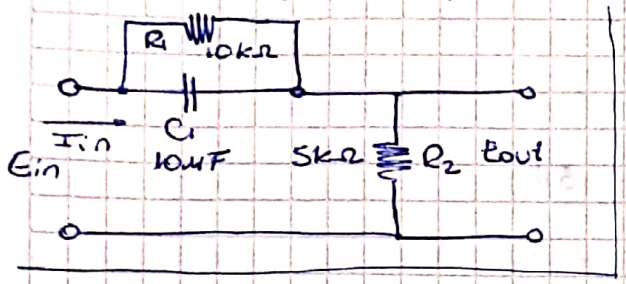
46) Encontrar $F(P)$ y trazar diagrama de BODE. de magnitud y fase.



$$Ein = Iin\left(\frac{R_1 \cdot \frac{1}{C_1 P}}{R_1 + \frac{1}{C_1 P}} + R_2\right)$$

$$Ein = Iin\left(\frac{R_1 + R_2 + R_2 R_1 C_1 P}{R_1 C_1 P + 1}\right)$$

$$Eout = R_2 \cdot Iin$$

$$F(P) = \frac{Eout}{Ein} = \frac{R_2}{\frac{R_2 R_1 C_1 P + R_1 + R_2}{R_1 C_1 P + 1}} = \frac{R_2 R_1 C_1 P + R_2}{R_2 R_1 C_1 P + R_1 + R_2}.$$

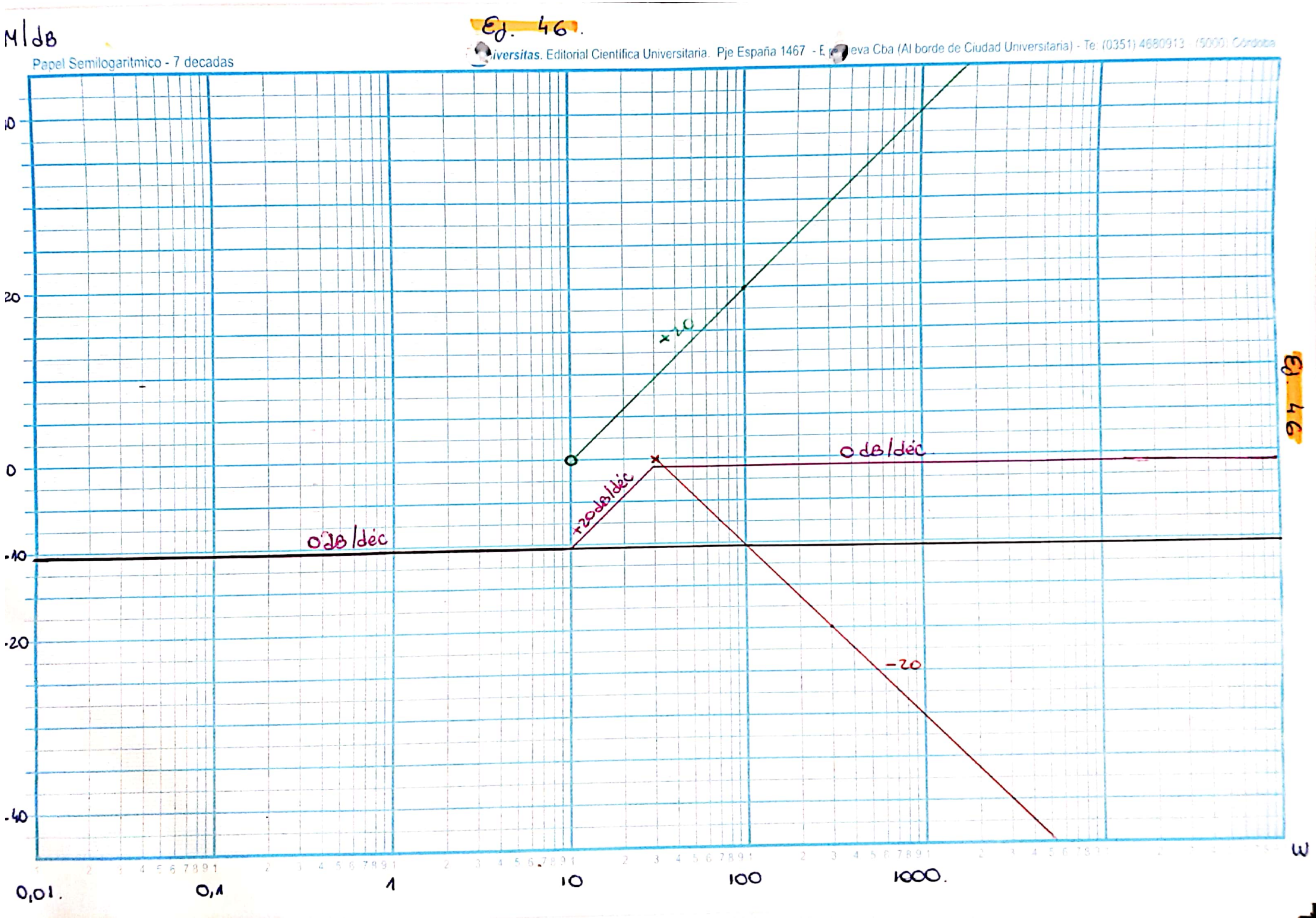
$$F(P) = \frac{500P + 5\times10^3}{500P + 15\times10^3} = \frac{P + 10}{P + 30}$$

