c) $G(s) = \dfrac{5(s+1)(s+100)}{(s+5)(s+10)}$

(1) (2) (3) (4) (5)

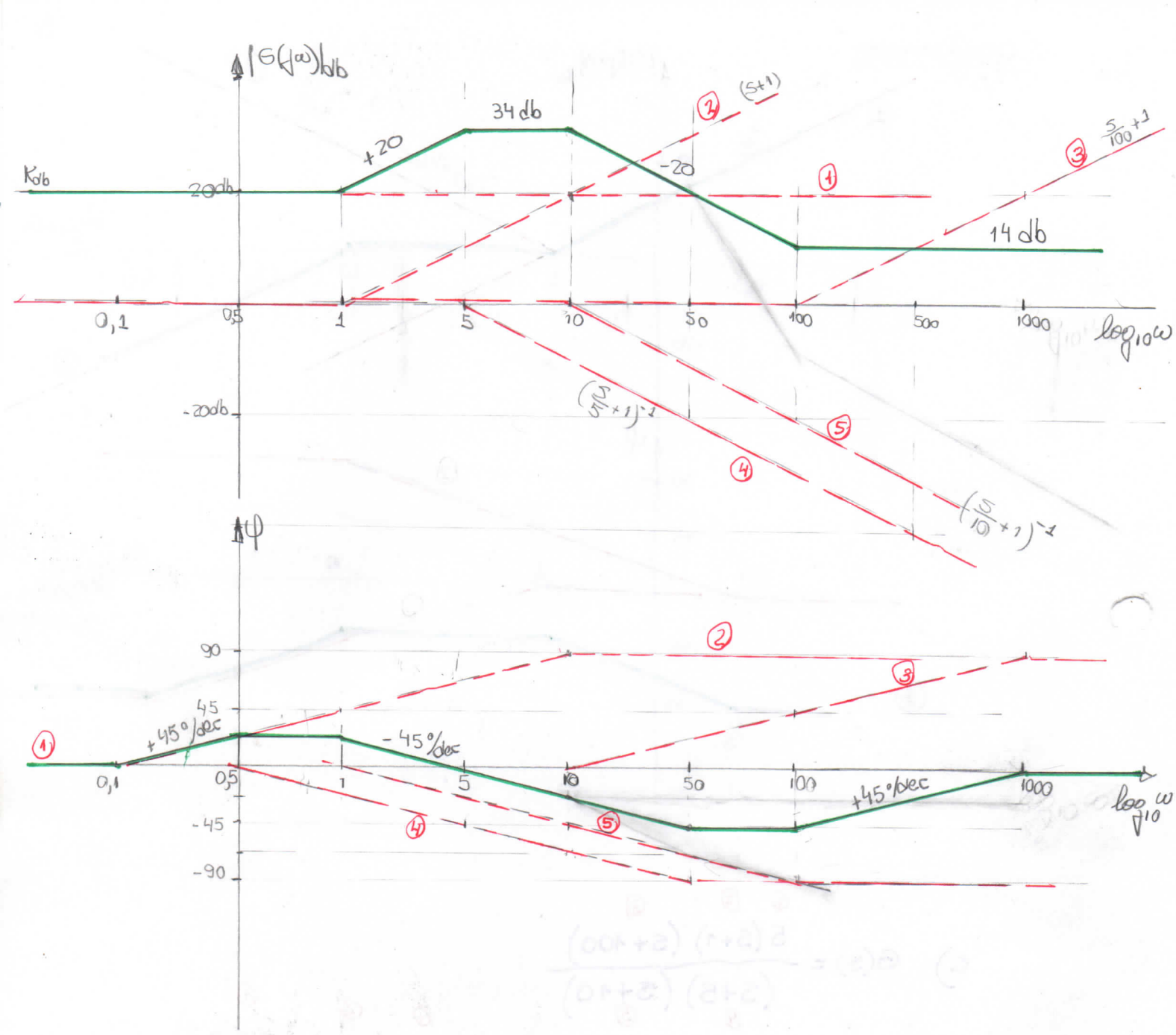
$$G(s) = \frac{5\times 100\,(s+1)\left(\frac{s}{100}+1\right)}{5\times 10\left(\frac{s}{5}+1\right)\left(\frac{s}{10}+1\right)} = \frac{10\,(s+1)\left(\frac{s}{100}+1\right)}{\left(\frac{s}{5}+1\right)\left(\frac{s}{10}+1\right)}$$

(1) (2) (3) (4) (5)

P/ $s = j\omega$

$$G(j\omega) = \frac{10\,(j\omega+1)\left(j\frac{\omega}{100}+1\right)}{\left(j\frac{\omega}{5}+1\right)\left(j\frac{\omega}{10}+1\right)}$$

$K_{db} = 20 \log 10 = 20\ db$



Calculo del módulo $|G(j\omega)|_{db}$ p/ frec. intermedias

$5 \ll S \ll 10 \Rightarrow G(S) = \dfrac{10S \cdot 1}{\frac{S}{5} \cdot 1} = 50 \Rightarrow 20 \log_{10} 50 = \underline{34\ db}$

$S \gg 100 \Rightarrow G(S) = \dfrac{10S \cdot \frac{S}{100}}{\frac{S}{5} \cdot \frac{S}{10}} = \dfrac{10 \times 5 \times 10}{100} = 5 \Rightarrow 20 \log 5 = \underline{14\ db}$

Calculo de φ

$0{,}5 \ll S \ll 1 \quad G(S) = 10 \quad \varphi = \operatorname{tg}^{-1} 0 =$

$50 \ll S \ll 100 \quad G(S) = \dfrac{10S}{\frac{S}{5} \times \frac{S}{10}} = \dfrac{500}{S} \Rightarrow G(j\omega) = \dfrac{500}{j\omega} \Rightarrow \varphi = -\operatorname{tg}^{-1} \dfrac{\omega}{0} = -\operatorname{tg}^{-1} \infty = -90°$

Diagrama de fase de $G(j\omega) = \dfrac{10(j\omega+1)(j\frac{\omega}{100}+1)}{(j\frac{\omega}{5}+1)(j\frac{\omega}{10}+1)}$