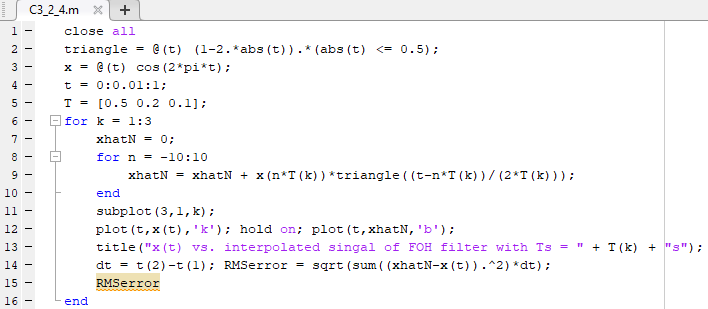
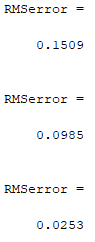
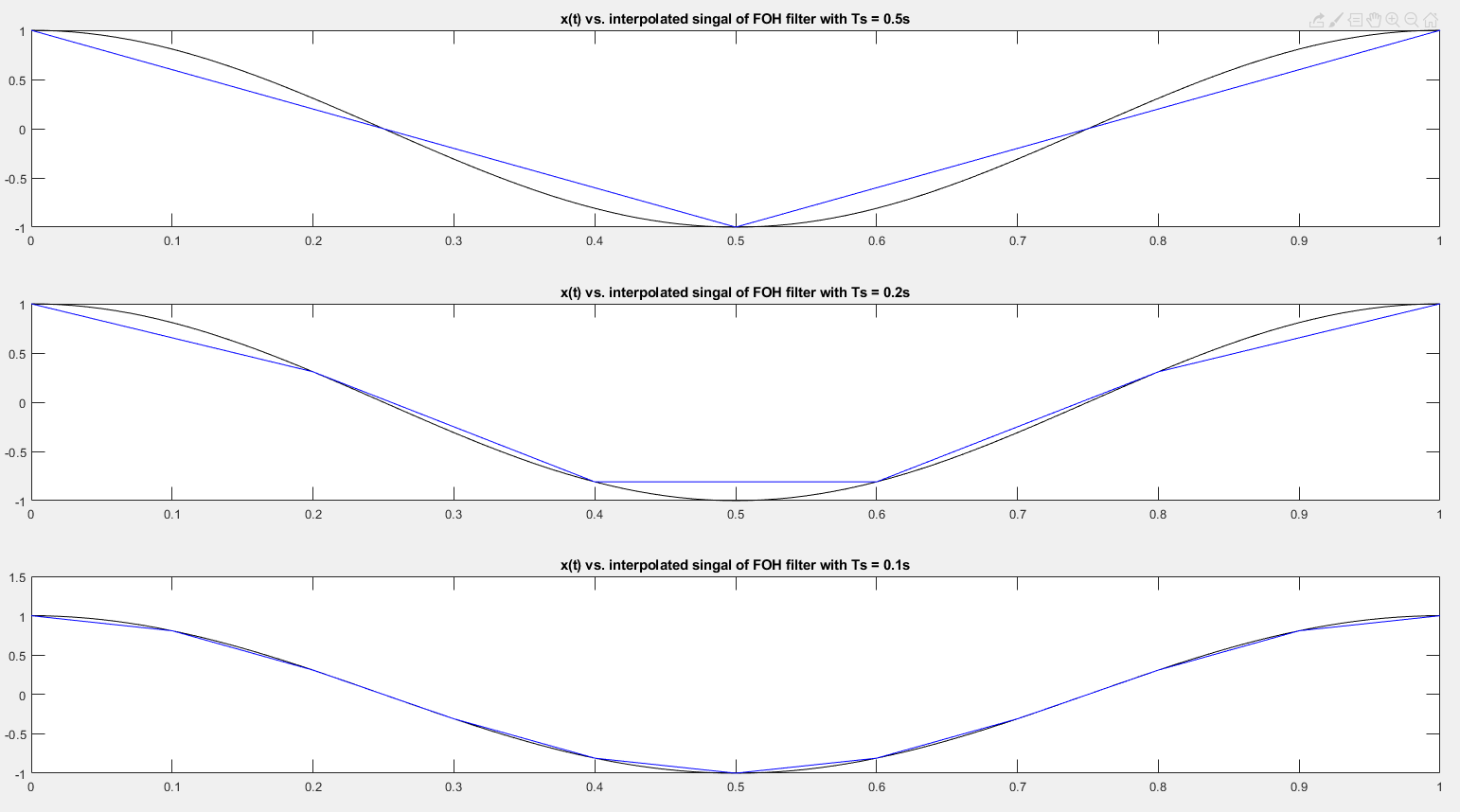
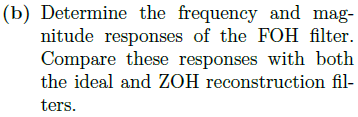


