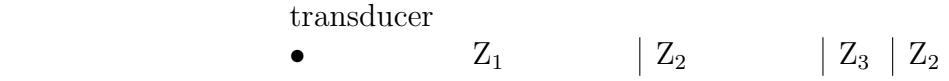
1. How does the ring down of the transducer affect axial resolution?

2. With a 50% bandwidth imaging pulse, show how axial resolution is related to frequency. How does that relationship change when the medium changes? Given what you've found, what are some limiting factors to the axial resolution?

3. If you have a 1cm square transducer, how might you improve lateral resolution in the far field?

4. Sketch the approximate axial pressure profile for a point source transducer. Sketch the approximate axial pressure profile for a 2cm square transducer with 5 samples... with 9 samples... with more until you see what's going on.

5. Draw the approximate pulses resulting from the following drawing. Next draw the resulting pulses if the transducer was twice as thick. Consider (very generally – no need to make specific calculations) resolution and attenuation. Z_1 = 4.0 x 10^6 kg/m^2s, Z_2 = 1.6 x 10^6 kg/m^2s, Z_3 = 7.8 x 10^6 kg/m^2s.



6. All other things alike, which interface would yield a stronger signal, 1:2 or 1:3? Material 1 = average soft tissue. Material 2 has density 1000 kg/m^3 and velocity 2000 m/s. Material 3 has density 1200 kg/m^3 and bulk modulus 2 x 10^9 kg/s^2m. Calculate the reflection coefficients.