$$\boxed{F(P) = \frac{P+10}{P+30}}$$

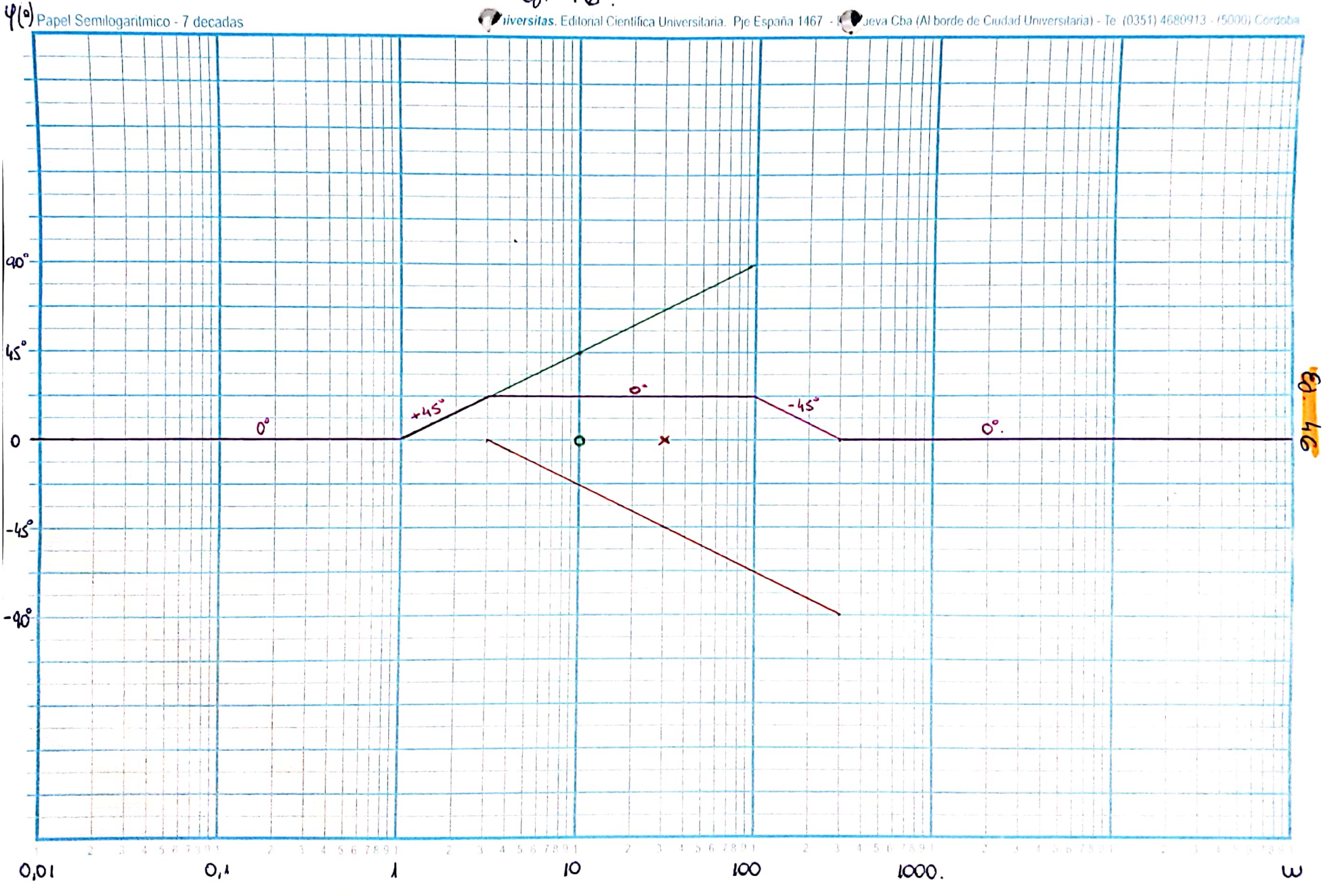
$$F(P) = \frac{10\left(\frac{P}{10}+1\right)}{30\left(\frac{P}{30}+1\right)} = \frac{0,3\left(\frac{P}{10}+1\right)}{\left(\frac{P}{30}+1\right)}$$