a) will be scaled impulses of separated by the sampling period . Then,

Stealing your code from pg. 166 in the textbook, we can see what this looks like in MATLAB with sampling periods of 0.5s, 0.2s and 0.1s



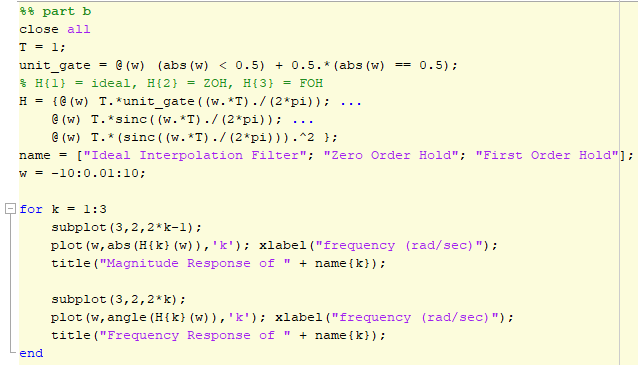


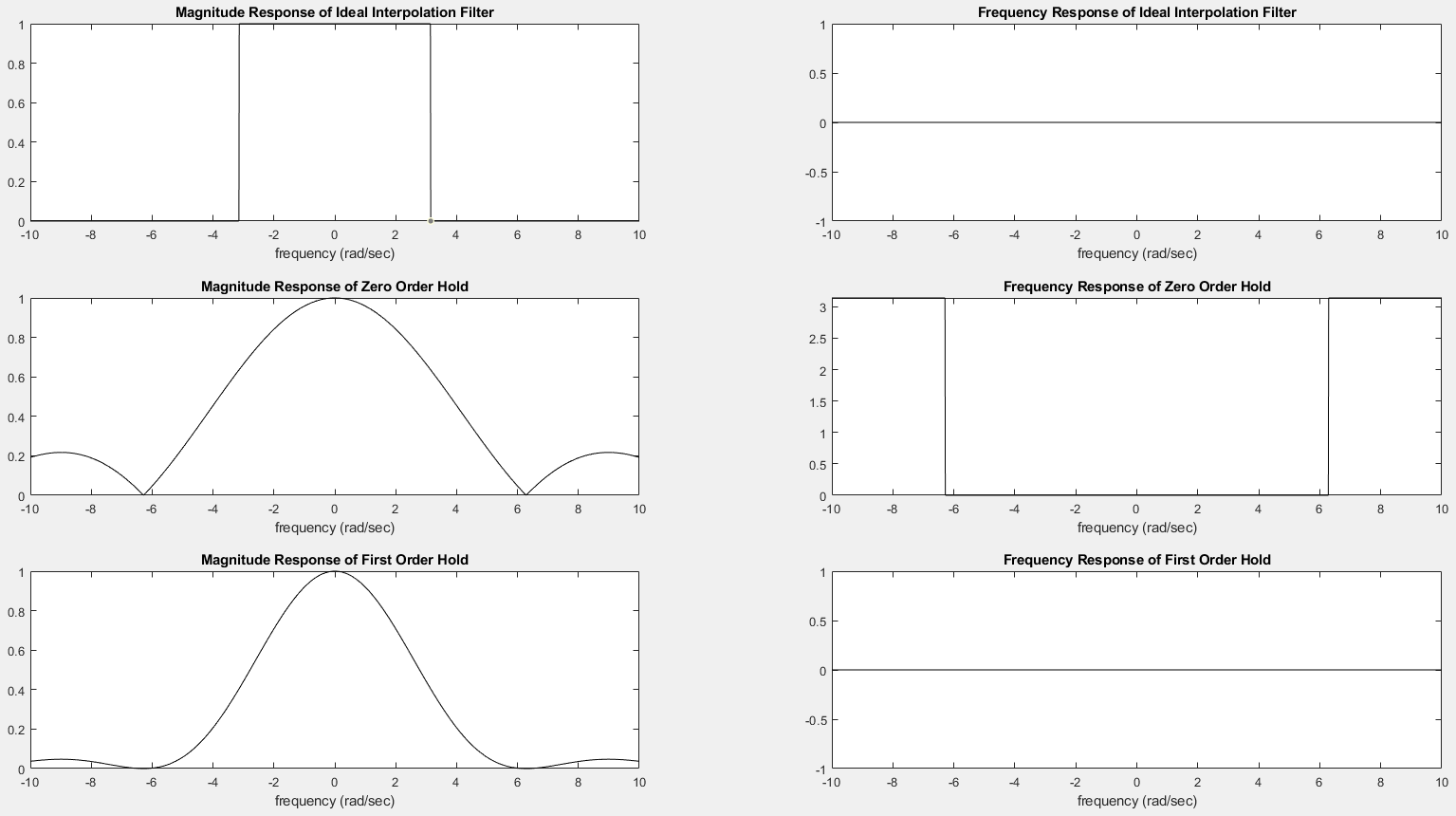
Using transform pair: 

