



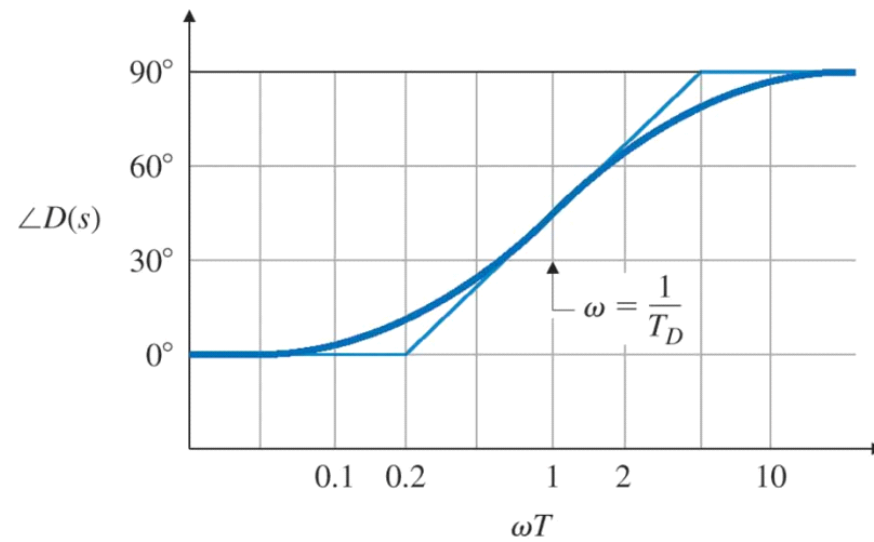
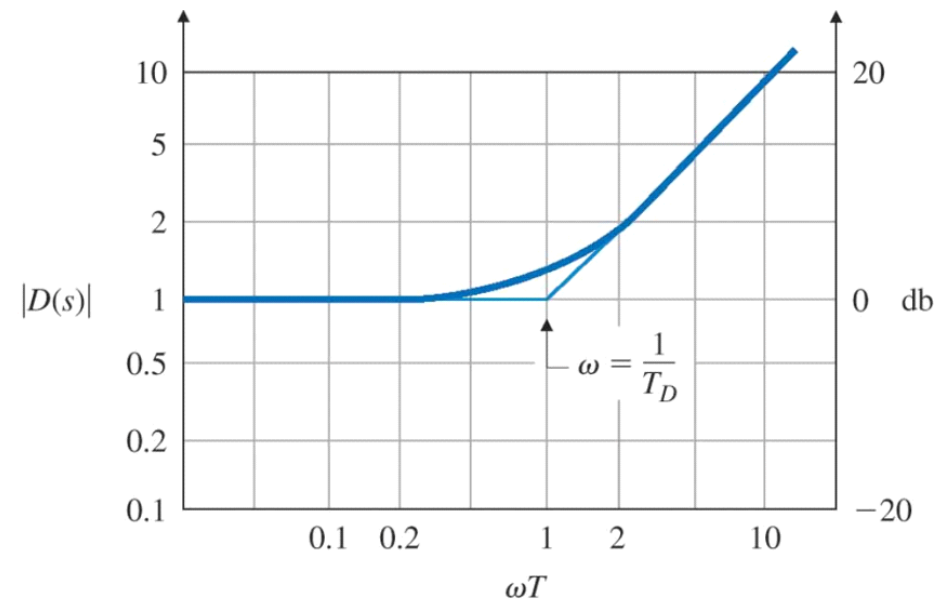
Controle e Servomecanismo

TE240

Projeto de controladores no domínio da frequência

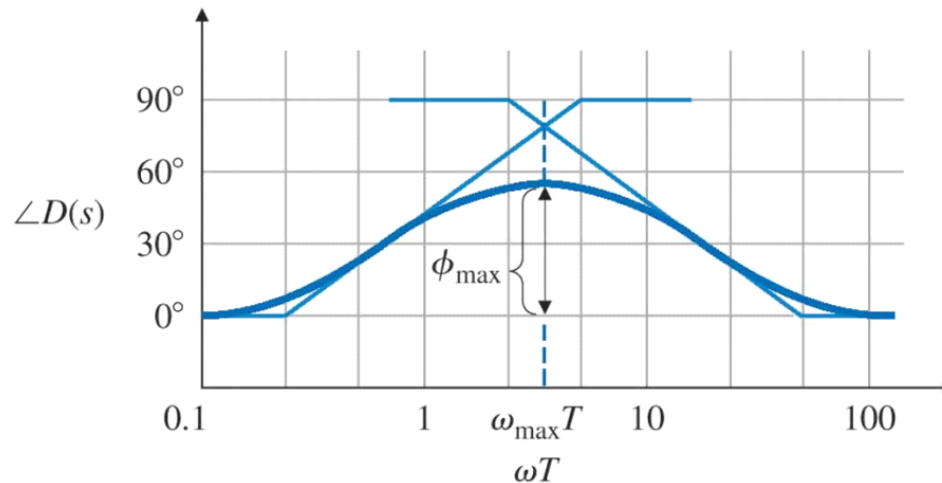
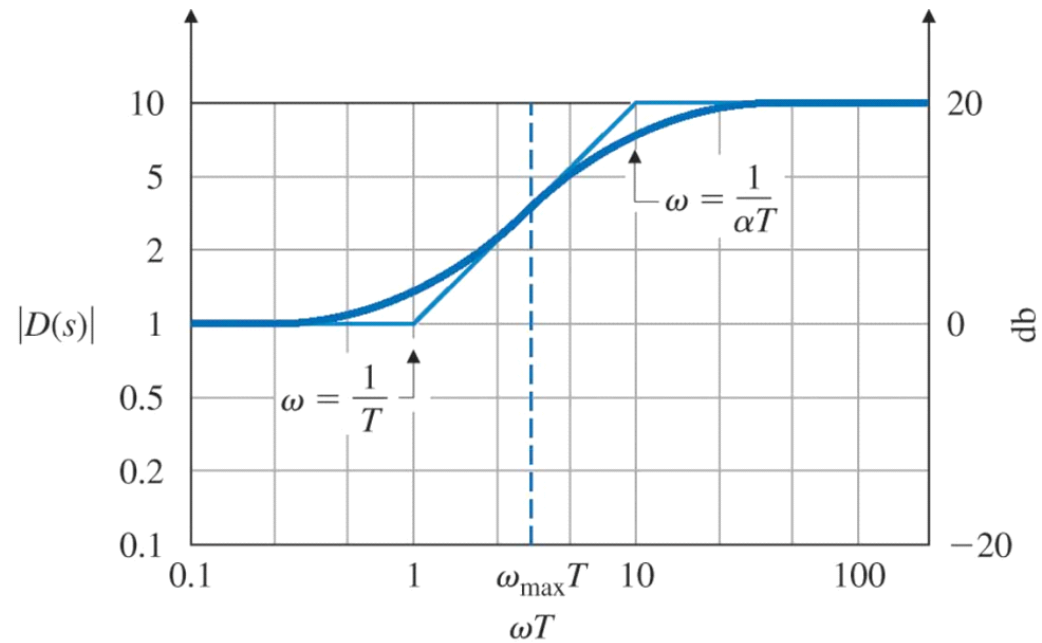
Juliana L. M. Iamamura
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Controlador PD



