EE 233 Homework 4.

3-2. A signal $e(t)$ is sampled by an ideal sampler.

a. List the conditions under which $e(t)$ can be completely recovered from $e^*(t)$, i.e., the conditions under which no loss of information by the sampling process occurs.
b. State which of the conditions listed in a. can occur in a physical system. Recall that the sampling operation itself is not physically realizable.
c. Considering the answers in b., state why we can successfully employ systems that use sampling.

3-8. Find $E^*(s)$ for

$$E(s) = \frac{1 - e^{-Ts}}{s(s + 1)}$$

3-14.

a. A sinusoid with a frequency of 2 Hz is applied to a sampler/zero-order hold combination. That sampling rate is 10 Hz. List all frequencies present in the output that are less than 50 Hz.
b. Repeat a. if the input sinusoid has a frequency of 8 Hz.
c. The results of a. and b. are identical. Give three other frequencies, which are greater than 50 Hz, that yield the same results as a. and b.