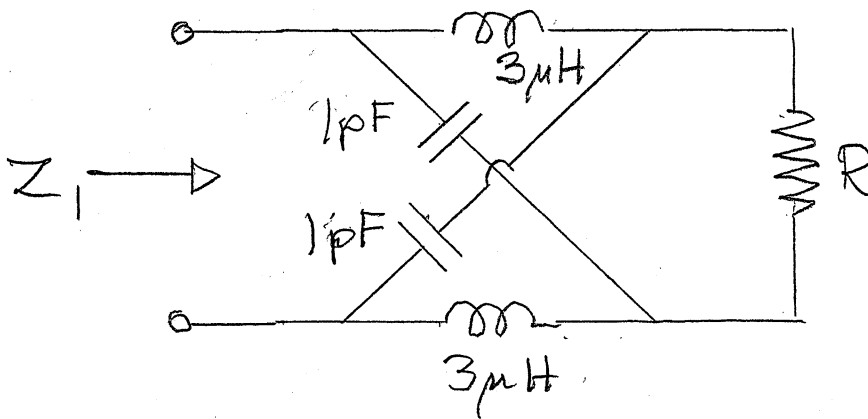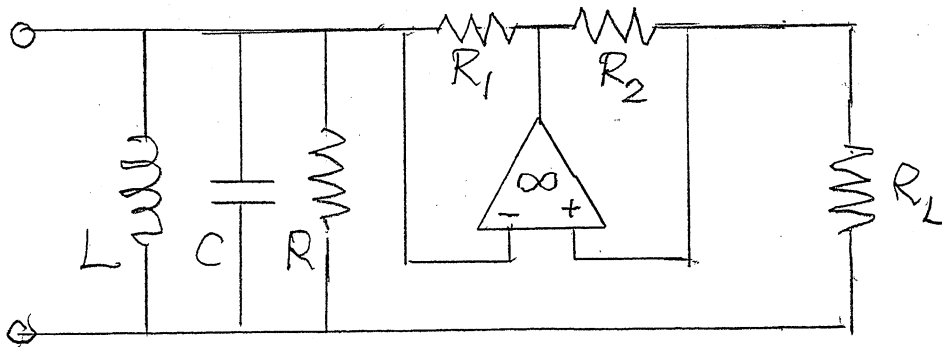1. In the terminated two-port shown below, the input impedance is Z_1.

   a. At what frequencies is $Z_1 = R$ for _all_ values of R?

   b. For what value of R does $Z_1 = R$ hold at _all_ frequencies? Why?

2. What is the input impedance of the circuit shown below? What are its possible applications?

3. (Extra credit) Find all node voltages in the circuit shown below.