$$|F(P)|_{dB} = \underbrace{20 \log 0,3}_{-10,457\,dB} + 20 \log\sqrt{\left(\frac{\omega}{10}\right)^2 + 1} - 20 \log\sqrt{\left(\frac{\omega}{30}\right)^2 + 1}.$$

$$\boxed{F(P)} = tg^{-1}\left(\frac{\omega}{10}\right) - tg^{-1}\left(\frac{\omega}{30}\right)$$

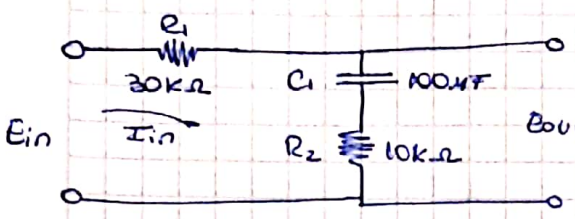


Ej. 46.



Ej. 46

47) Encontar $F(P)$ y trazar diagrama de BODE de magn. y fase.



$$E_{in} = I_{in}\left(R_1 + R_2 + \frac{1}{C_1 P}\right)$$

$$E_{in} = I_{in}\left(\frac{R_1 C_1 P + R_2 C_1 P + 1}{C_1 P}\right)$$

$$E_{out} = I_{in}\left(R_2 + \frac{1}{C_1 P}\right) = I_{in}\left(\frac{R_2 C_1 P + 1}{C_1 P}\right)$$

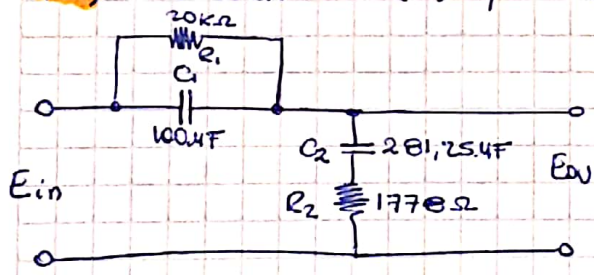
$$F(P) = \frac{E_{out}}{E_{in}} = \frac{R_2 C_1 P + 1}{R_1 C_1 P + R_2 C_2 P + 1}$$

$$F(P) = \frac{P+1}{4P+1} = \frac{0{,}25\,(P+1)}{(P+0{,}25)}$$

$$\boxed{F(P) = \frac{\frac{P}{1}+1}{\frac{P}{0{,}25}+1}}$$

- $|F(P)|_{dB} = 20\log\sqrt{\left(\frac{\omega}{1}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{0{,}25}\right)^2+1}$
- $\angle F(P) = tg^{-1}(\omega) - tg\left(\frac{\omega}{0{,}25}\right)$

48) Encontrar $F(P)$ y trazar BODE de magn. y fase.

