



Ingeniería Informática

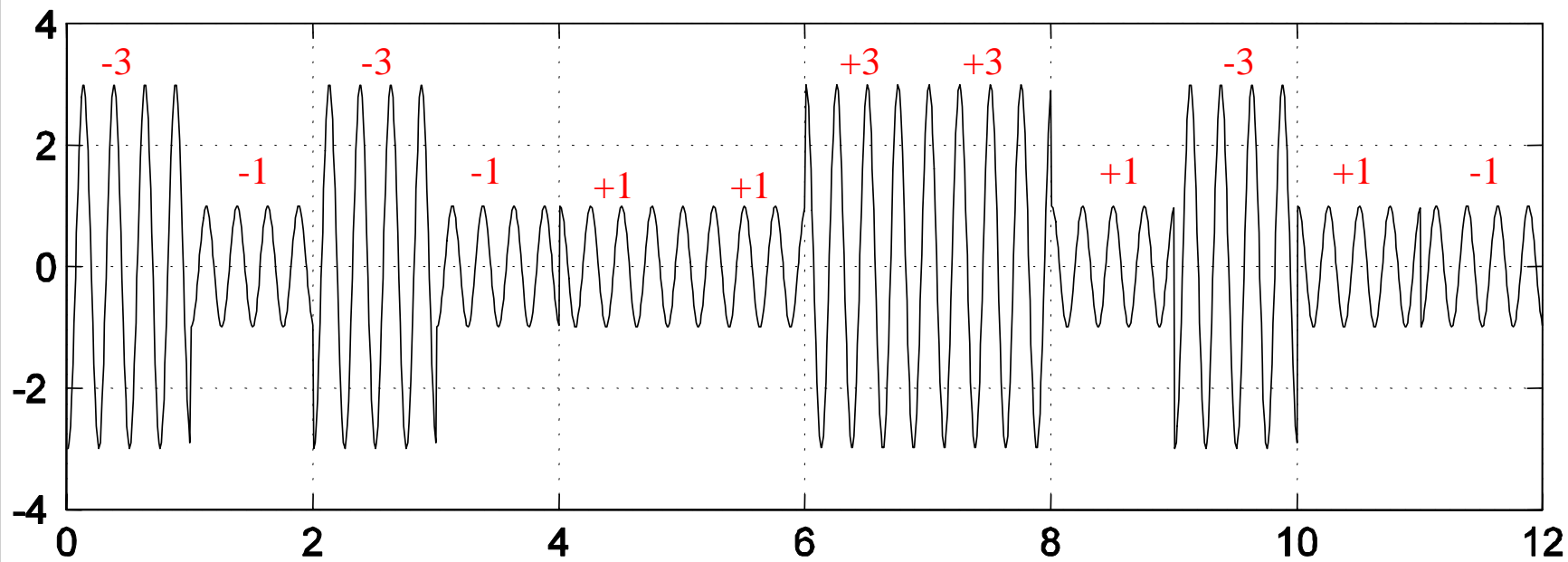
Medios de Transmisión (MT)

