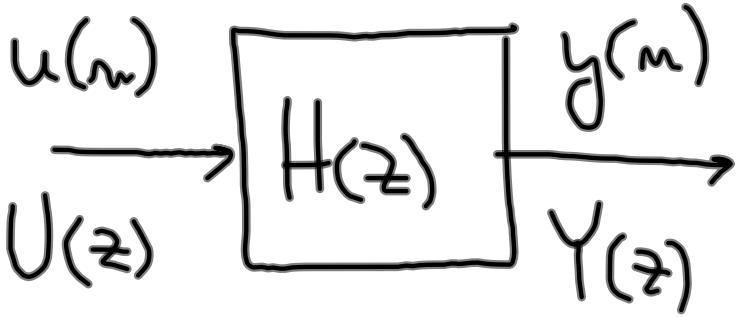
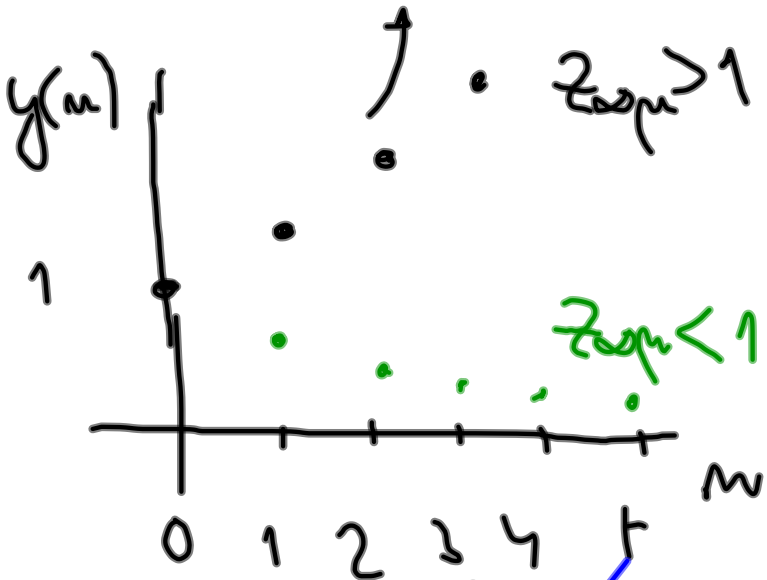


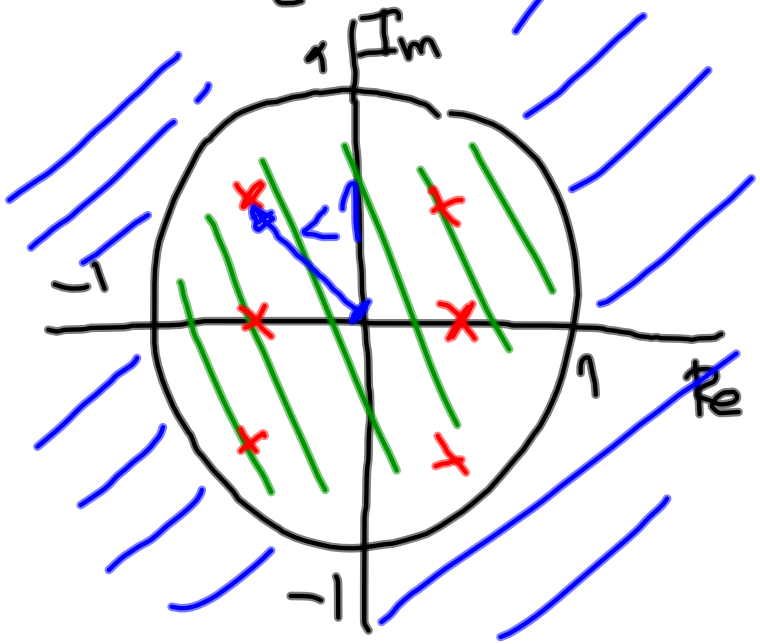
$$H(z) = \sum_{\mu=1}^{N} \frac{z}{z - z_{\infty\mu}}$$