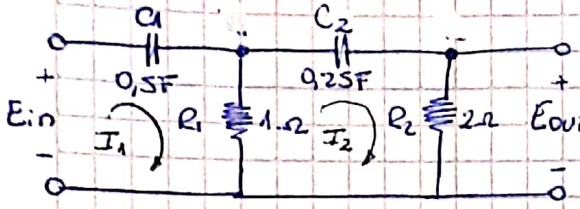


$$F(P) = \frac{(R_2 C_2 P + 1)(R_1 C_1 P + 1)}{R_1 R_2 C_1 C_2 P^2 + R_1 C_2 P + R_1 C_1 P + R_2 C_2 P + 1}$$

$$F(P) = \frac{(P+0{,}5)(P+2)}{(P+0{,}125)(P+8)} = \frac{\left(\frac{P}{0{,}5}+1\right)\left(\frac{P}{2}+1\right)}{\left(\frac{P}{0{,}125}+1\right)\left(\frac{P}{8}+1\right)}$$

- $|F(P)| = 20\log\left(\sqrt{\left(\frac{\omega}{0{,}5}\right)^2+1}\right) + 20\log\sqrt{\left(\frac{\omega}{2}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{0{,}125}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{8}\right)^2+1}$
- $\angle F(P) = tg^{-1}\left(\frac{\omega}{0{,}5}\right) + tg^{-1}\left(\frac{\omega}{2}\right) - tg^{-1}\left(\frac{\omega}{0{,}125}\right) - tg^{-1}\left(\frac{\omega}{8}\right)$

49) Encontrar $F(p)$ y trazar BODE de magnitud y fase.



$$Z_{11} = R_1 + \frac{1}{C_1 P}$$

$$Z_{12} = Z_{21} = -R_1$$

$$Z_{22} = R_1 + R_2 + \frac{1}{C_2 P}$$

$$\begin{bmatrix} R_1 + \frac{1}{C_1 P} & -R_1 \\ -R_1 & R_1 + R_2 + \frac{1}{C_2 P} \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} E_{in} \\ 0 \end{bmatrix}$$

$$E_{out} = I_2 \cdot R_2$$

$$E_{out} = \frac{\Delta_2}{\Delta P} \cdot R_2 =$$

$$\Delta_2 = R_1 \cdot E_{in}$$

$$E_{out} = \frac{R_1 E_{in}}{\Delta P} \cdot R_2 \longrightarrow F(P) = \frac{E_{out}}{E_{in}} = \frac{R_1 \cdot R_2}{\Delta P}$$

$$\Delta P = \left(R_1 + R_2 + \frac{1}{C_2 P}\right)\left(R_1 + \frac{1}{C_1 P}\right) - R_1^2$$

$$\Delta P = \frac{R_1 C_2 P + R_2 C_2 P + 1}{C_2 P} \cdot \frac{C_1 P R_1 + 1}{C_1 P} - R_1^2$$

