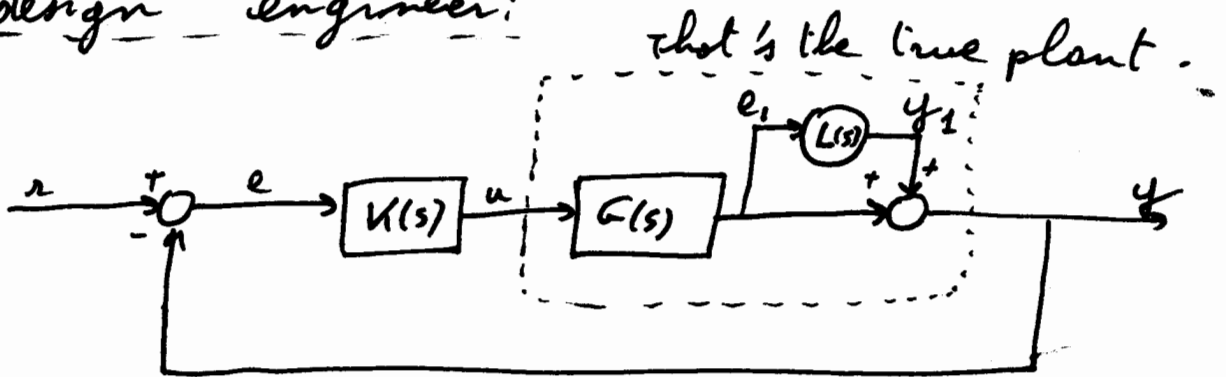


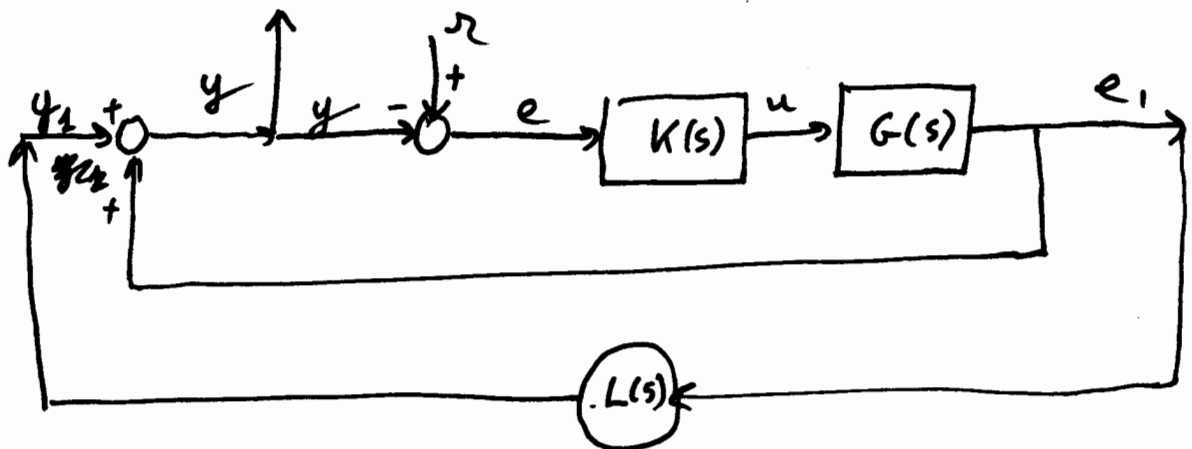
A summary of how to understand disturbances.

The world according to the control design engineer:

