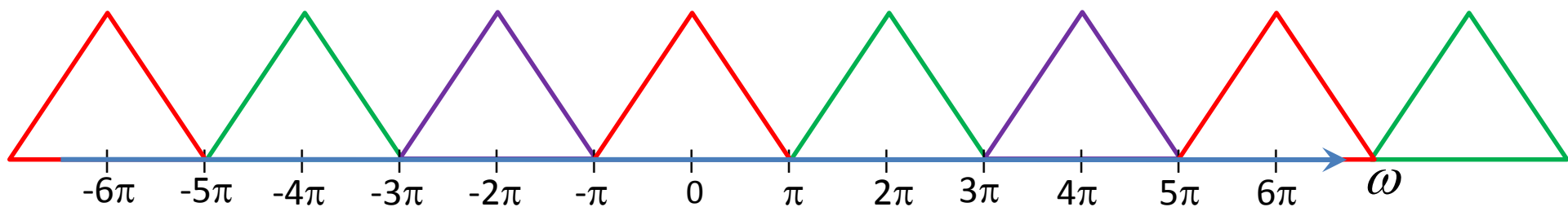


EXEMPLO COM $M = 3$





$$M = 3 \qquad X_d(e^{j\omega}) = \frac{1}{M} \sum_{k=0}^{M-1} X\left(e^{j\frac{(\omega-2\pi k)}{M}}\right)$$



$$X_d(e^{j\omega}) = \frac{1}{M} \left(X\left(e^{j\frac{\omega}{M}}\right) + X\left(e^{j\frac{\omega-2\pi}{M}}\right) + X\left(e^{j\frac{\omega-4\pi}{M}}\right) \right)$$