Tema 9

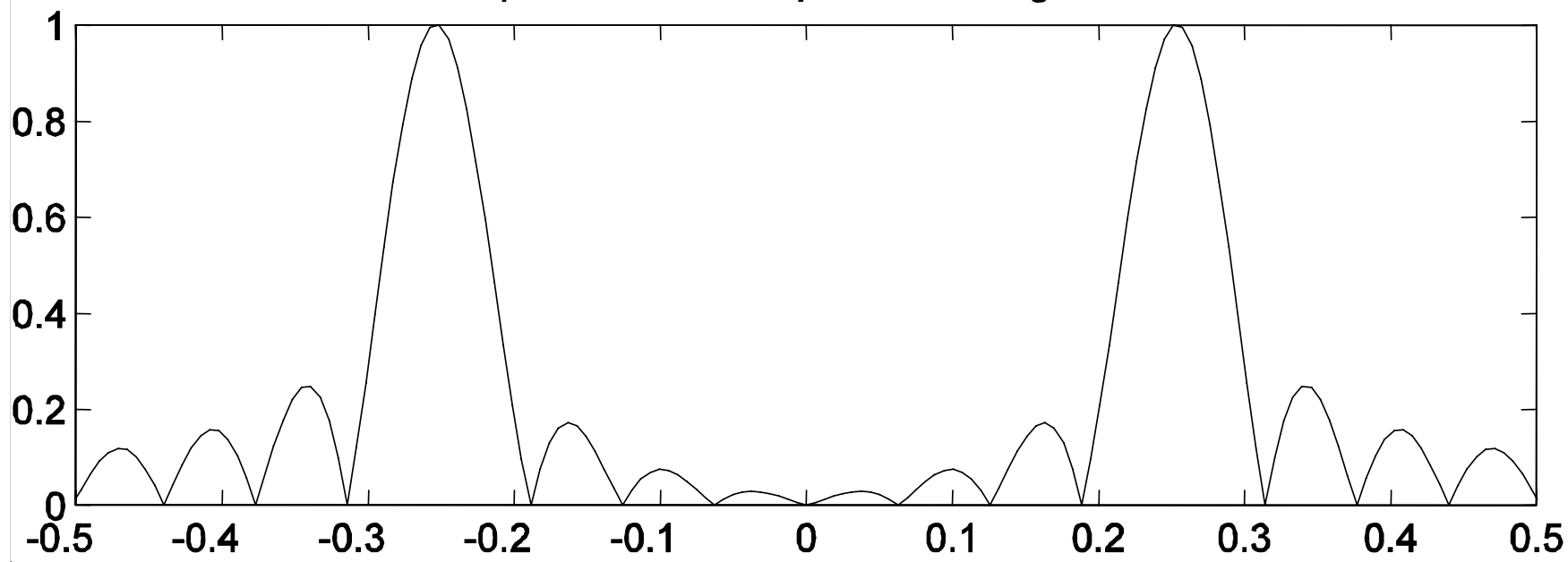
Transmisión digital paso banda

Curso 2008-09

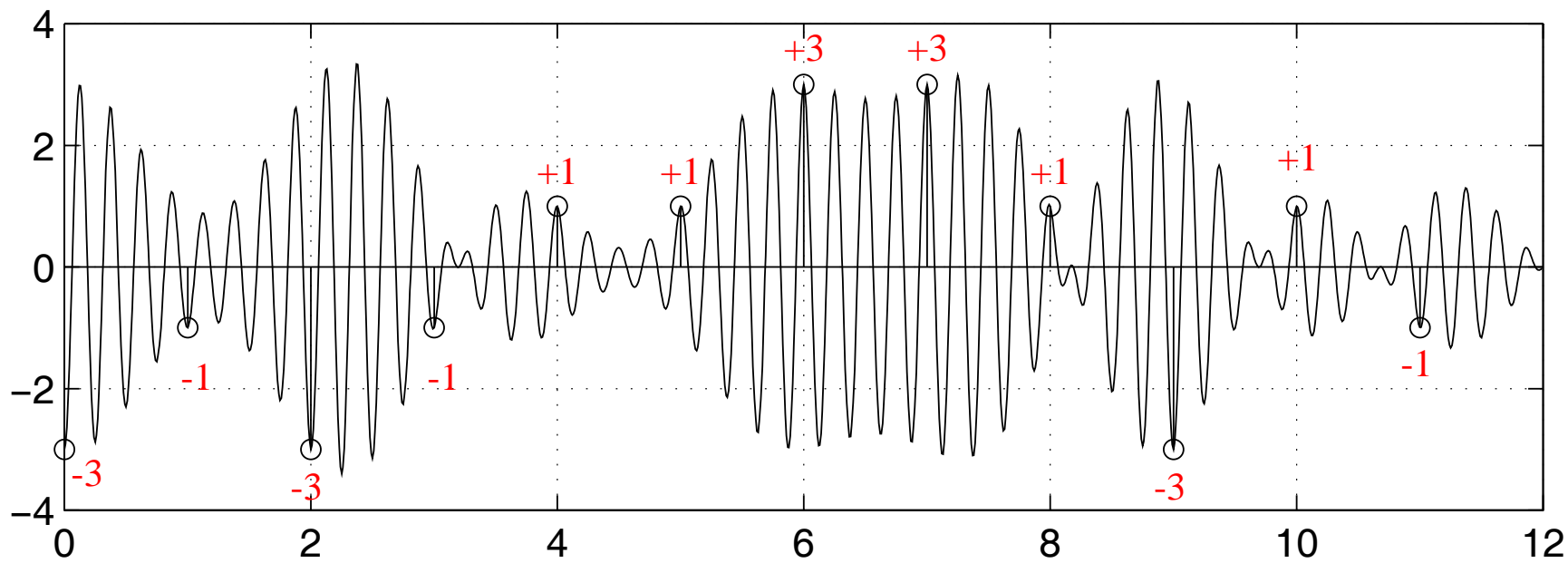
Tren de pulsos 4 ASK



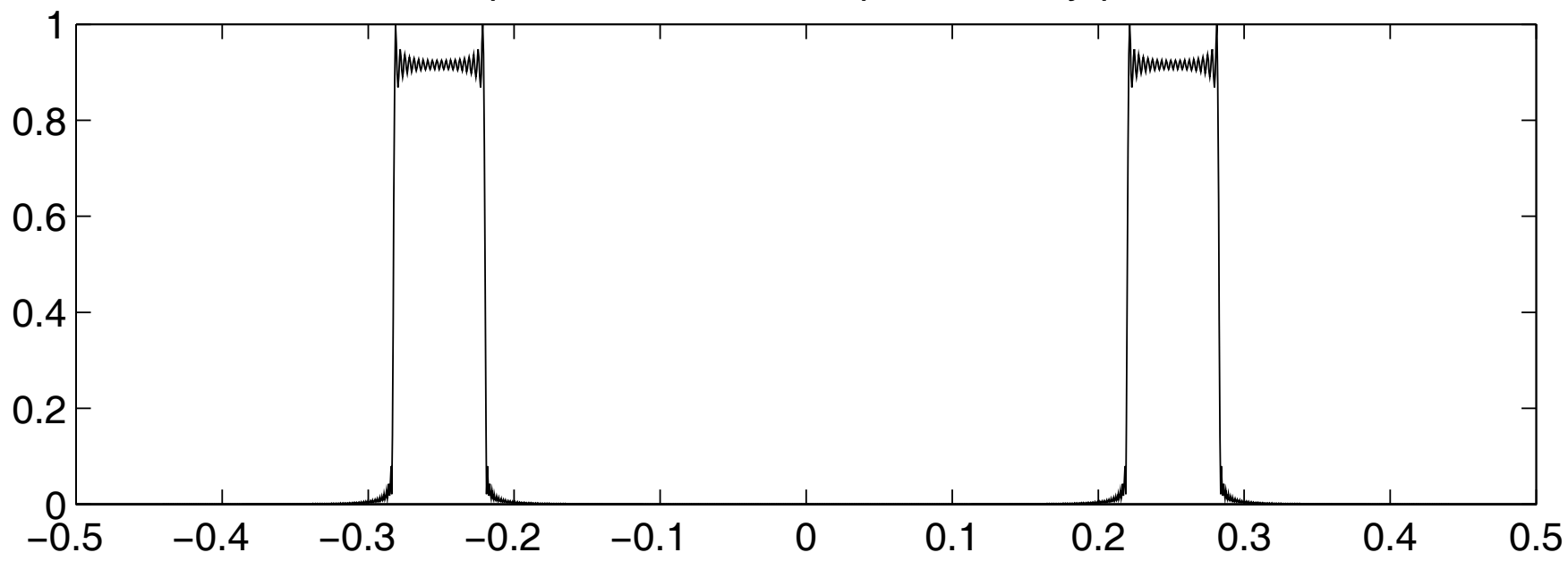
Espectro de 4 ASK pulsos rectangulares



Tren de pulsos 4 ASK



Espectro de 4 ASK con pulsos de Nyquist



Probabilidad de error de un sistema M-ASK

$$p(e) = \frac{2(M-1)}{M} Q\left(\sqrt{\frac{6 \log_2 M}{M^2 - 1} \frac{E_b}{N_0}}\right)$$