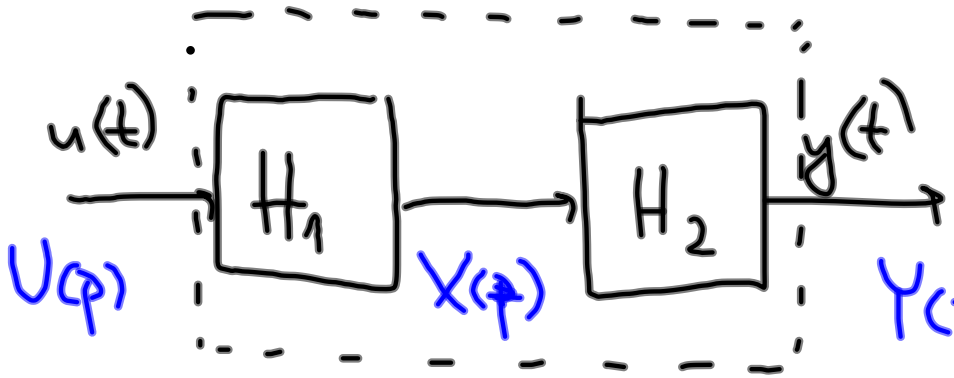
$(z_{\infty\mu})^n$

< 1

> 0



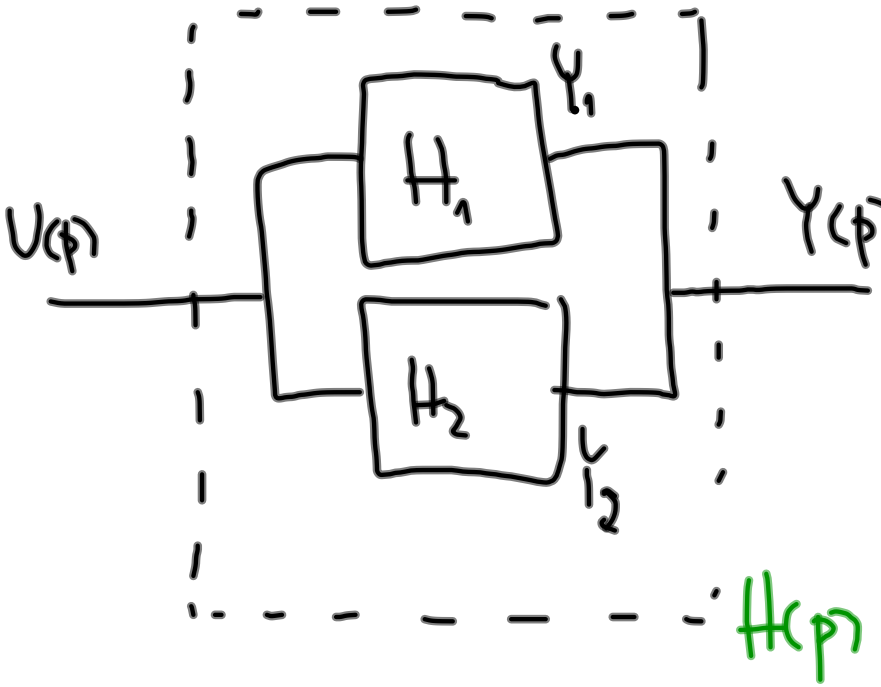




$$H_1(p) = \frac{X(p)}{U(p)}$$

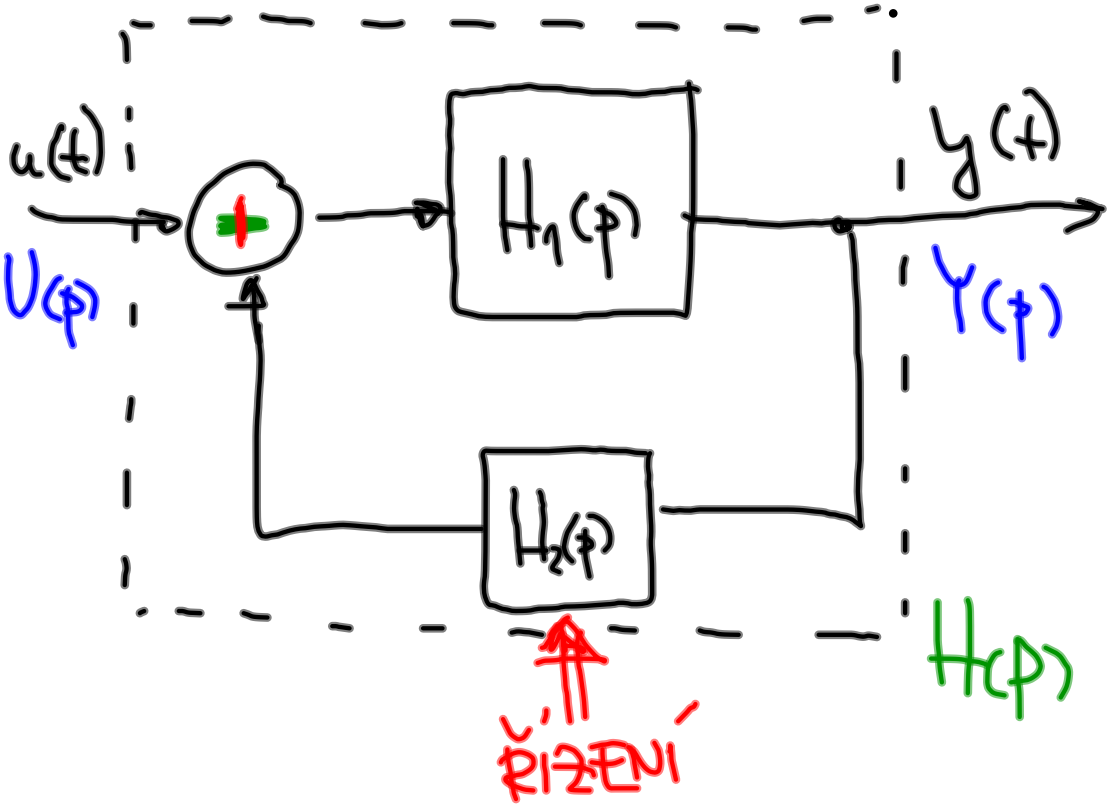
$$H_2(p) = \frac{Y(p)}{X(p)}$$

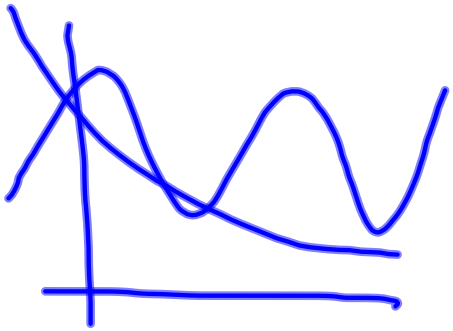
$$H(p) = H_1(p) \cdot H_2(p)$$

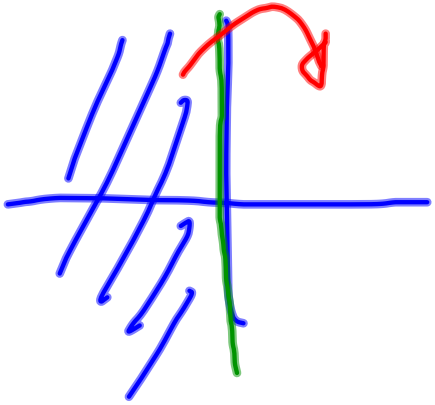


$Y(p) = Y_1(p) + Y_2(p)$

$$H(p) = H_1(p) + H_2(p)$$







$$H(p) = \frac{H_1(p)}{1 + H_1(p)H_2(p)}$$

$$z\cdot\left[z\cdot X_1(z)-z\right]+z\cdot a=a^2X_1(z)$$

$$z^2X_1(z)-z^2+z\cdot a-a^2X_1(z)=0$$

$$X_1(z)\left[z^2-a^2\right]=z^2-z\cdot a$$

$$=Y(z)=\frac{z(z-a)}{z^2-a^2}=\frac{z(z-a)}{(z+a)(z-a)}$$

$$Y(z)=\frac{z}{z+a}\Rightarrow y(n)=(-a)^n$$

$$x_1(n+1) = x_2(n)$$
$$x_2(n+1) = a^2 x_1(n)$$

$$y(n) = x_1(n)$$

$$\mathbf{x}(n+1) = \mathbf{A}\,\mathbf{x}(n) + \mathbf{B}\cdot u(n)$$

$$y(n) = \mathbf{C}\,\mathbf{x}(n) + \mathbf{D}\cdot u(n)$$