Controlador de avanço de fase

$$1/\alpha = 10$$



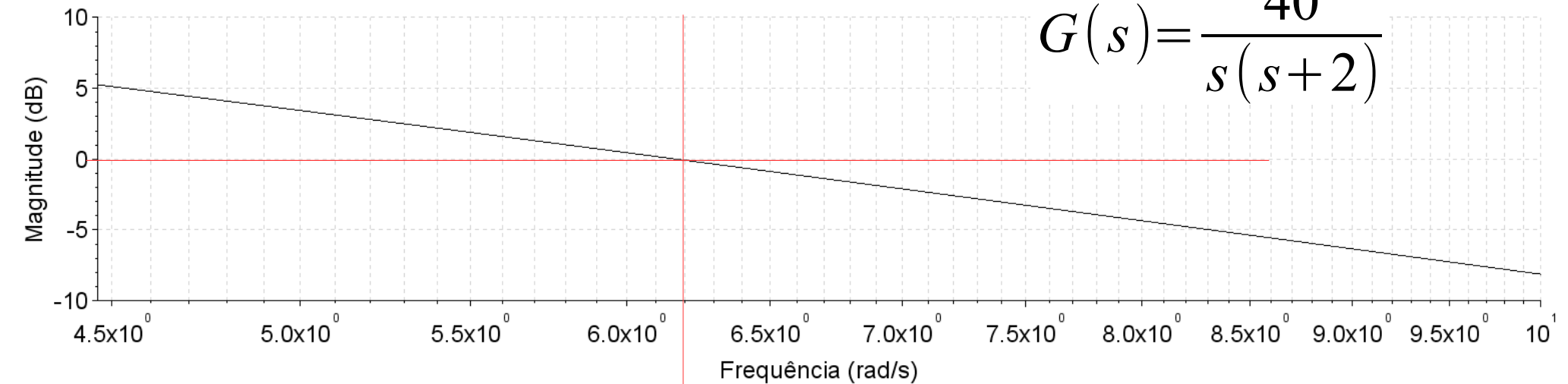
Exemplo 2: Controlador de avanço de fase

- Seja a planta caracterizada por $G(s) = \frac{K}{s(s+2)}$

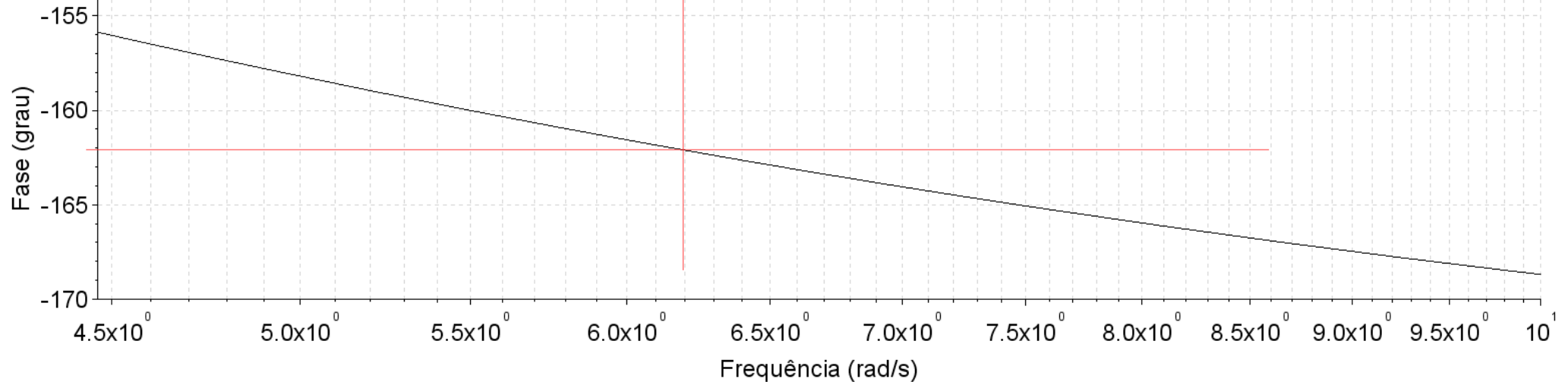
Projete um controlador para que o erro à rampa seja de até 5%, e para que $\zeta = 0,45$.