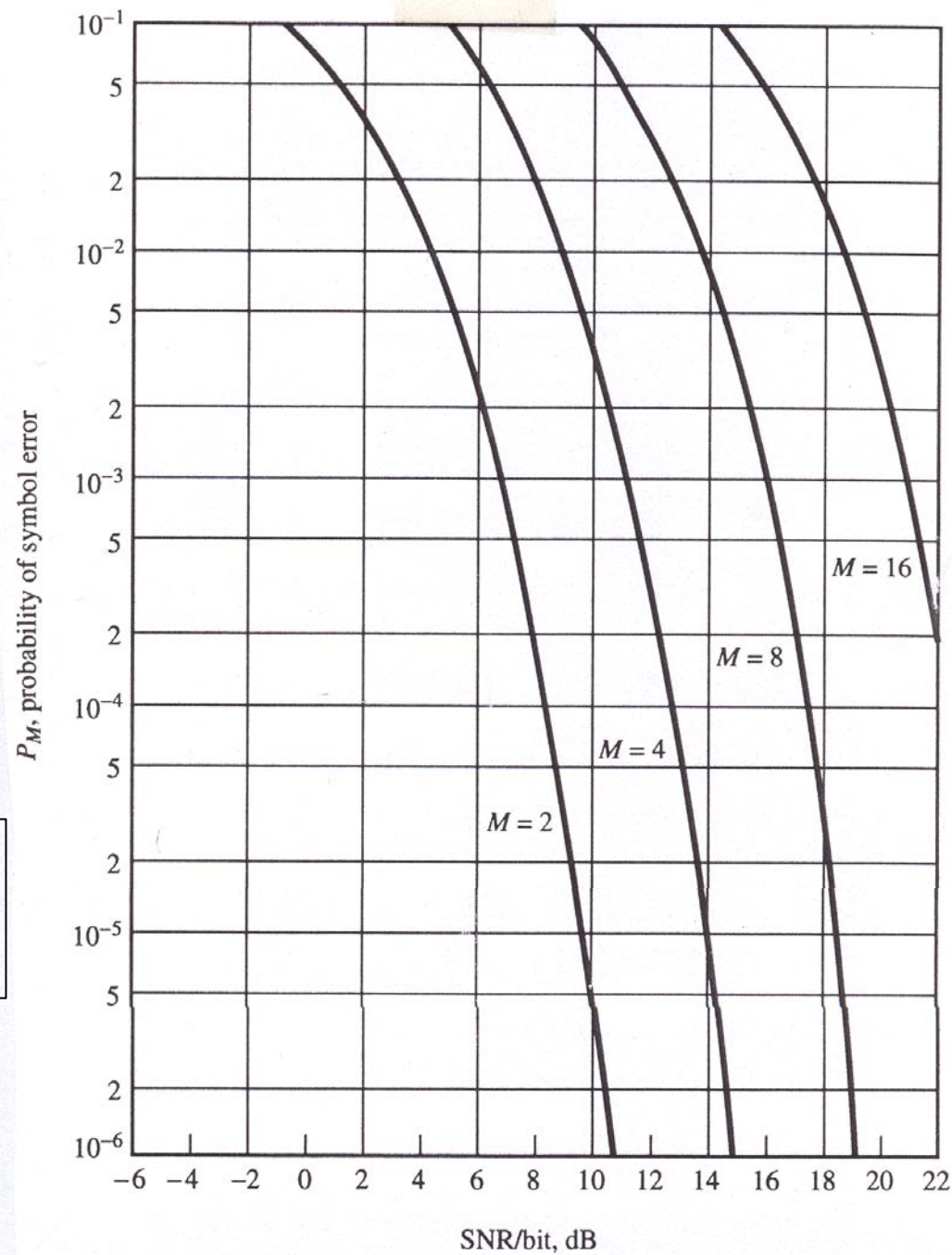
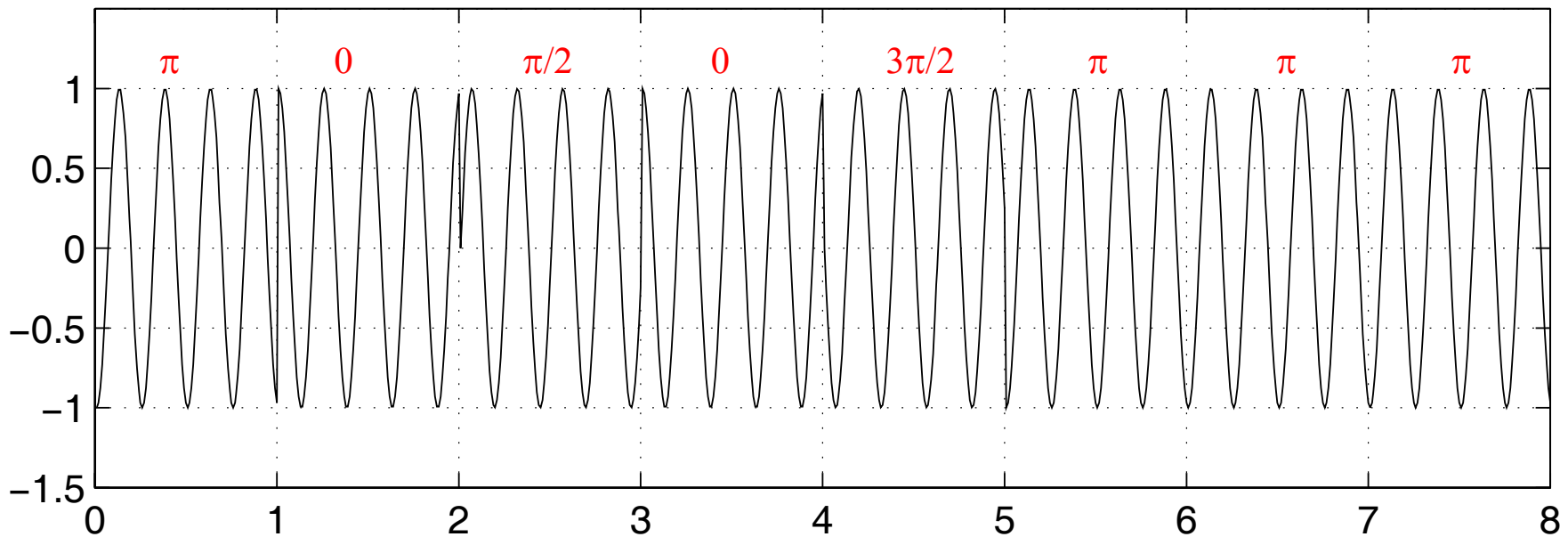