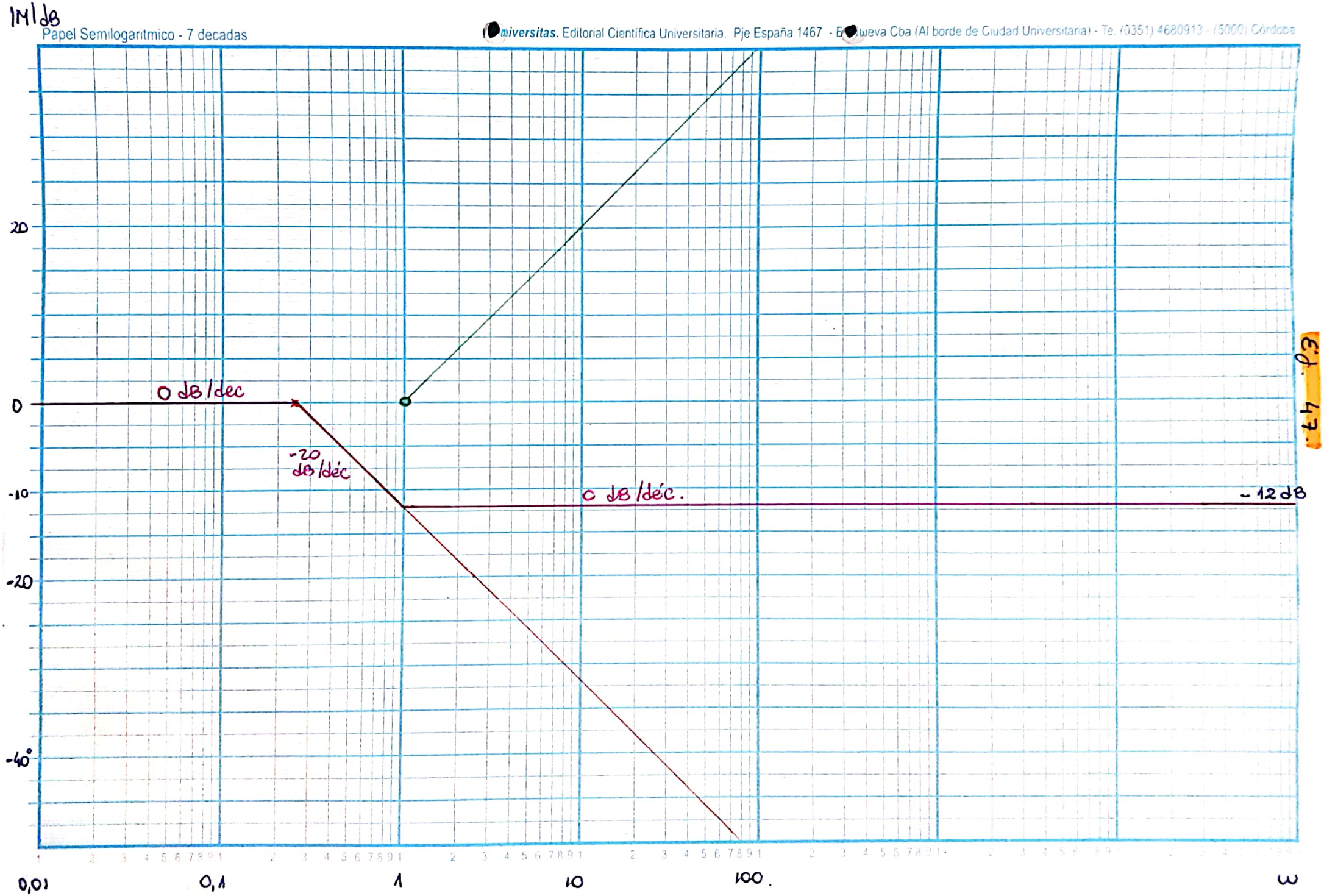
$$\Delta P = \frac{0{,}25P + 0{,}5P + 1}{0{,}25P} \cdot \frac{0{,}5P + 1}{0{,}5P} - 1 = \frac{(0{,}75P + 1)(0{,}5P + 1) - 0{,}125P^2}{0{,}125P^2}$$

