# Optimization

## Assignment 4

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### Q1

Given

Show that the frequency response can be written as:

Where

and

Proof:

The frequency response:

Which can also be written as:

Where

Q.E.D.

### Q2

Given a type I FIR filter with the response of:

Assume we subsample at

We then get:

With weights

we can write the error at each sampled frequency as:

With our constraint we get:

where

which leads us to