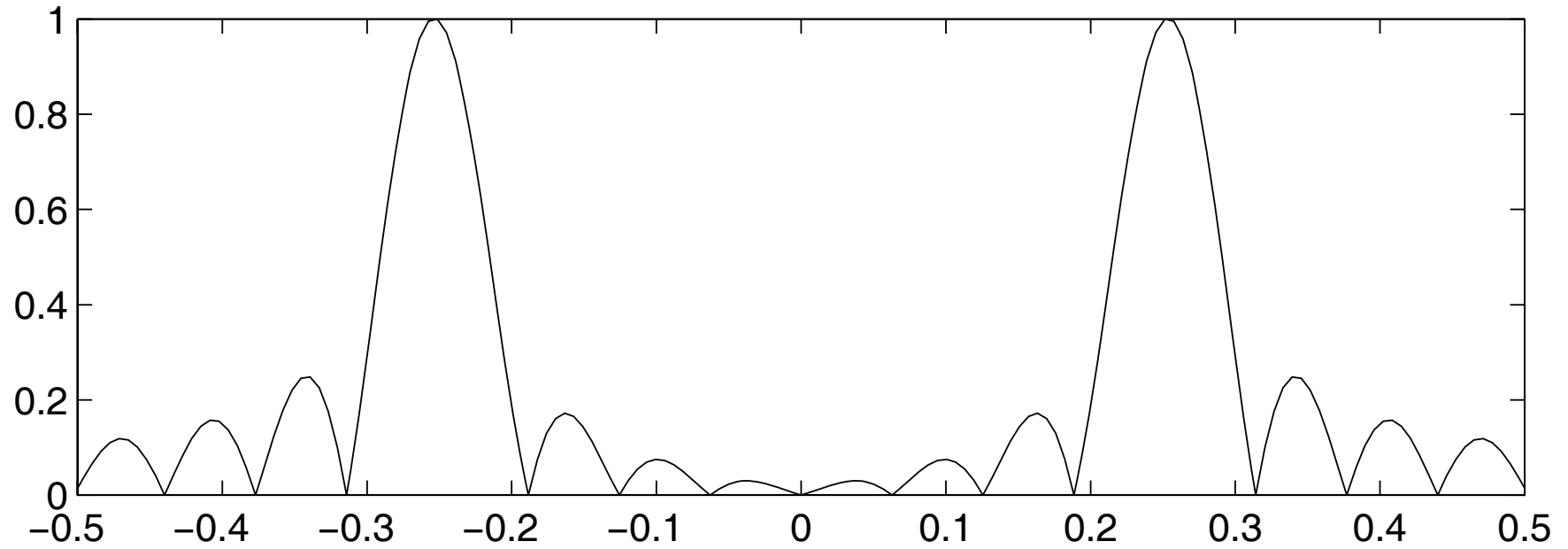