Exemplo 2: Controlador de avanço de fase

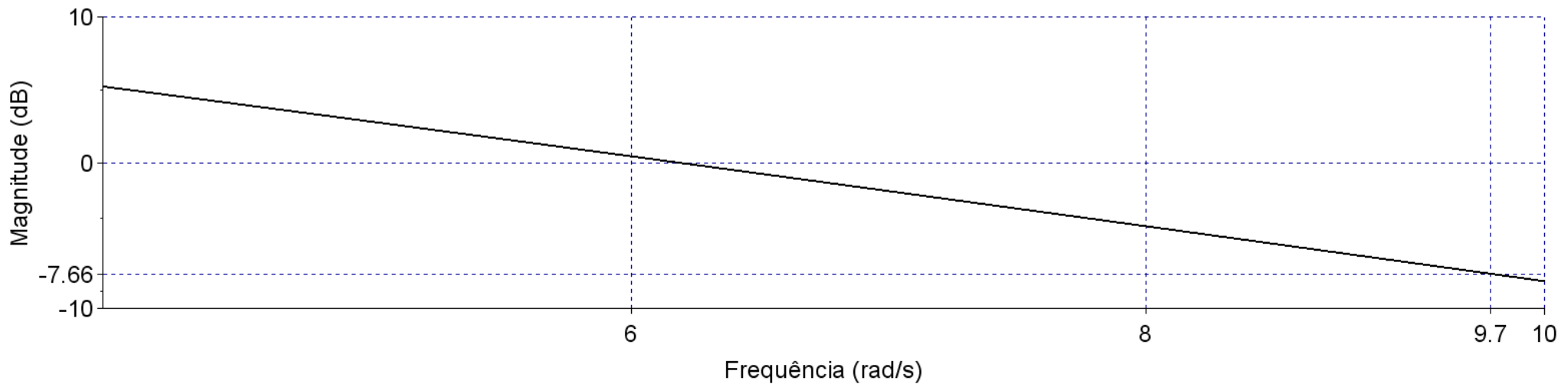
$$G(s) = \frac{40}{s(s+2)}$$



$$MF = 180^\circ - 162^\circ = 18^\circ$$

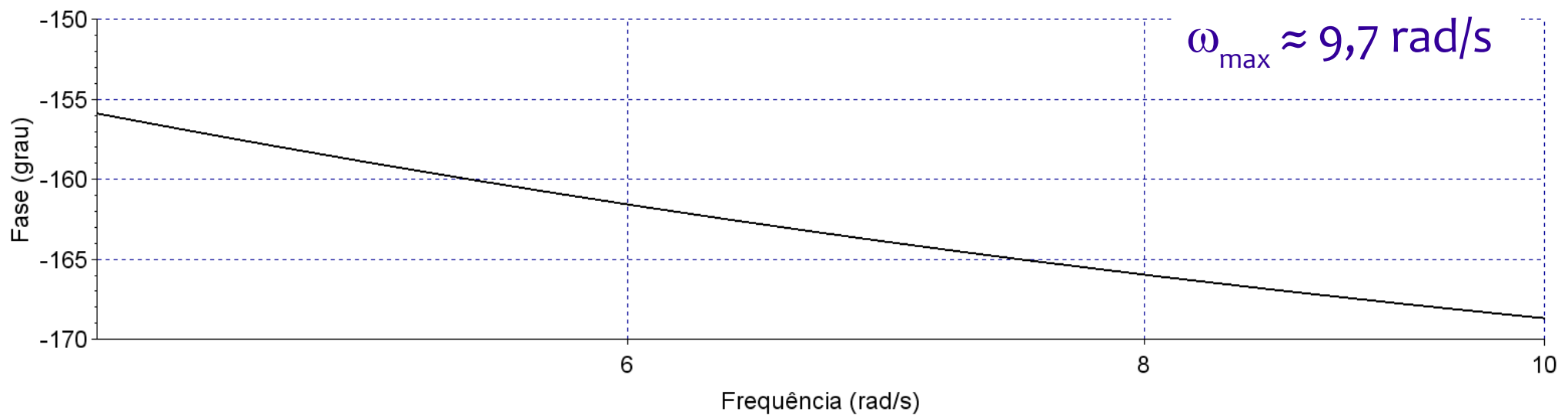


Exemplo 2: Controlador de avanço de fase

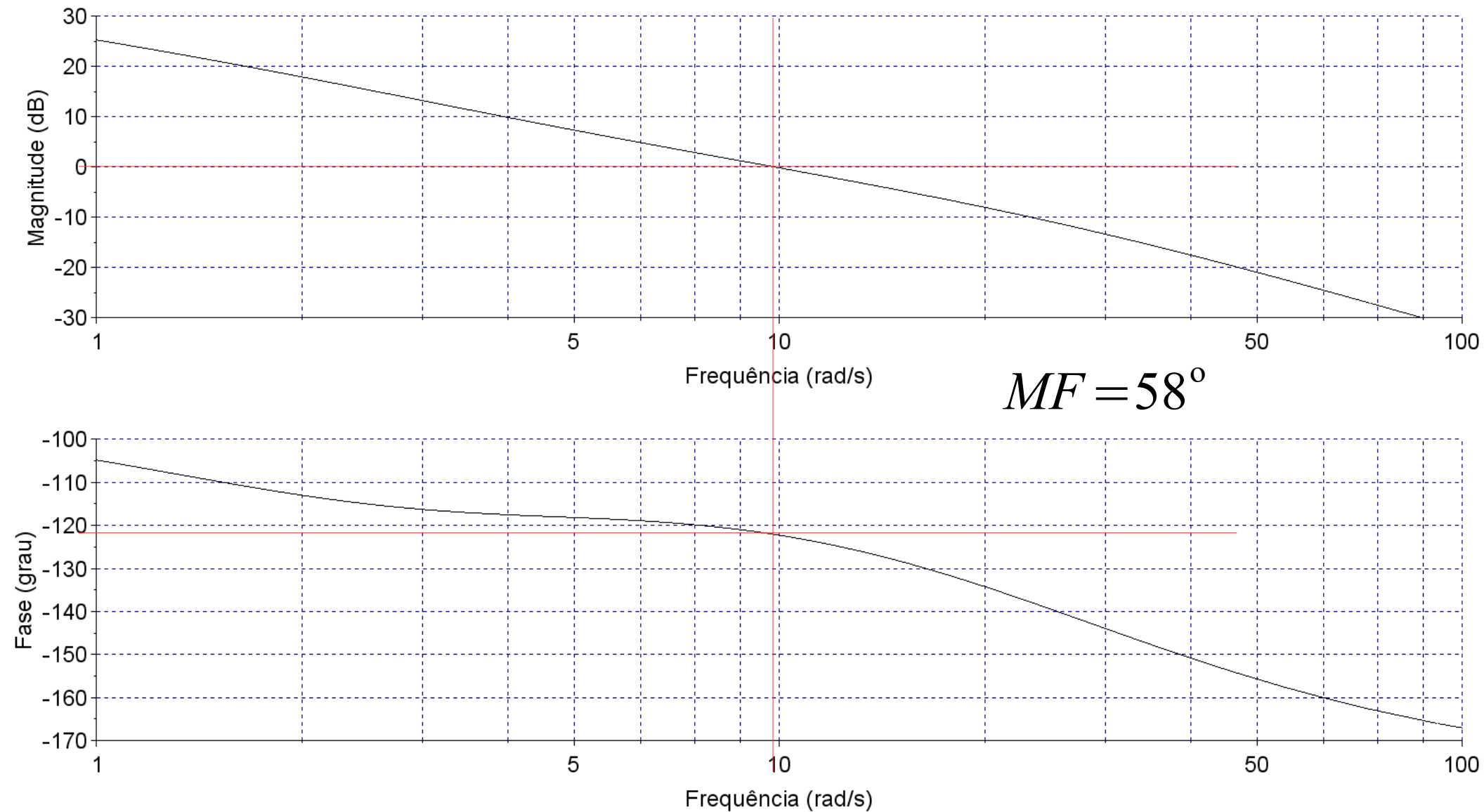


