PROBLEM:

For each $H(z)$, determine all of the poles and zeros, including those at $z = 0$ and $z = \infty$.

System Function, $H(z)$

(a) $H(z) = \dfrac{1 - z^{-1}}{1 + 2z^{-1}}$

ANS =

(b) $H(z) = \dfrac{z^{-2}}{1 - 0.81z^{-2}}$

ANS =

(c) $H(z) = \dfrac{1}{1 + 0.81z^{-2}}$

ANS =

(d) $H(z) = (1 - e^{j\pi/4}z^{-1})(1 - e^{-j\pi/4}z^{-1})$

ANS =

(e) $H(z) = \dfrac{1}{1 - 2z^{-1}}$

ANS =

Poles and Zeros

1. pole at $z = -2$, zero at $z = 0$
2. pole at $z = 2$, zero at $z = 0$
3. poles at $z = \pm 0.9$, zeros at $z = \infty$
4. pole at $z = \frac{1}{2}$, no zeros
5. pole at $z = -\frac{1}{2}$, zero at $z = 0$
6. pole at $z = -2$, zero at $z = 1$
7. poles at $z = 0$, zeros at $z = e^{\pm j\pi/4}$
8. poles at $z = \pm j0.9$, zeros at $z = 0$