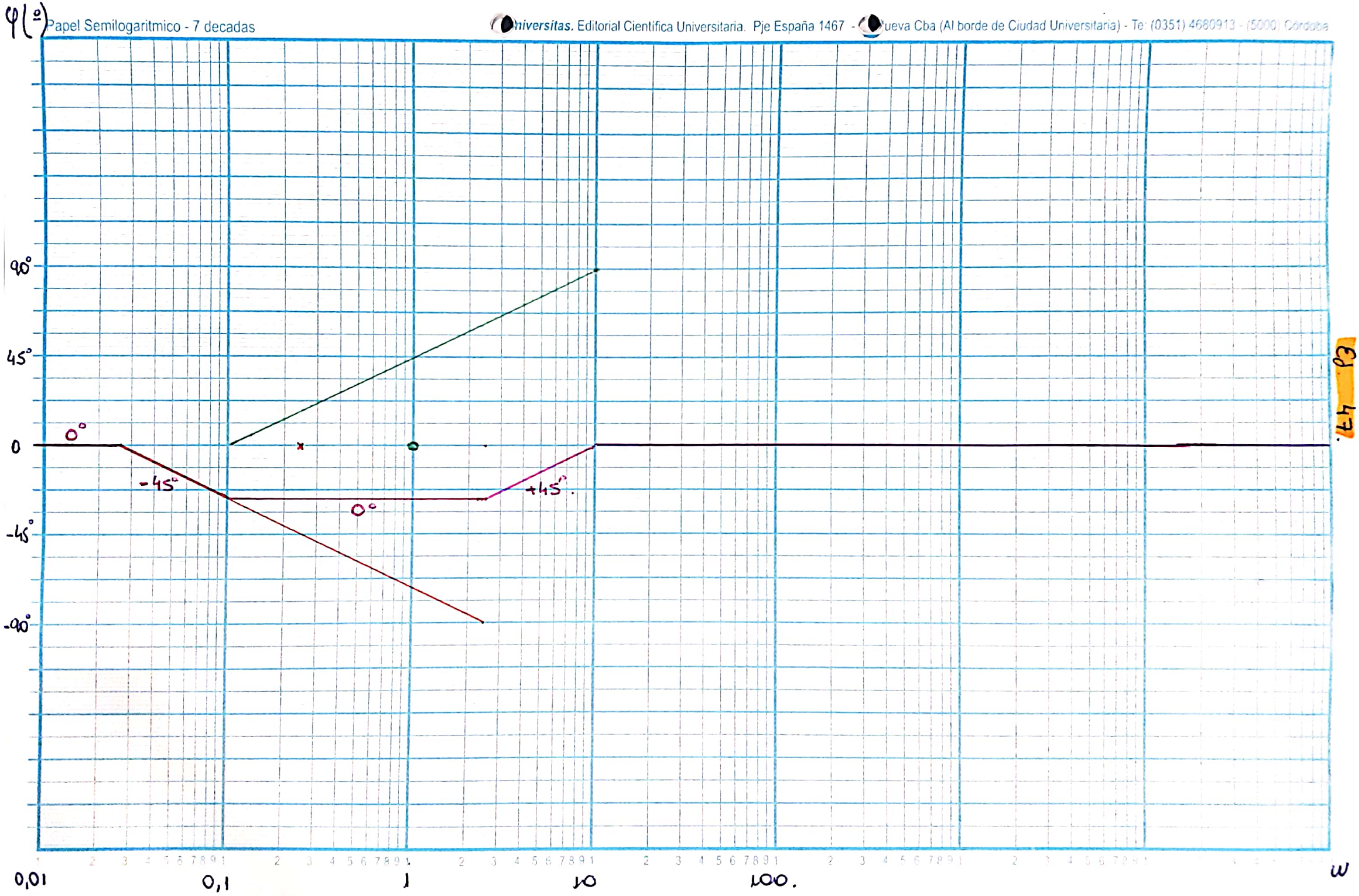
$$\Delta P = \frac{0{,}25P^2 + 1{,}5P + 1}{0{,}125P^2} = \frac{2(P+1)(P+4)}{P^2}$$