$$K_{\omega_{\max}} = 7,66 \text{ dB}$$

$$\omega_{\max} \approx 9,7 \text{ rad/s}$$

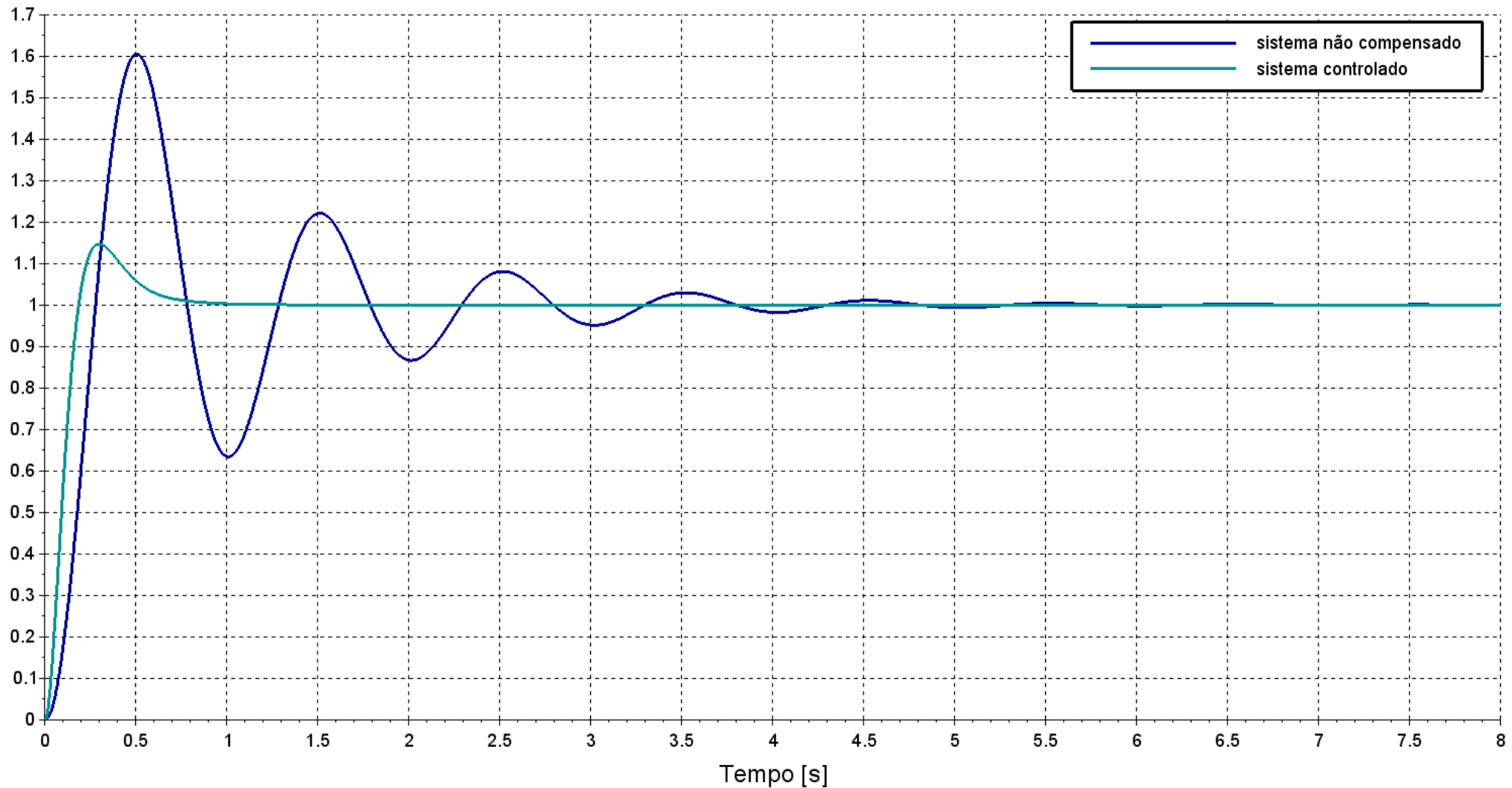


Exemplo 2: Controlador de avanço de fase



Exemplo 2: Controlador de avanço de fase

- Resposta temporal:

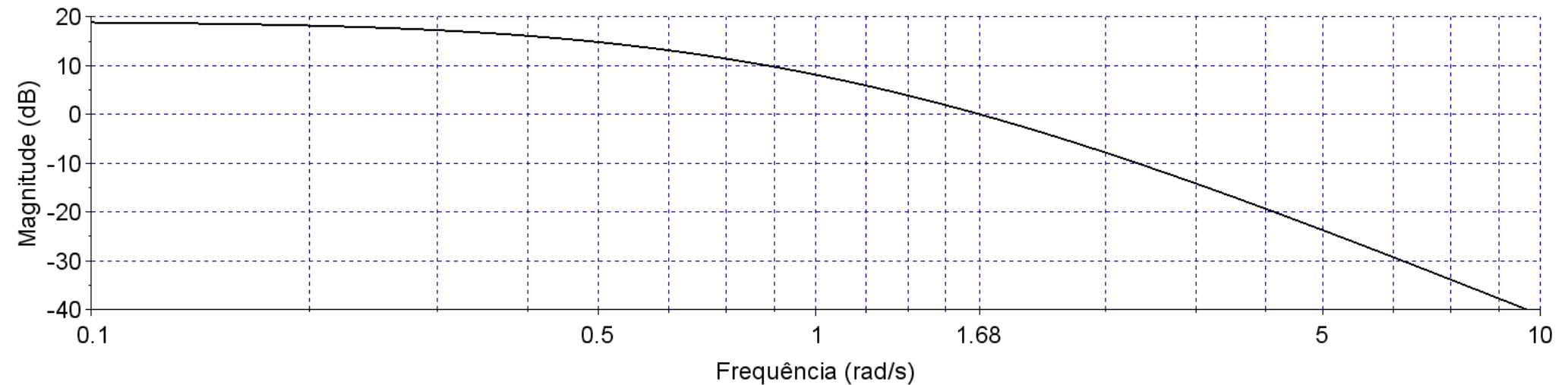


Exemplo (Franklin 6.16)