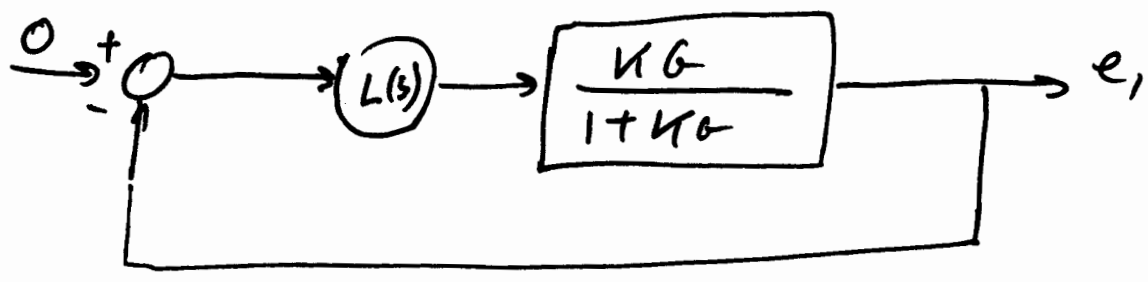
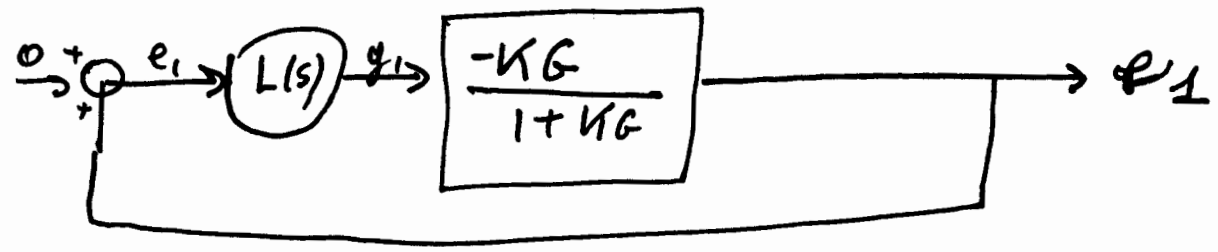


Goal of the design engineer: Find K so that this thing works well.

The world according to the disturbance:



The world according to the disturbance (again, but slightly manipulated)



12.

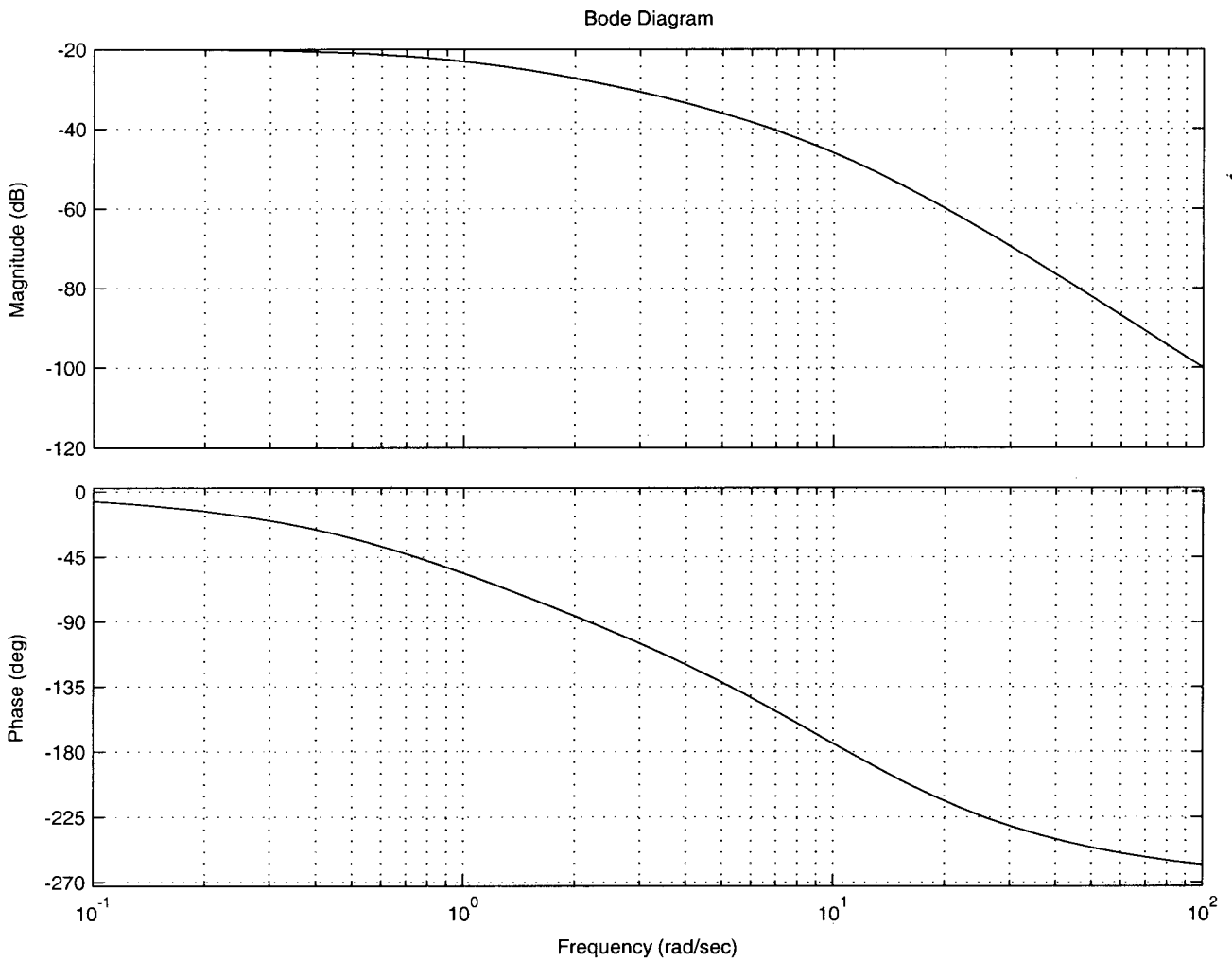
Goal of the uncertainty: mess this plant up as much as possible, within bounds:

$$|L(s)| \ll |L(j\omega)| < \underbrace{l(j\omega)}$$

The open-loop system for the disturbance is the closed-loop system of the engineer

we know how much we do not know

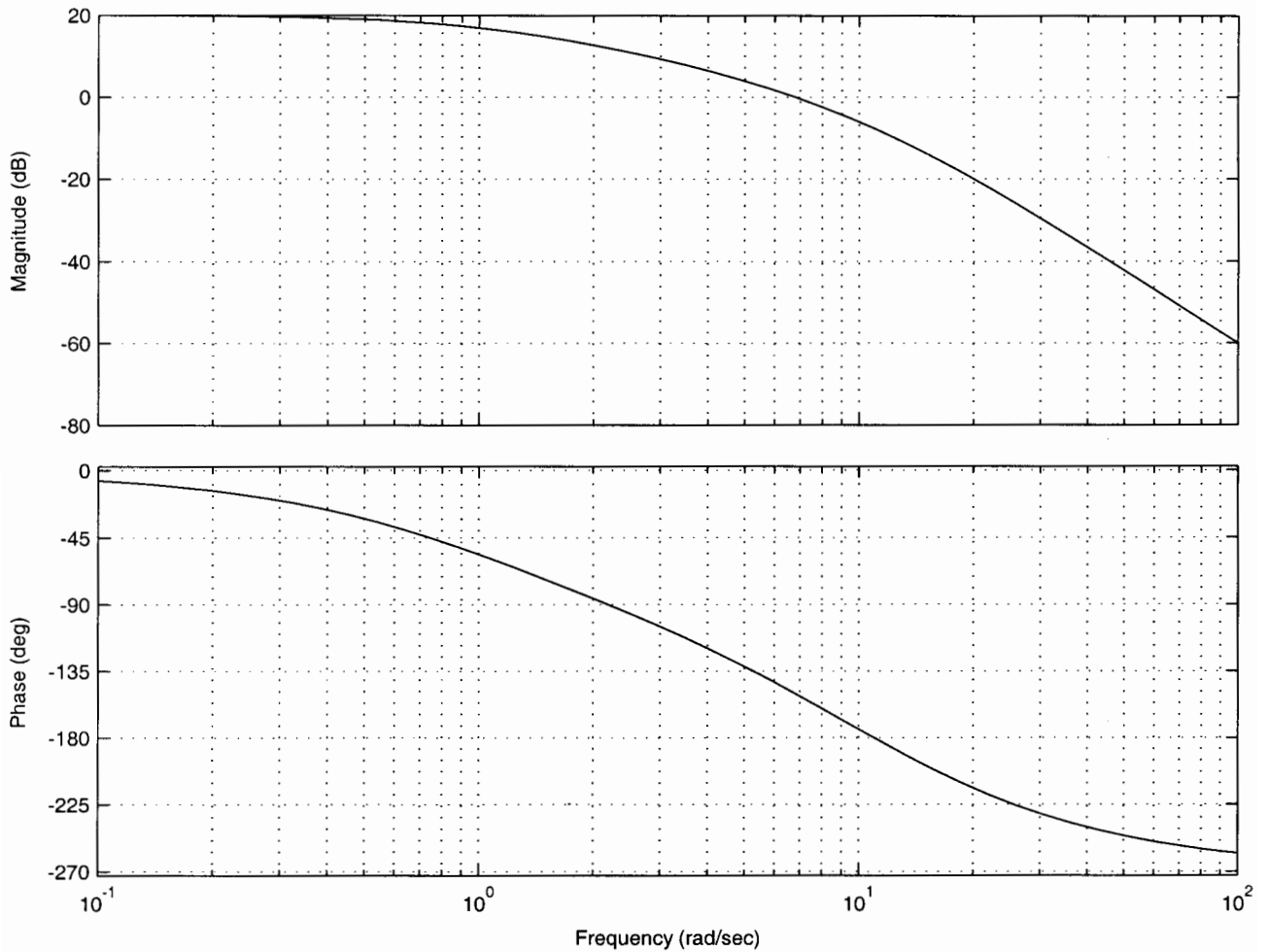
$$G(s) = \frac{1}{10(s+1)(s/10+1)^2}$$