$$\mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

$$\mathbf{A} = \begin{bmatrix} 0 & 1 \\ a^2 & 0 \end{bmatrix} \quad \mathbf{B} = \emptyset$$

$$\mathbf{C} = \begin{bmatrix} 1 & 0 \end{bmatrix} \quad \mathbf{D} = 0$$

$$h(t) = e^{at} \cdot \sin bt \qquad u(t) = e^{-at}$$

$$Y(p) \cancel{H(p)} = \frac{p-a}{(p-a)^2 + b^2} \cdot \frac{1}{p+a} \qquad y(t) = ?$$

$$H(p) = \frac{Y(p)}{U(p)}$$

$$\Downarrow$$

$$Y(p) = H(p) \cdot U(p)$$

$$p^2 - 2ap + a^2 + b^2$$

$$p_{01,2} = \frac{2a \pm \sqrt{4a^2 - 4a^2 - 4b^2}}{2}$$

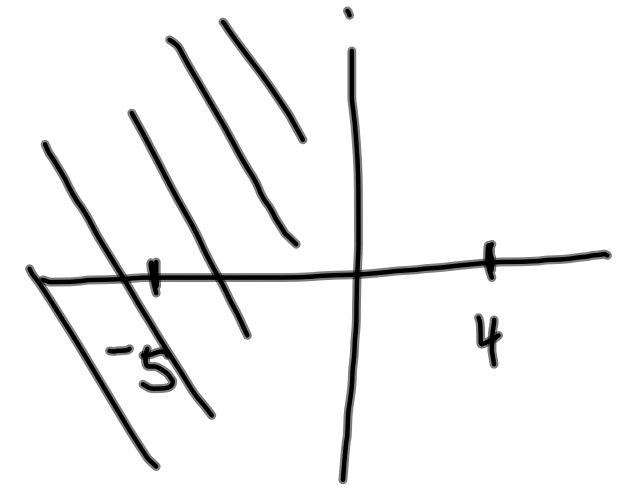
$$H(p) = \frac{1}{(p-a)}$$

$$Y(p) = H(p) \cdot U(p) = \frac{1}{(p-a)} \cdot U(p)$$

$$Y(p)[p-a] = U(p)$$

$$pY(p) - aY(p) = U(p)$$

$$y'(t) - ay(t) = U(t)$$



$u(n)$: $u(k) = u(k+4)$

$u(0) = 1$

$u(1) = 2$

$u(2) = -2$

$u(3) = -1$

$$U(z) = z^4 U(z) - z^4 u(0) - z^3 u(1) - z^2 u(2) - z u(0)$$