| $H(s) = A$ | $|H(s)| = A$ | $\phi_H(s) = 0^\circ$ |
|---|---|---|
| **Simple Gain** | $H(s) = \frac{A}{s}$ | $|H(s)| = 0^\circ$ |
| $H(s) = A$ | $\omega_o = A$ | $1 - 20\text{dB/dec}$ |
| Pole at Zero | $\omega_o = A$ | $\omega = \omega_o$ |
| $H(s) = As$ | $\omega_o = \frac{A}{s}$ | $1 + 20\text{dB/dec}$ |
| Zero at Zero | $\omega_o = \frac{A}{s}$ | $\omega = \omega_o$ |
| $H(s) = \frac{A}{1 + \frac{s}{\omega_o}}$ | $|H(s)| = 3\text{dB}$ | $\omega_o = 3\text{dB}$ |
| Pole at $\omega_o$ | $\omega_o = \frac{A}{s}$ | $|H(s)| = 3\text{dB}$ |
| $H(s) = A \left(1 + \frac{s}{\omega_o}\right)$ | $|H(s)| = 3\text{dB}$ | $\omega_o = 3\text{dB}$ |
| Zero at $\omega_o$ | $\omega_o = \frac{A}{s}$ | $|H(s)| = 3\text{dB}$ |
| $H(s) = A \left(1 - \frac{s}{\omega_o}\right)$ | $|H(s)| = 3\text{dB}$ | $\omega_o = 3\text{dB}$ |
| Right Half Plane | $\omega_o = \frac{A}{s}$ | $|H(s)| = 3\text{dB}$ |
| Zero at $\omega_o$ | $\omega_o = \frac{A}{s}$ | $|H(s)| = 3\text{dB}$ |
| $H(s) = \frac{A}{s^2 + \omega_o^2}$ | $\omega_o = \text{Corner Frequency}$ | $Q > \frac{1}{2} \implies \text{Complex Roots}$ |
| Second Order | $Q > \frac{1}{2} \implies \text{Complex Roots}$ | $Q = \text{Quality Factor: Exact Gain @ } \omega_o$ |
| Complex Pole | Approximate Maximum Value | $Q = \text{Exact Gain @ } \omega_o$ |
| $H(s) = \frac{A}{s^2 + \omega_o^2}$ | $\omega_o = \text{Corner Frequency}$ | $\omega_o = \text{Exact Phase: } -\tan^{-1} \left( \frac{\omega}{\omega_o} \right)$ |
| Second Order | Complex Pole | $\omega_o = \text{Complex Pole}$ |