$$KG(s) = \frac{100}{10(s+1)(s/10+1)^2}$$

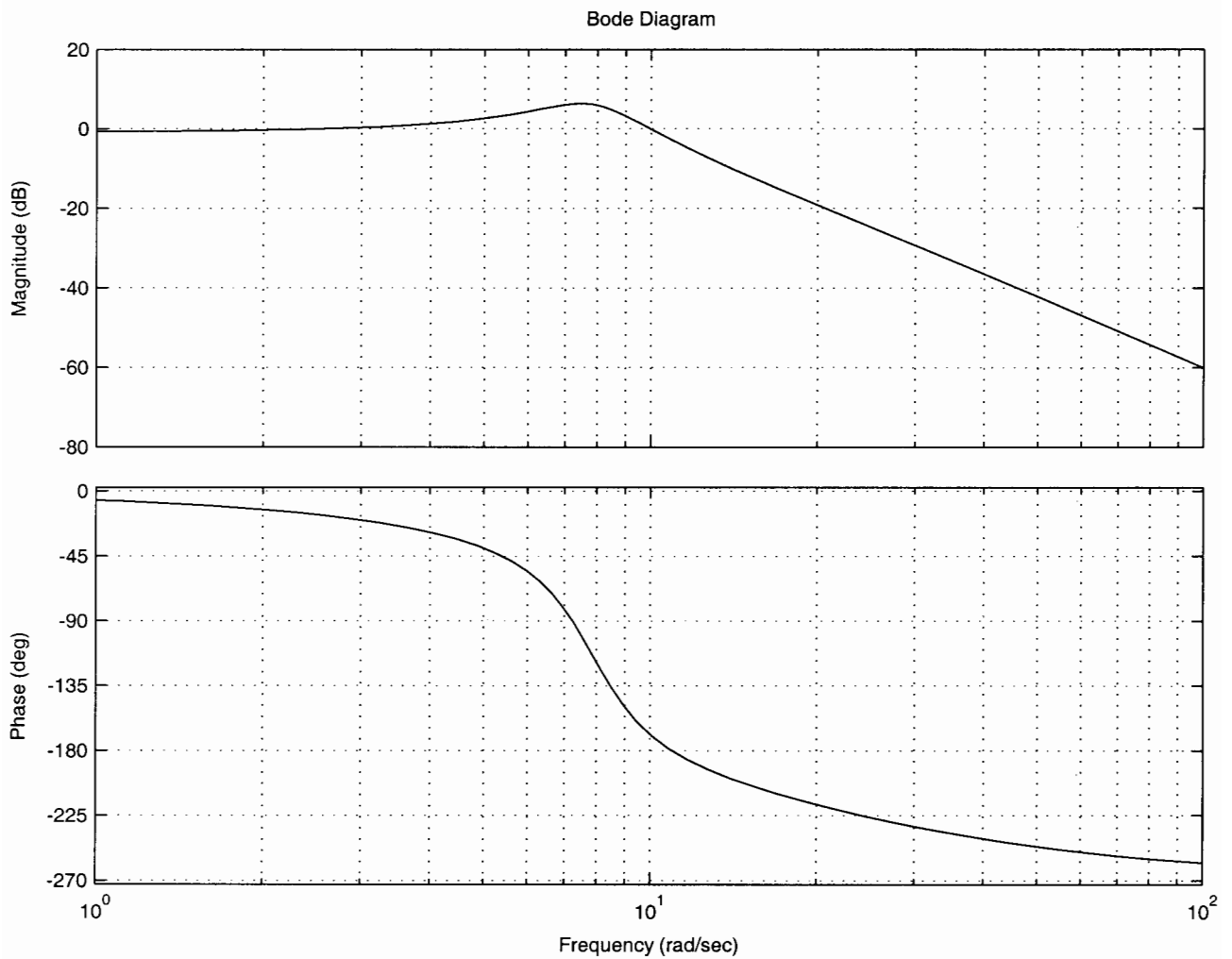
$K = 100$

Bode Diagram