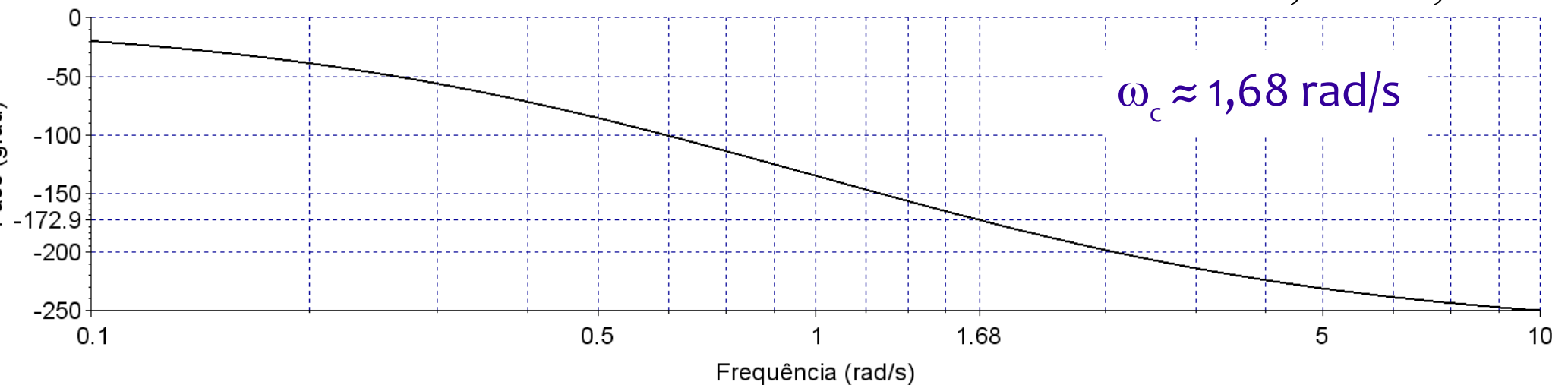
- Seja o sistema de controle de temperatura caracterizado por $KG(s) = \frac{K}{\left(1 + \frac{s}{2}\right)(1+s)(1+2s)}$.

Projete um controlador que proporcione uma margem de fase de 25° , e uma constante de erro de posição $K_p = 9$.

Exemplo (Franklin 6.16)

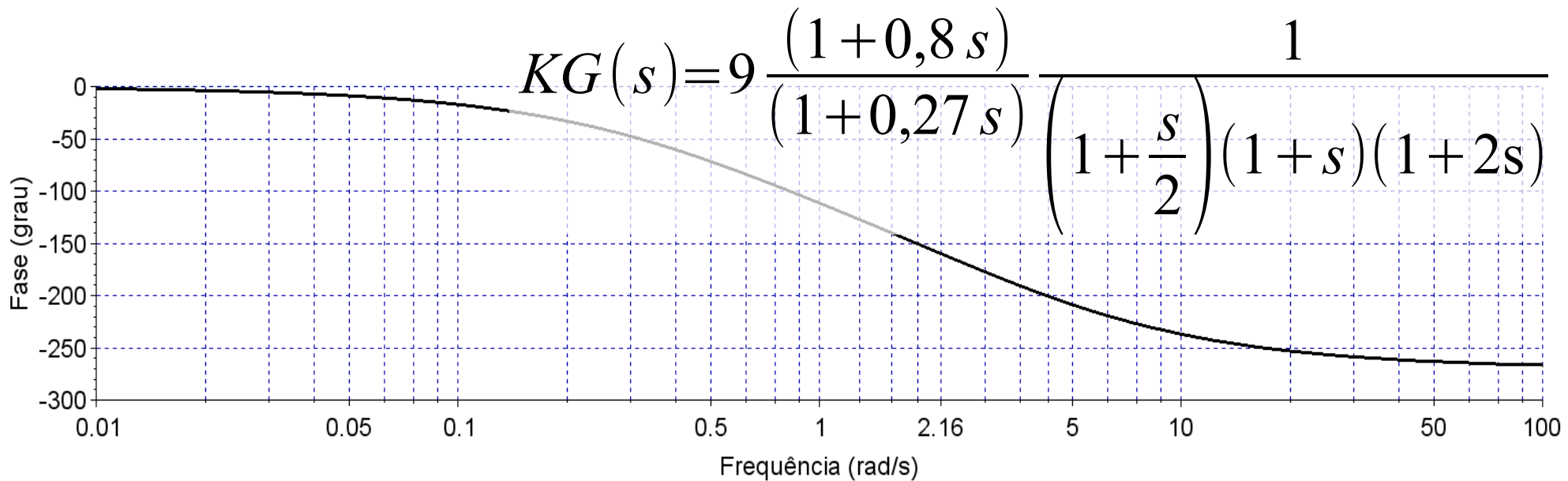
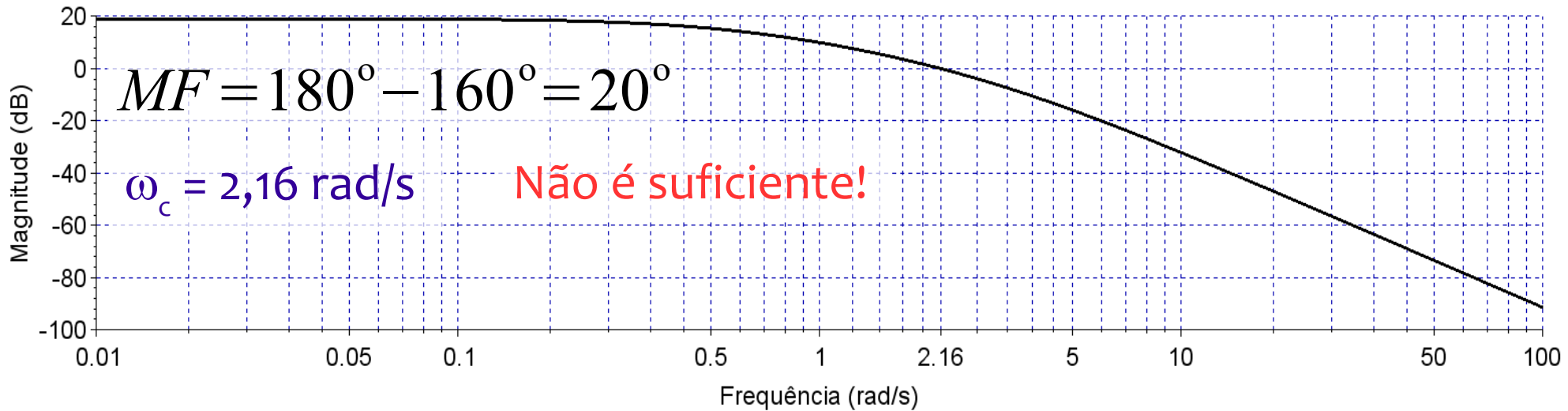