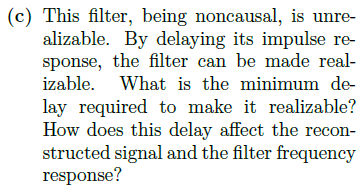
Then, where

We can steal the frequency domain equations for ZOH and ideal reconstruction filters from pg. 167 and 164 respectively

Then in MATLAB,

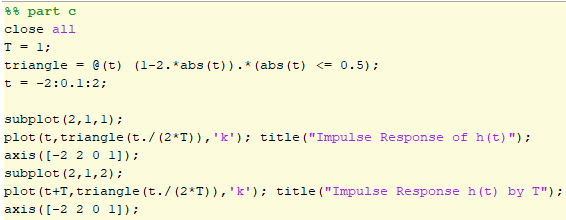


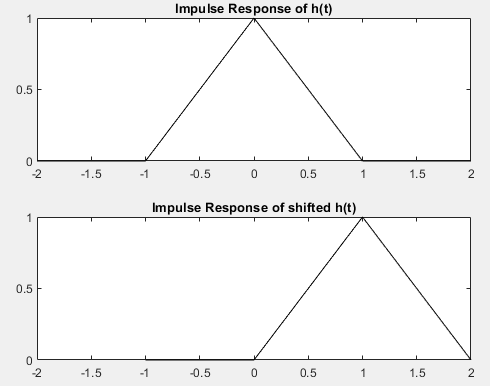




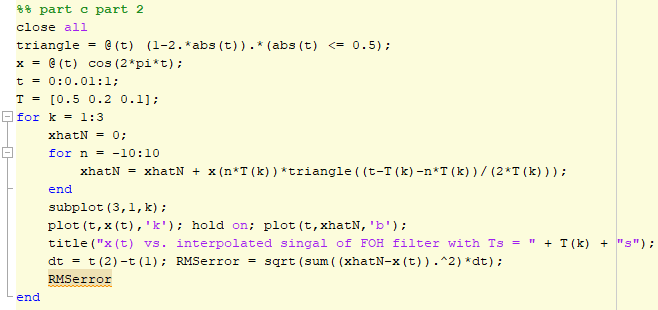
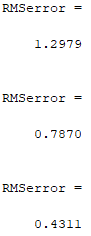
Currently, the impulse response is a Triangle model, centered on t = 0, with limbs that go out to from -T to T. Then the minimum delay necessary to make this filter realizable (causal) is one period “T”.

