

$$H(j\omega) = \frac{1}{(j\omega)^2 + 5j\omega + 100}$$

poles: $j\omega = -\frac{5}{2} \pm \frac{5\sqrt{15}}{2}i \Rightarrow \omega = -\frac{5}{2j} \pm \frac{5\sqrt{15}}{2}$ Since the function has no real poles, it does not have resonant peak

Imagine a transfer function has real poles.

$H(j\omega) = \frac{1}{(\omega-a)(\omega-b)}$ then as $\omega \rightarrow a \Rightarrow H(j\omega) \rightarrow \infty$ $H(j\omega)$ goes to its max. value