1. Find the DTFT of x[n]=
   a. $6\,\delta[n] - 2\,\delta[n+1]$
   b. $2^{-|n|}$

2. Find the IDTFT of
   a. $X(e^{j\omega}) = \begin{cases} 1, & -\frac{\pi}{4} \le \omega \le \frac{\pi}{4} \\ 0, & \text{elswhere over } -\pi < \omega < \pi \end{cases}$

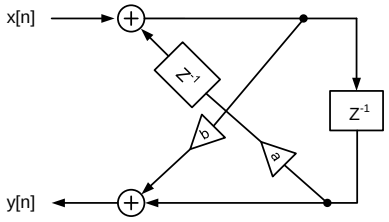
   b. $X(e^{j\omega}) = 6\cos(2\omega)$

3. For some $x[n]$, $X[k] = [6\ \underset{\uparrow}{2}\ 5\ 5\ 2]$
   a. How long is x[n]?
   b. What is $\sum x[n]$?
   c. What sample in the DFT corresponds to frequency $\omega = 0.4\pi$?
   d. If the sampling frequency from which x[n] is taken is 60Hz, which sample of the DFT corresponds to 24Hz?
   e. What kind of symmetry does x[n] (not X[k]) have?

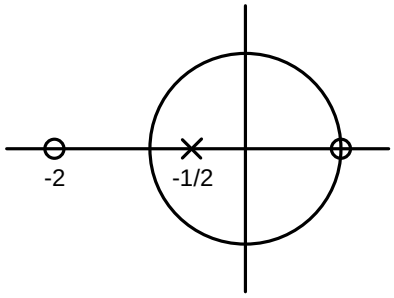
4. Find the z transform of $x[n] = (-0.3)^n u[n-2]$

5. Find the inverse z transform of $\frac{z+z^{-1}}{1+0.8z^{-1}+0.2z^{-2}}$

6. Find H(z) of this system to the right



7. Given the pole zero diagram to the right
   a. Is the causal filter BIBO stable?
   b. FIR or IIR?
   c. Linear phase?
   d. LP, HP, BP, BS, or other?
   e. What is the response to x[n] = 5?



8. Using Matlab's filterDesigner, find h[n] of a linear phase filter used in a system with a 1kHz sampling frequency that passes frequencies ≤ 100Hz with about a ± 10% variance from unity gain, and attenuates frequencies ≥ 250Hz by about 90%.