

## 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)  $H(z) = \frac{1}{1 + 0.64z^{-2}}$

**ANS =**

(b)  $H(z) = \frac{1}{1 - 0.64z^{-2}}$

**ANS =**

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

**ANS =**

(d)  $H(z) = (1 - e^{j0.1\pi}z^{-1})(1 - e^{-j0.1\pi}z^{-1})$

**ANS =**

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

**ANS =**

### Poles and Zeros

1. pole at  $z = -\frac{1}{2}$ , zero at  $z = 0$
2. pole at  $z = -2$ , zero at  $z = 1$
3. poles at  $z = \pm j0.8$ , zeros at  $z = 0$
4. pole at  $z = 2$ , no zeros
5. pole at  $z = 2$ , zero at  $z = 0$
6. pole at  $z = -\frac{1}{2}$ , zero at  $z = \infty$
7. poles at  $z = 0$ , zeros at  $z = e^{\pm j0.1\pi}$
8. poles at  $z = \pm 0.8$ , zeros at  $z = 0$