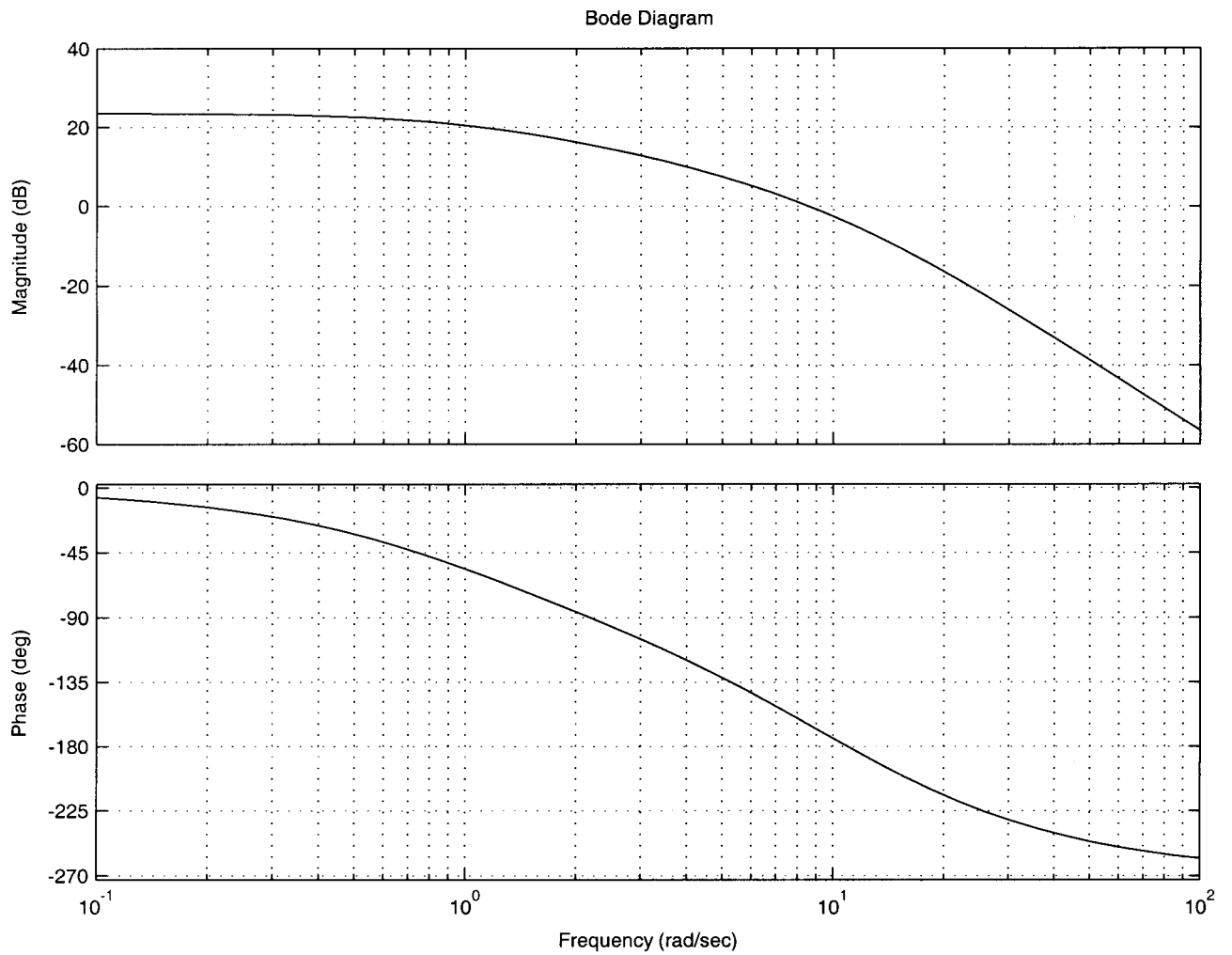
$$K=100$$

$$\frac{KG}{1+KG}$$



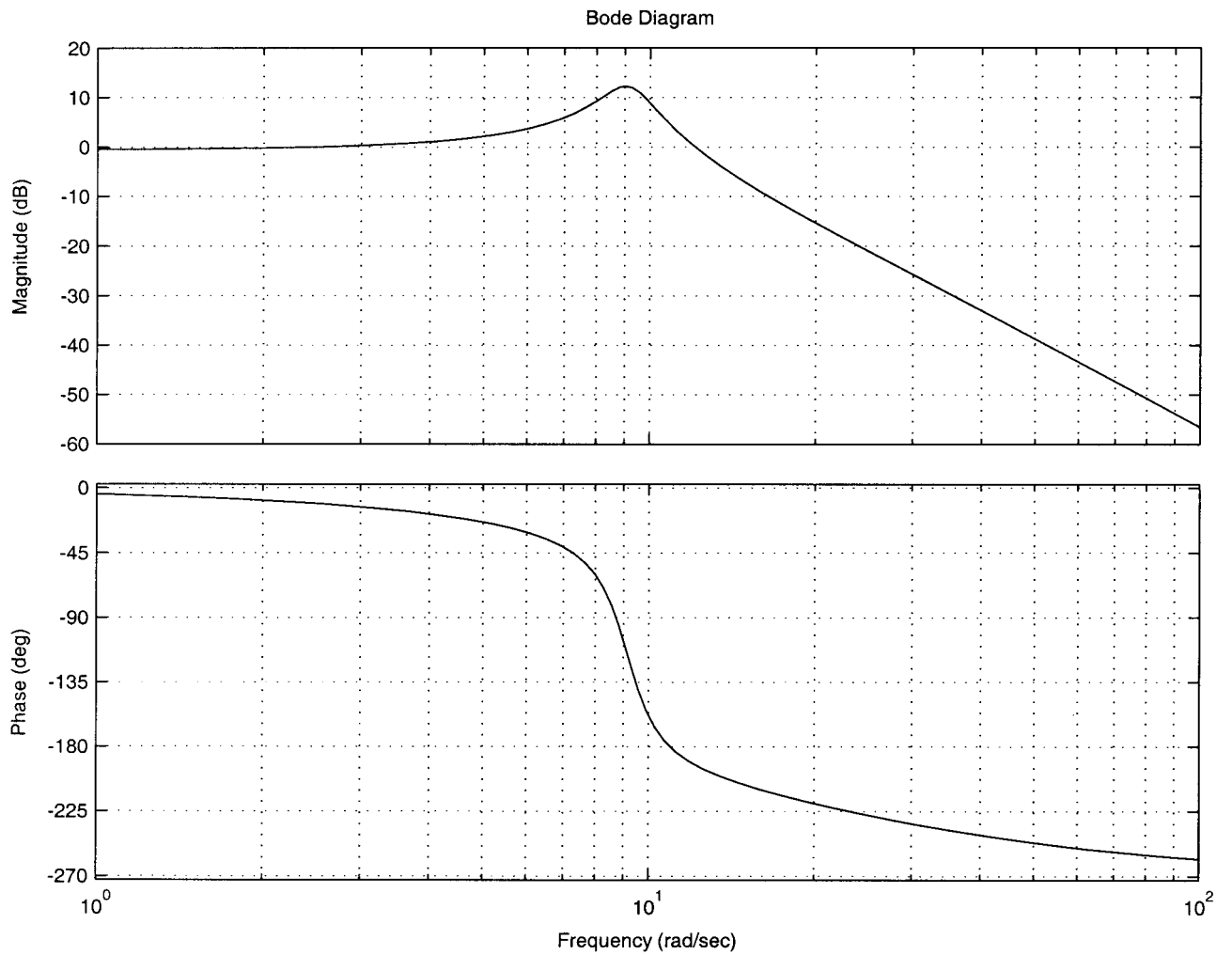
$$K = 150$$

KG.