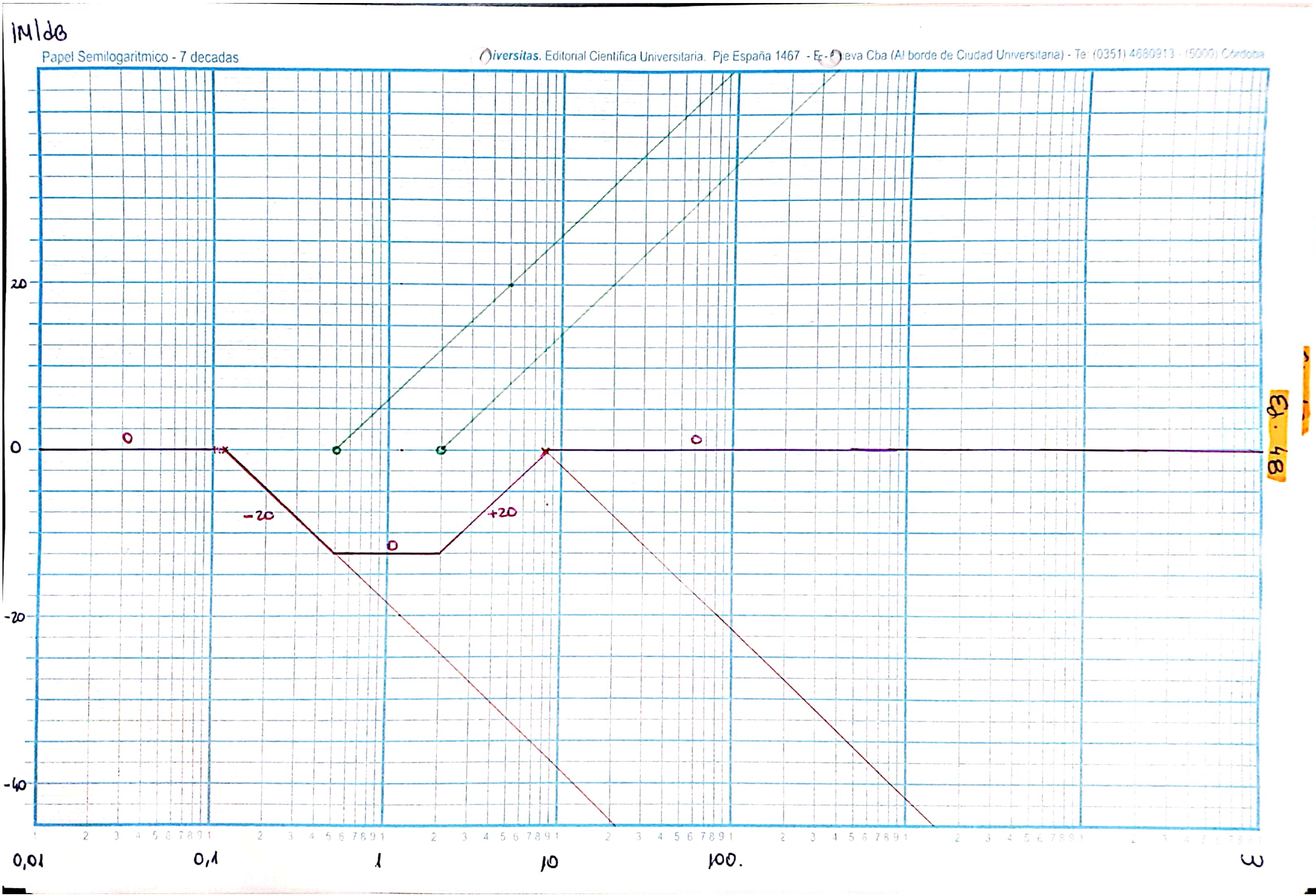
$$F(P) = \frac{2 \cdot P^2}{2(P+1)(P+4)} = \frac{P^2}{(P+1)(P+4)} = \frac{0{,}25\ P^2}{\left(\frac{P}{1}+1\right)\left(\frac{P}{4}+1\right)}$$