$$MF = 180^\circ - 172,9^\circ = 7,1^\circ$$

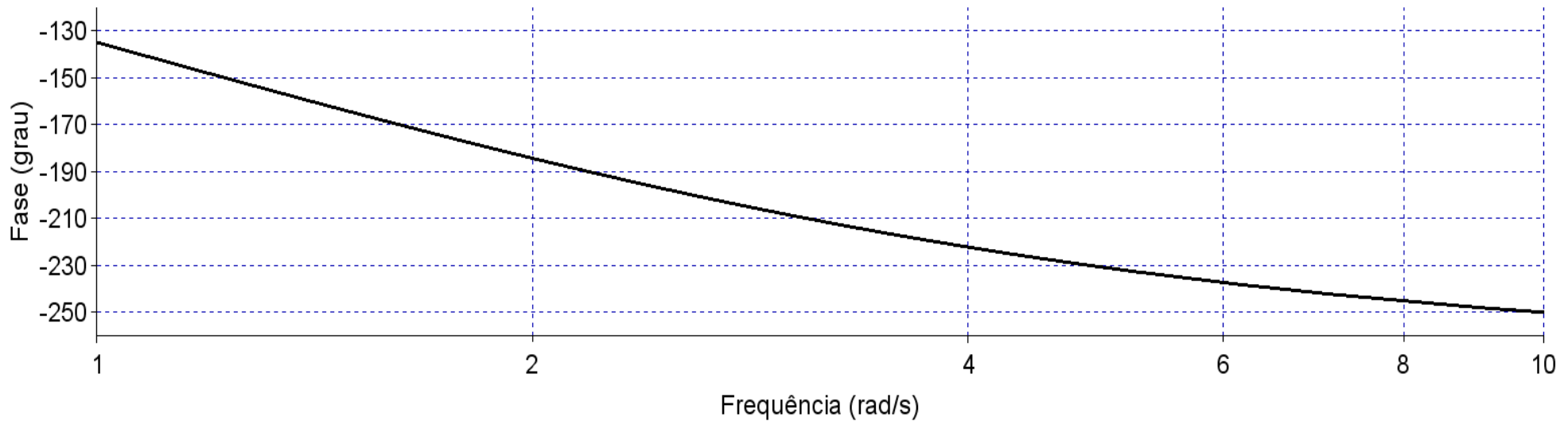
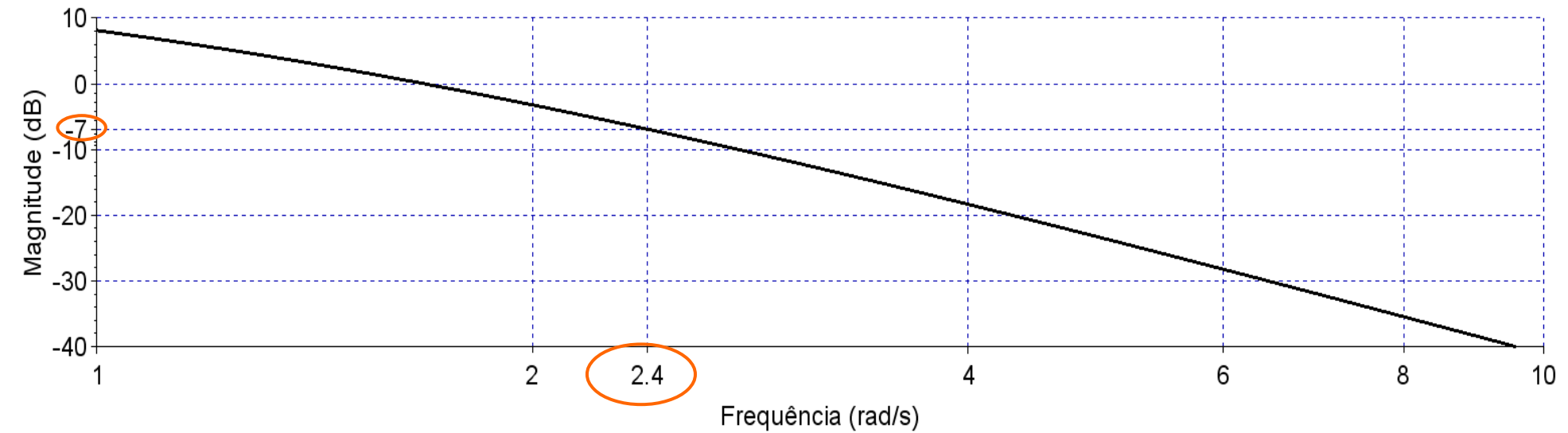