FIGURE 7.44. Probability of a symbol error for PAM.

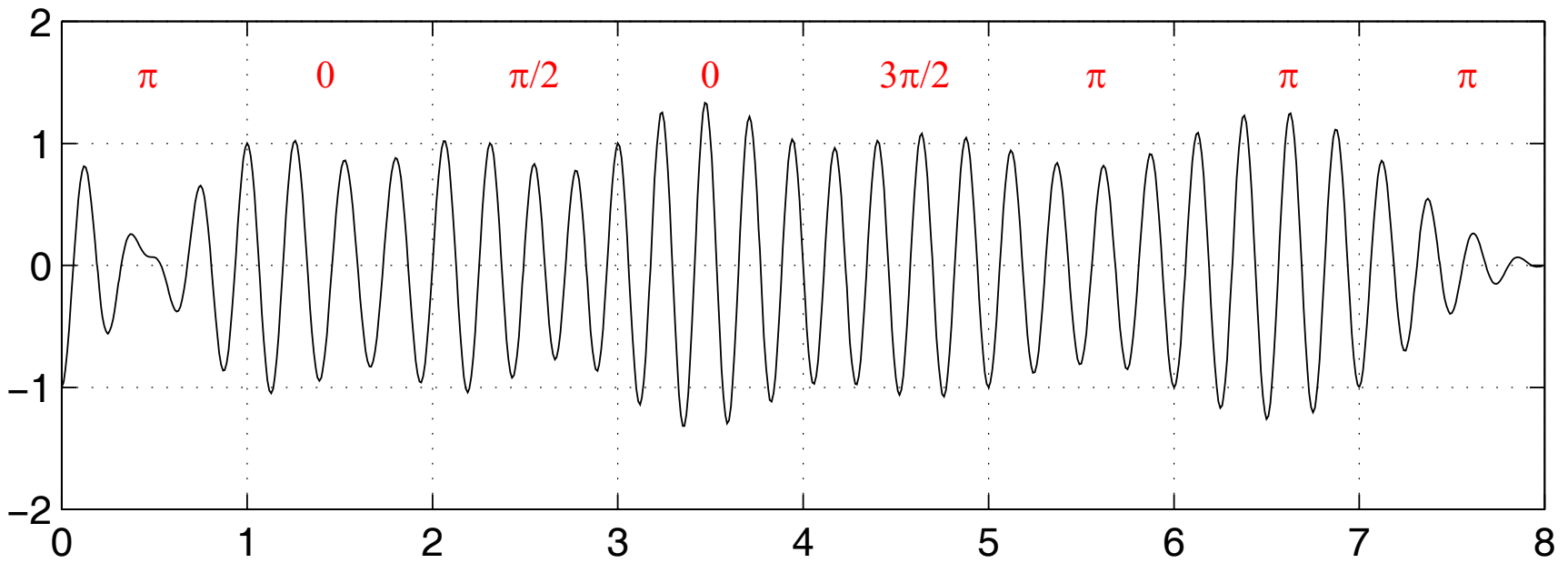
4 PSK con pulsos rectangulares



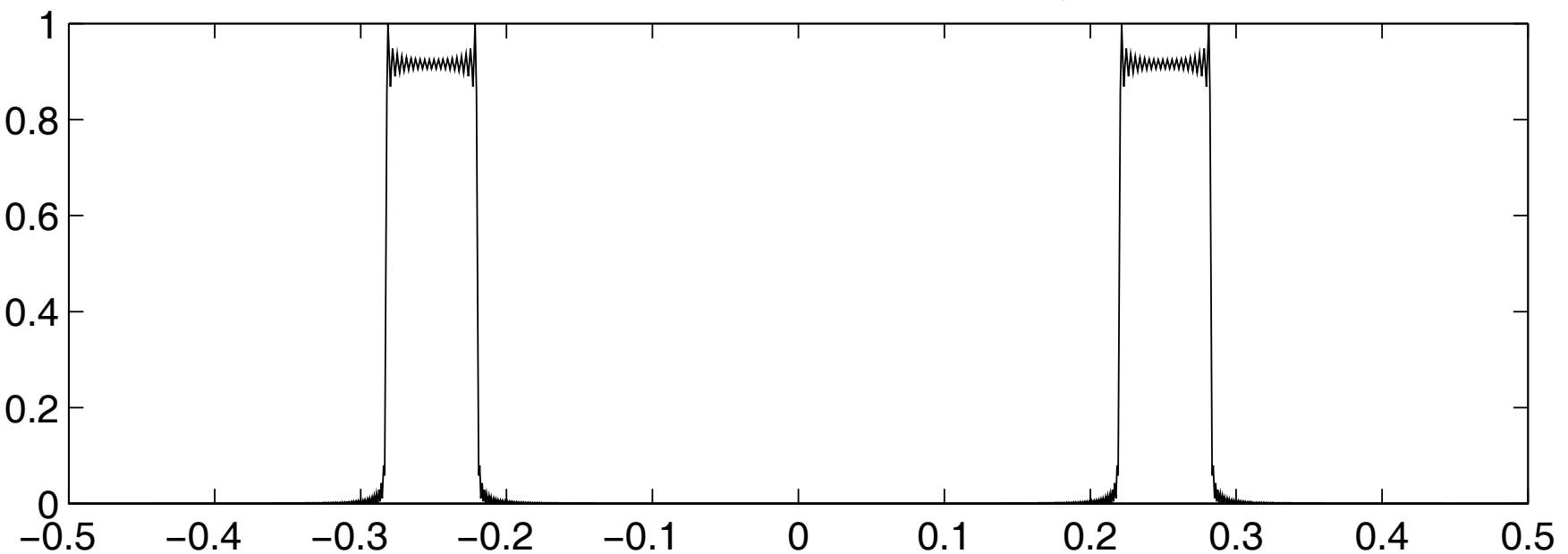
Espectro de 4 PSK pulsos rectangulares



4 PSK con pulsos de Nyquist



Espectro de 4 PSK con pulsos de Nyquist



Probabilidad de error de un sistema M-PSK

$$p(e) = Q\left(\sqrt{\frac{2E_b}{N_0}}\right) \quad M=2$$

$$p(e) \approx 2Q\left(\sqrt{\frac{2E_b}{N_0}}\right) \quad M=4$$

$$p(e) = 2Q\left(\sin\left(\frac{\pi}{M}\right)\sqrt{2\log_2(M)}\frac{E_b}{N_0}\right) \quad M > 4$$