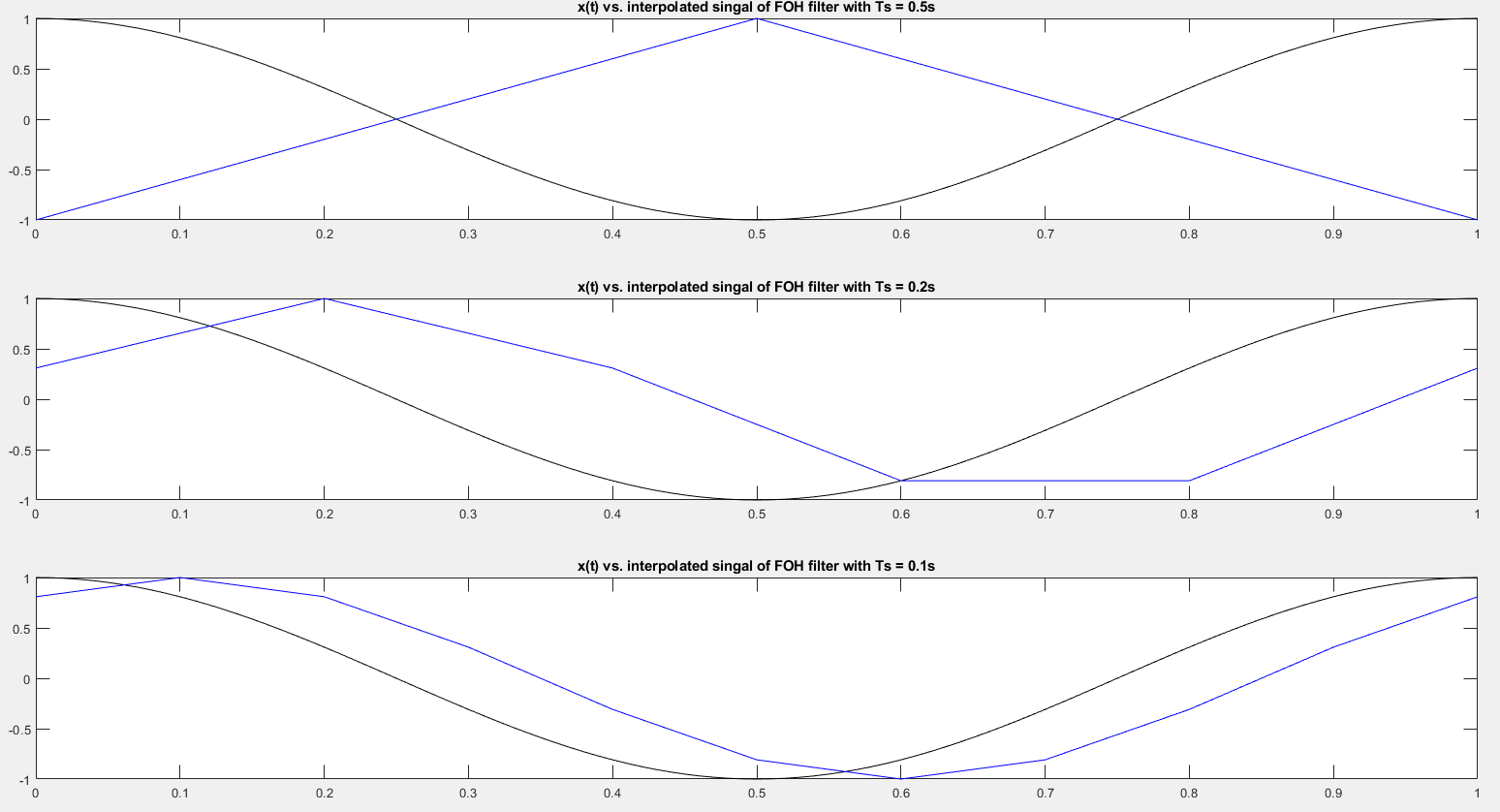
If we delay by one sampling period it will be identical to the FOH except that the output will be delayed by one sample period. In MATLAB if we let T = 1,

