1. The following signal:

$$x(t) = 2\cos(2\pi 400t) + 2\cos(2\pi 2000t)$$

is sampled at fs=5000samples/second. Sketch the magnitude of the spectrum of the output of each of the following samplers. Be sure to label all significant frequencies, amplitudes and areas.

   a. An idea sampler. Sketch from -2π2fs to 2π2fs.
   b. A sample-with-pulse with duty cycle $\frac{T}{T_s} = \frac{1}{4}$. Sketch from -2π4fs to 2π4fs.
   c. A sample-with-pulse with duty cycle $\frac{T}{T_s} = \frac{1}{2}$. Sketch from -2π4fs to 2π4fs.
   d. A sample-and-hold with duty cycle $\frac{T}{T_s} = 1$. Sketch from -2πfs to 2πfs.

2. Problem P-5.1 from Signal Processing First.
3. Problem P-5.2.
4. Problem P-5.3.
5. Problem P-5.9.