4. (5 points) Evaluate the convolution of the two sequences $h(n)=(0.4)^n u(n)$ and $x(n)=2.1^n u(-n)$ by using the z-transform.

5. (6 points) Find the inverse of each of the following z-transforms:

(a) (1 point) $X(z) = 2+1.5(z^2 + z^{-2})\ \ 0<|z|<\infty$

(b) (1 point) $X(z) = \dfrac{1}{1-\frac{1}{2}z^{-1}} + \dfrac{3}{1-\frac{1}{3}z^{-1}}\ \ |z|>\frac{1}{2}$

(c) (2 point) $X(z) = \dfrac{2}{1+4z^{-1}+3z^{-2}}\ \ |z|>3$

(d) (2 points) $X(z) = \dfrac{1+\frac{1}{4}z^{-1}}{\left(1+\frac{1}{2}z^{-1}\right)^2}\ \ |z|>\frac{1}{2}$

6. (5 points) A signal $y(n)$ contains a primary signal, $x(n)$, plus two echoes:

$$y(n) = x(n) + \tfrac{1}{3}x(n-n_d) + \tfrac{1}{6}x(n-2n_d)$$

Find a *realizable* filter that will recover $x(n)$ from $y(n)$.