Bode alaptagok

BHM 2008
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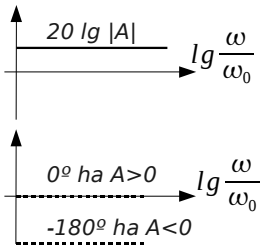
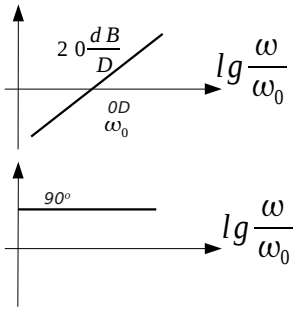
$$Y(j\omega)=A$$
$$Y(s)=A$$



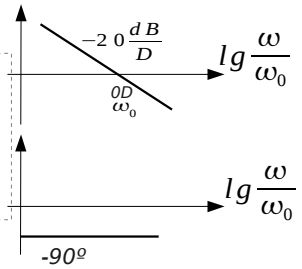
$$Y(j\omega)=\frac{j\omega}{\omega_0}$$
$$Y(j\omega)=j\omega T_0$$
$$Y(s)=\frac{s}{\omega_0}$$
$$Y(s)=s\,T_0$$

$$\omega_0=\frac{1}{T_0}$$
$$T_0=\frac{1}{\omega_0}$$



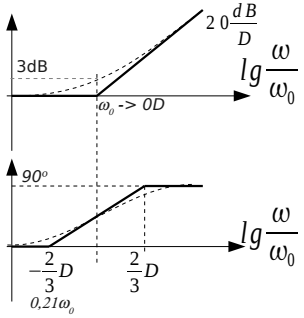
$$Y(j\omega)=\frac{1}{j\frac{\omega}{\omega_0}}=\frac{\omega_0}{j\omega}$$
$$Y(j\omega)=\frac{1}{j\omega T_0}$$
$$Y(s)=\frac{1}{\frac{s}{\omega_0}}=\frac{\omega_0}{s}$$
$$Y(s)=\frac{1}{sT_0}$$

$$\omega_0=\frac{1}{T_0}$$
$$T_0=\frac{1}{\omega_0}$$



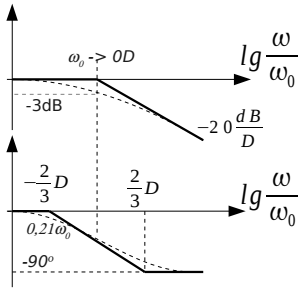
$$Y(j\omega)=1+j\frac{\omega}{\omega_0}$$
$$Y(j\omega)=1+j\omega T_0$$
$$Y(s)=1+\frac{s}{\omega_0}$$
$$Y(s)=1+s\,T_0$$

$$\omega_0=\frac{1}{T_0}$$
$$T_0=\frac{1}{\omega_0}$$



$$Y(j\omega)=\frac{1}{1+j\frac{\omega}{\omega_0}}$$
$$Y(j\omega)=\frac{1}{1+j\omega T_0}$$
$$Y(s)=\frac{1}{1+\frac{s}{\omega_0}}$$
$$Y(s)=\frac{1}{1+s\,T_0}$$

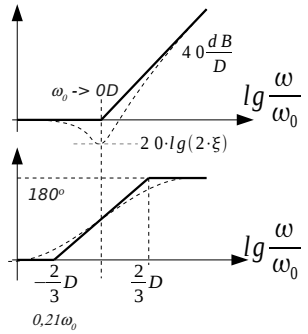
$$\omega_0=\frac{1}{T_0}$$
$$T_0=\frac{1}{\omega_0}$$



$$Y(j\omega)=1+2\,\xi\,j\frac{\omega}{\omega_0}+\left(j\frac{\omega}{\omega_0}\right)^2$$
$$Y(j\omega)=1+2\,\xi\,j\omega T_0+\left(j\omega T_0\right)^2$$
$$Y(s)=1+2\,\xi\frac{s}{\omega_0}+\left(\frac{s}{\omega_0}\right)^2$$
$$Y(js)=1+2\,\xi s\,T_0+\left(s\,T_0\right)^2$$

$$\omega_0=\frac{1}{T_0}$$
$$T_0=\frac{1}{\omega_0}$$

ha $\xi<1$



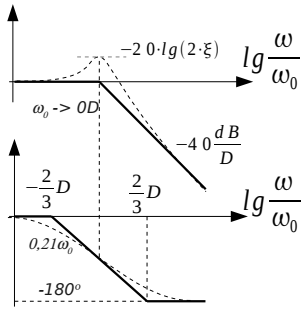
ha $\xi>1$

$$Y(j\omega)=\left(1+j\frac{\omega}{\omega_1}\right)\cdot\left(1+j\frac{\omega}{\omega_2}\right)\qquad Y(s)=\left(1+\frac{s}{\omega_1}\right)\cdot\left(1+\frac{s}{\omega_2}\right)$$
$$Y(j\omega)=\left(1+j\omega T_1\right)\cdot\left(1+j\omega T_2\right)\qquad Y(s)=\left(1+s\,T_1\right)\cdot\left(1+s\,T_2\right)$$

$$Y(j\omega)=\frac{1}{1+2\,\xi\,j\frac{\omega}{\omega_0}+\left(j\frac{\omega}{\omega_0}\right)^2}$$
$$Y(j\omega)=\frac{1}{1+2\,\xi\,j\omega T_0+\left(j\omega T_0\right)^2}$$
$$Y(s)=\frac{1}{1+2\,\xi\frac{s}{\omega_0}+\left(\frac{s}{\omega_0}\right)^2}$$
$$Y(js)=\frac{1}{1+2\,\xi s\,T_0+\left(s\,T_0\right)^2}$$

$$\omega_0=\frac{1}{T_0}$$
$$T_0=\frac{1}{\omega_0}$$

ha $\xi<1$



ha $\xi>1$

$$\omega_1=\omega_0\cdot\left(\xi-\sqrt{\xi^2-1}\right)\qquad \omega_2=\omega_0\cdot\left(\xi+\sqrt{\xi^2-1}\right)$$

$$T_1=\frac{T}{\xi-\sqrt{\xi^2-1}}\qquad T_2=\frac{T}{\xi+\sqrt{\xi^2-1}}$$

$$Y(j\omega)=\frac{1}{1+j\frac{\omega}{\omega_1}}\cdot\frac{1}{1+j\frac{\omega}{\omega_2}}\qquad Y(s)=\frac{1}{1+\frac{s}{\omega_1}}\cdot\frac{1}{1+\frac{s}{\omega_2}}$$
$$Y(j\omega)=\frac{1}{1+j\omega T_1}\cdot\frac{1}{1+j\omega T_2}\qquad Y(s)=\frac{1}{1+s\,T_1}\cdot\frac{1}{1+s\,T_2}$$