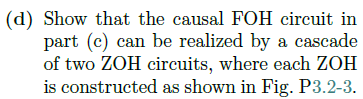




Or in MATLAB using our same code from part a,

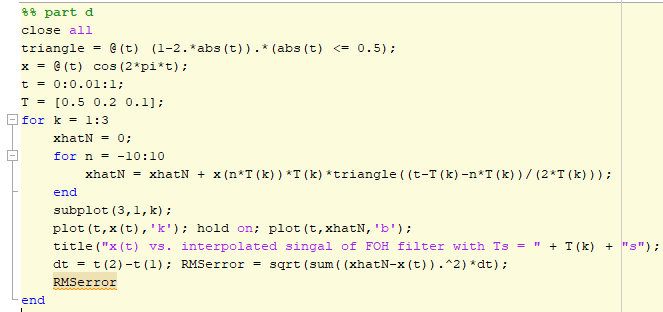


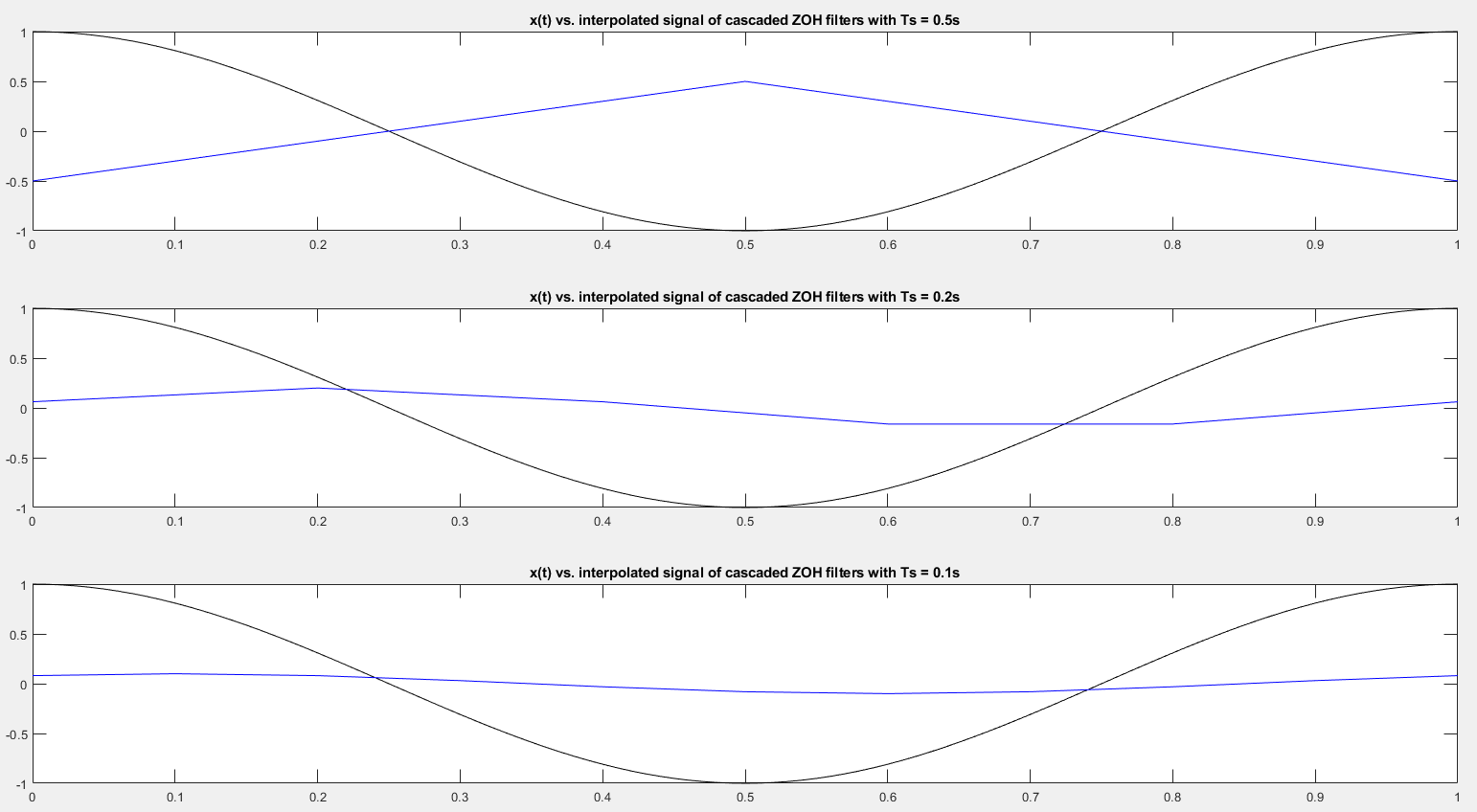


Cascaded systems multiply in the frequency domain, so:

From the FOH transform pair, we know that in the time-domain this is:

This will be the same as FOH circuit, except scaled by T. In our case if we use the same then in MATLAB:



****

These are the same values as our FOH filter except scaled by T.