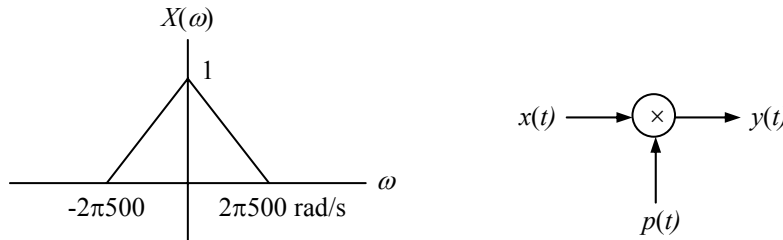
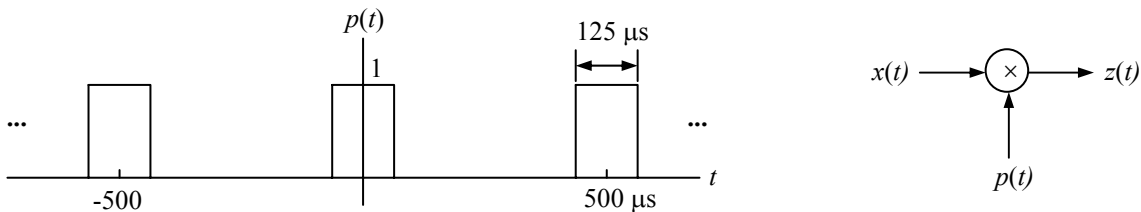


Read Sections 7.0 through 7.3 of Oppenheim and Willsky. All of the “Basic Problems With Answers” that deal with continuous-time sampling are excellent practice material. Also, do the following:

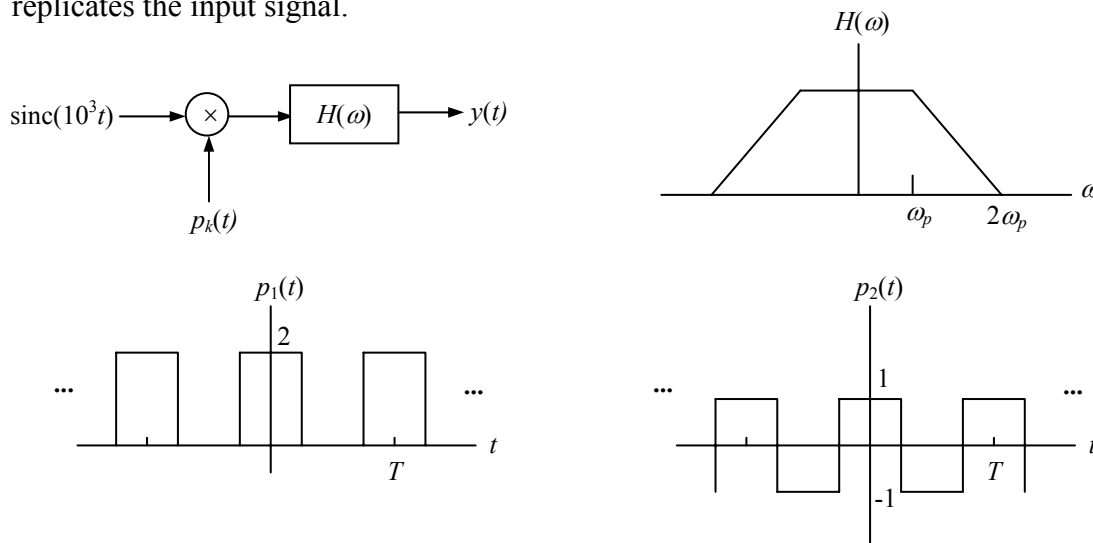
- O & W, problems 7.1, 7.2, 7.3.
- Suppose that a signal  $x(t)$  has spectrum  $X(\omega)$  shown below. Suppose  $x(t)$  is multiplied by the impulse train  $p(t) = \sum_{n=-\infty}^{\infty} \delta(t - n(500 \mu s))$ . Find and plot the spectrum  $Y(\omega)$  of the output  $y(t)$ .



- Suppose that the signal  $x(t)$  from the previous problem is multiplied by the pulse train  $p(t)$  shown. Find and plot the spectrum  $Z(\omega)$  of the output  $z(t) = x(t) p(t)$ .



- Consider the system below where the input signal is sampled, then filtered so that the output  $y(t)$  replicates the input signal.



- Which of  $p_1(t)$  or  $p_2(t)$  is suitable as the sampling signal? Explain your choice.
- Find values of  $T$  and  $\omega_p$  that will allow  $y(t)$  to replicate the input.