$$K = 150$$

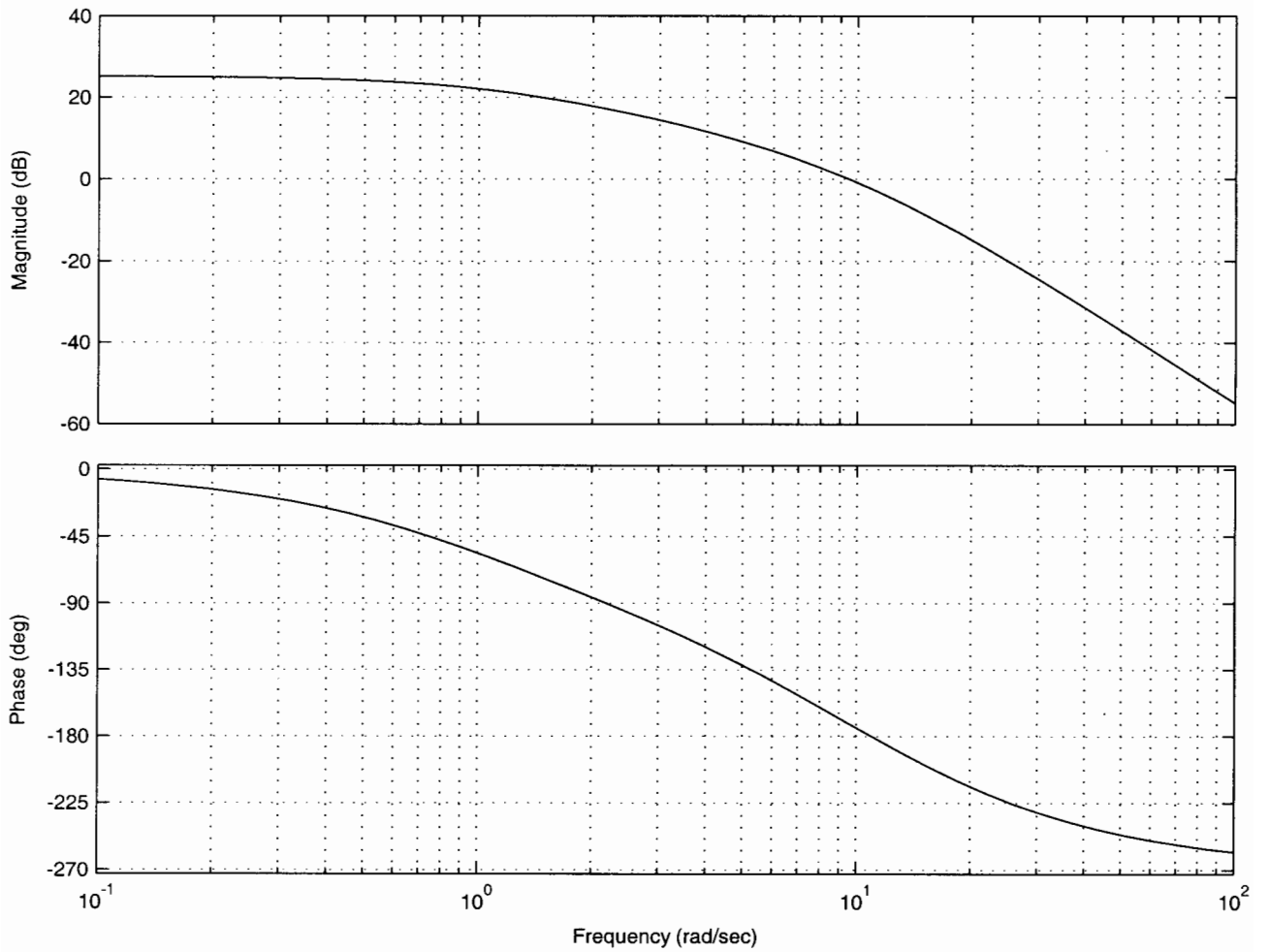
$$\frac{KG}{1+KG}$$



$$\tau = 180$$

VG.

Bode Diagram



$$K = 180$$

$$\frac{KG}{1+KG}$$