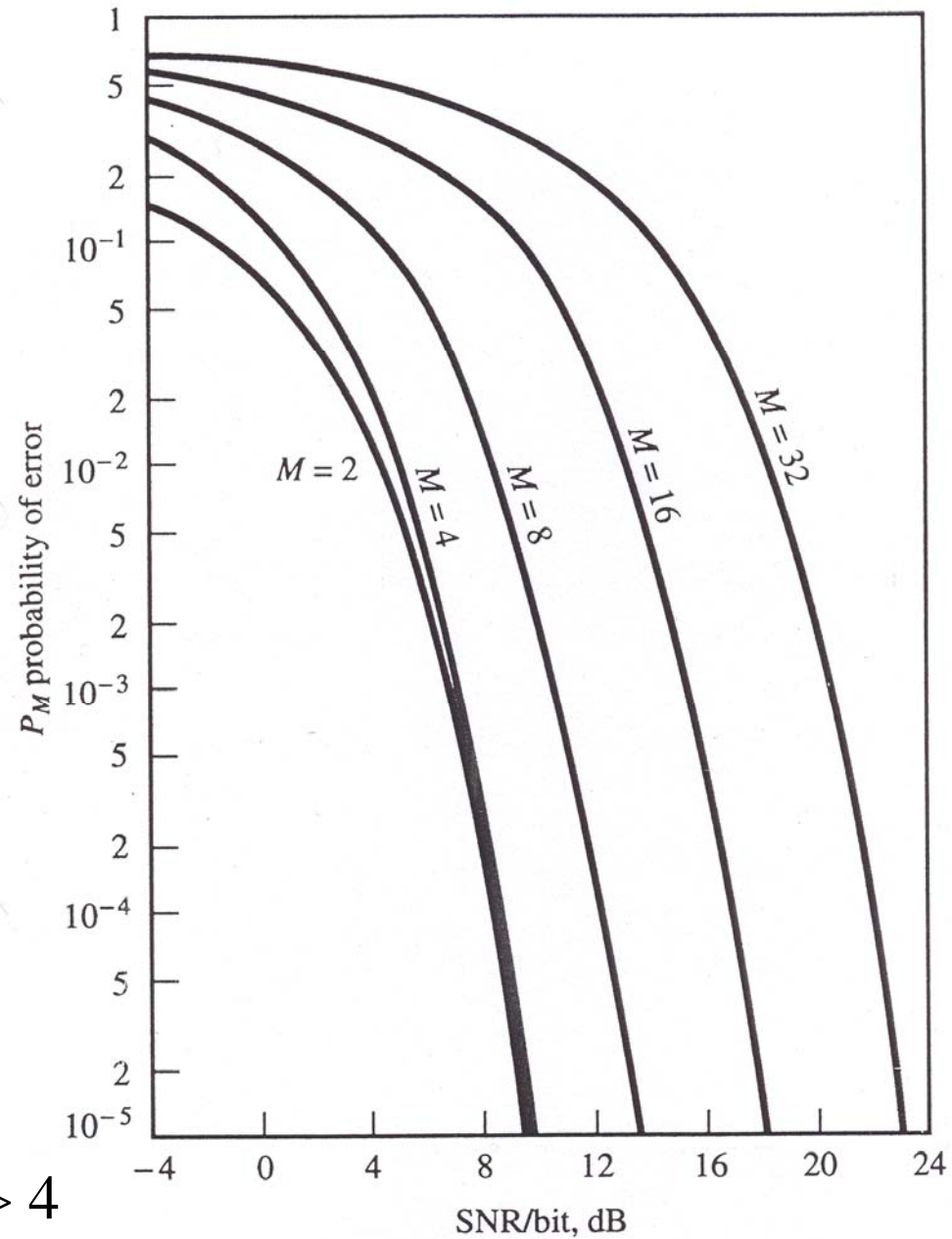
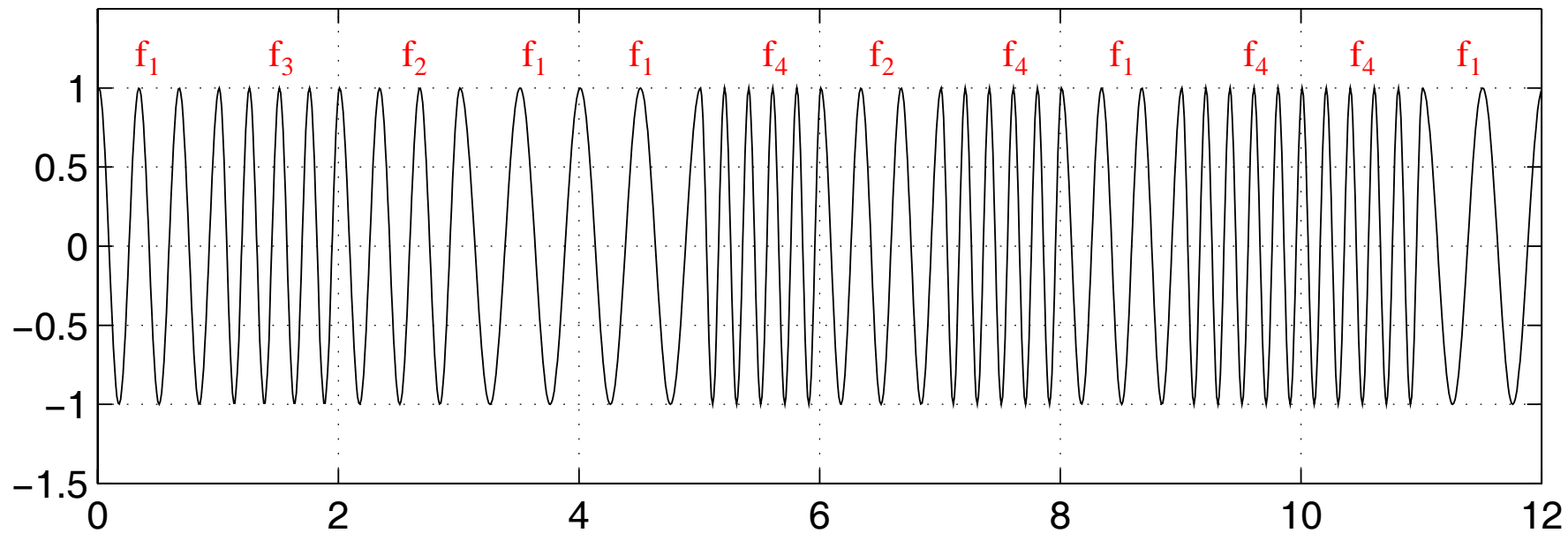
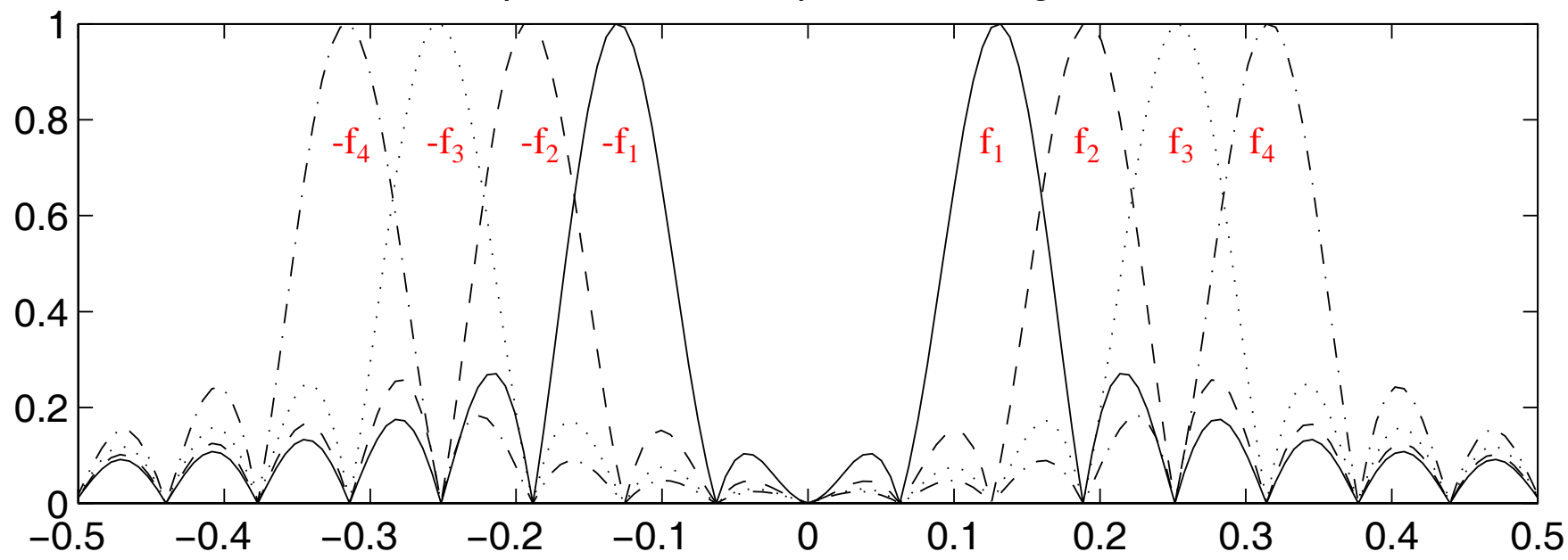


FIGURE 9.15. Probability of a symbol error for PSK signals.

4 FSK con pulsos rectangulares



Espectro de 4 FSK pulsos rectangulares



Probabilidad de error de un sistema M-FSK