$$\omega_c \approx 1,68 \text{ rad/s}$$

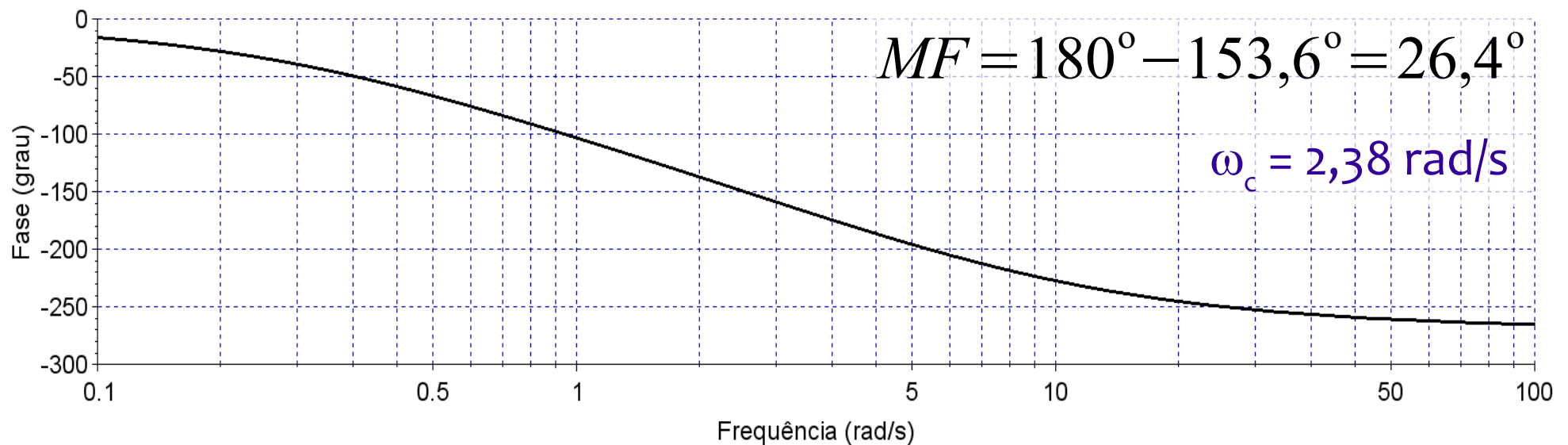
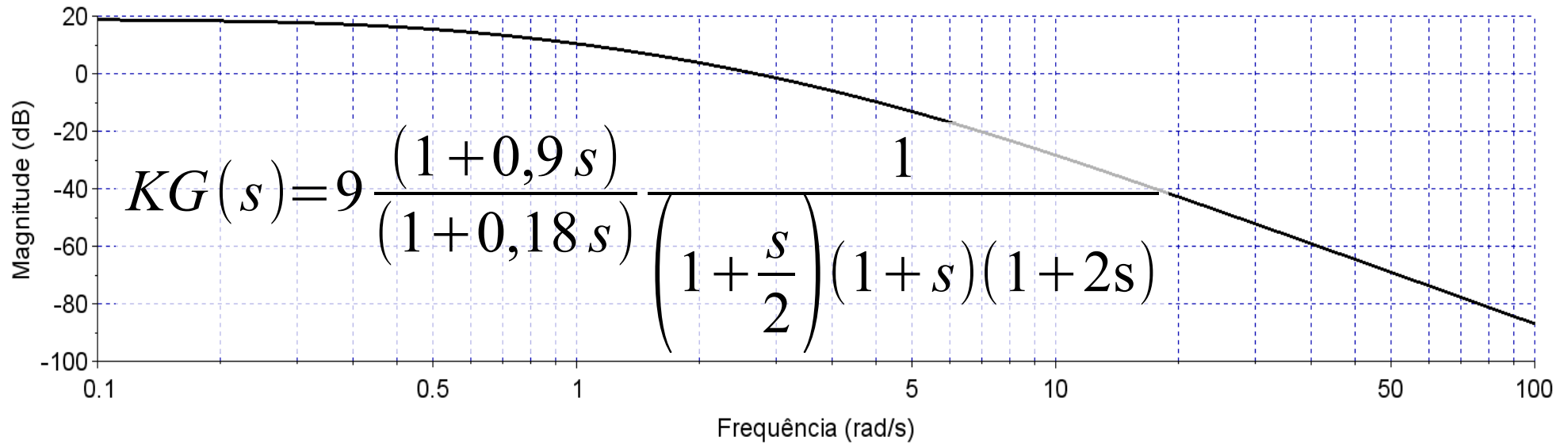
Exemplo:



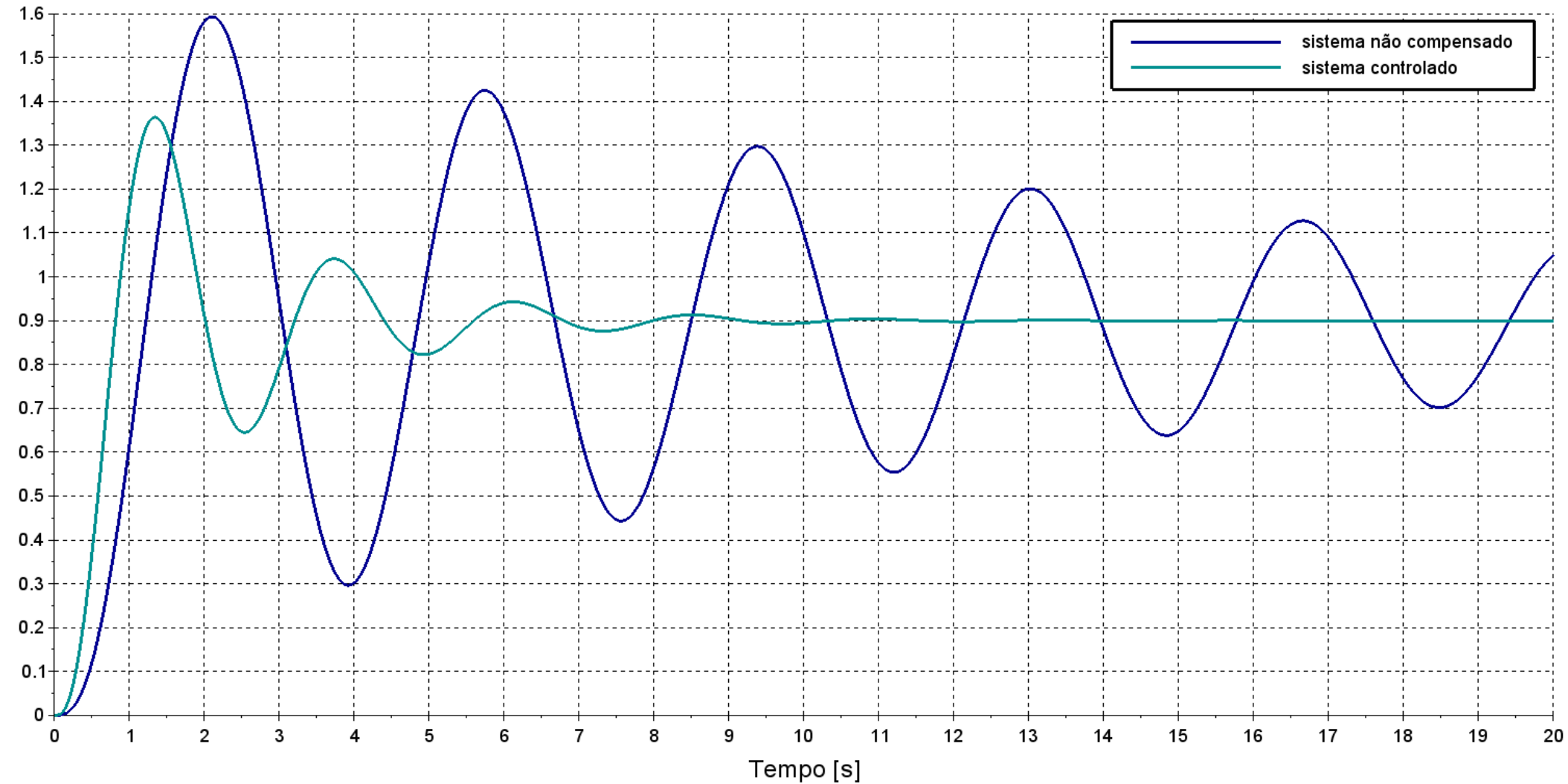
Exemplo:



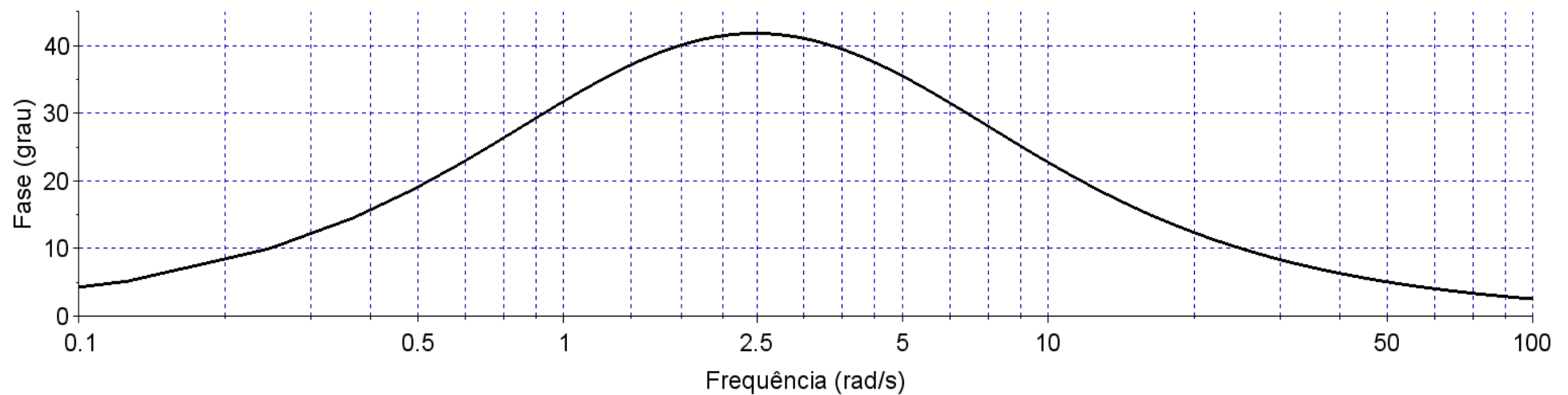
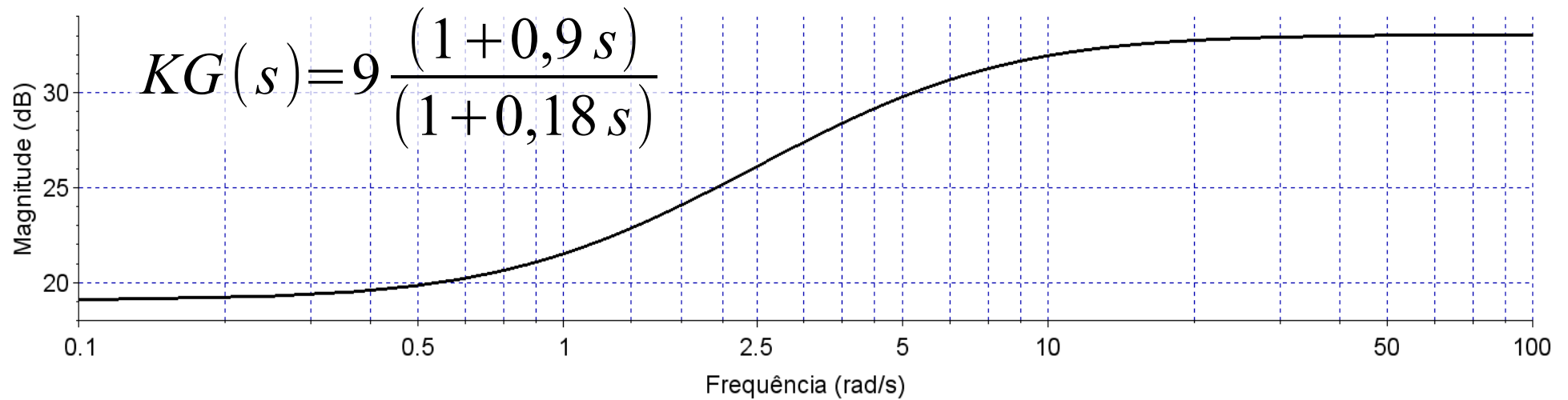
Exemplo:



Exemplo:



Exemplo:



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