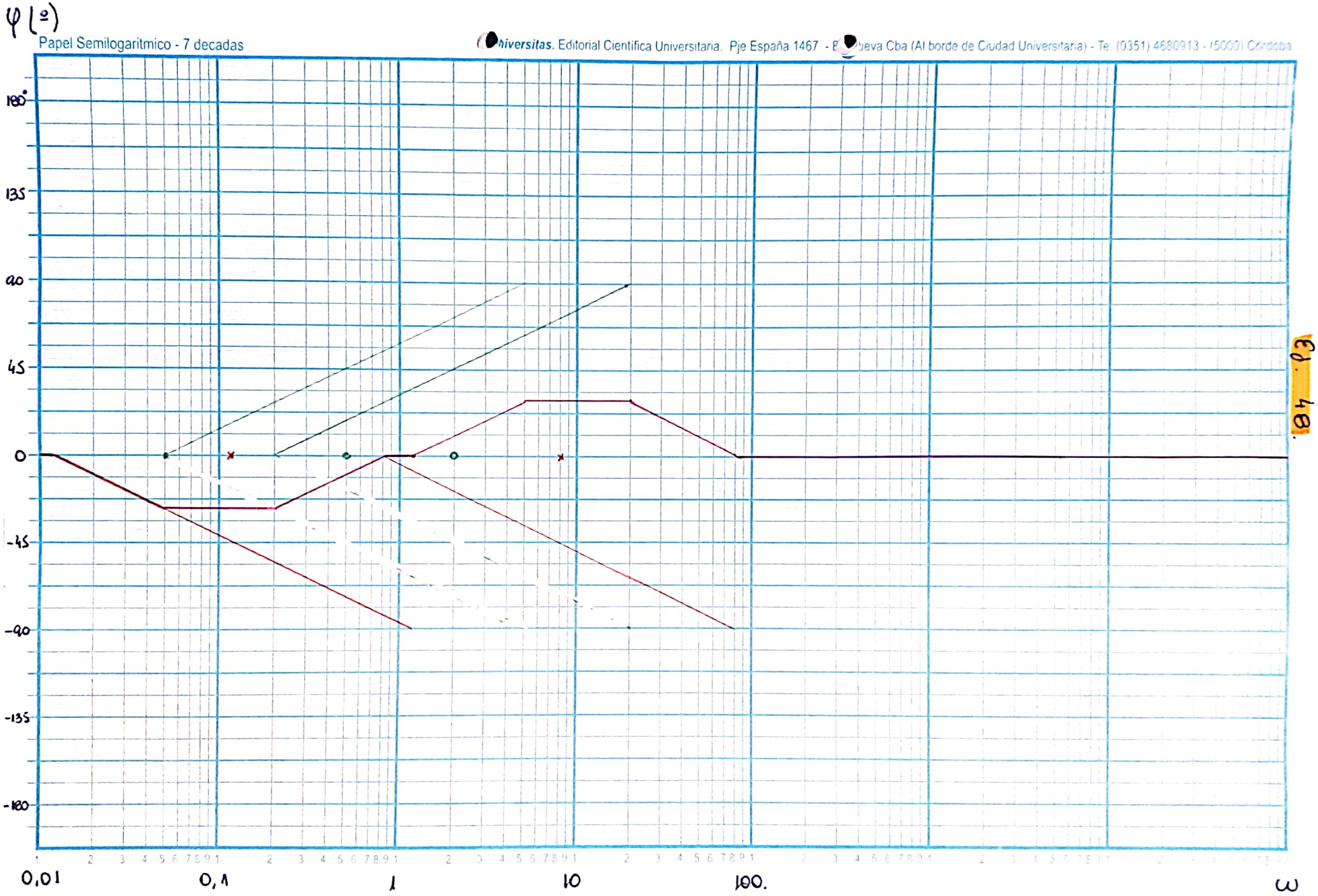
$$|F(P)|_{dB} = \underbrace{20 \log 0{,}25}_{-12{,}04\,dB} + 20 \log \omega^2 - 20 \log \sqrt{\left(\frac{\omega}{1}\right)^2 + 1} - 20 \log \sqrt{\left(\frac{\omega}{4}\right)^2 + 1}$$

$$\angle F(P) = 180^\circ - tg^{-1}\left(\frac{\omega}{1}\right) - tg^{-1}\left(\frac{\omega}{4}\right)$$









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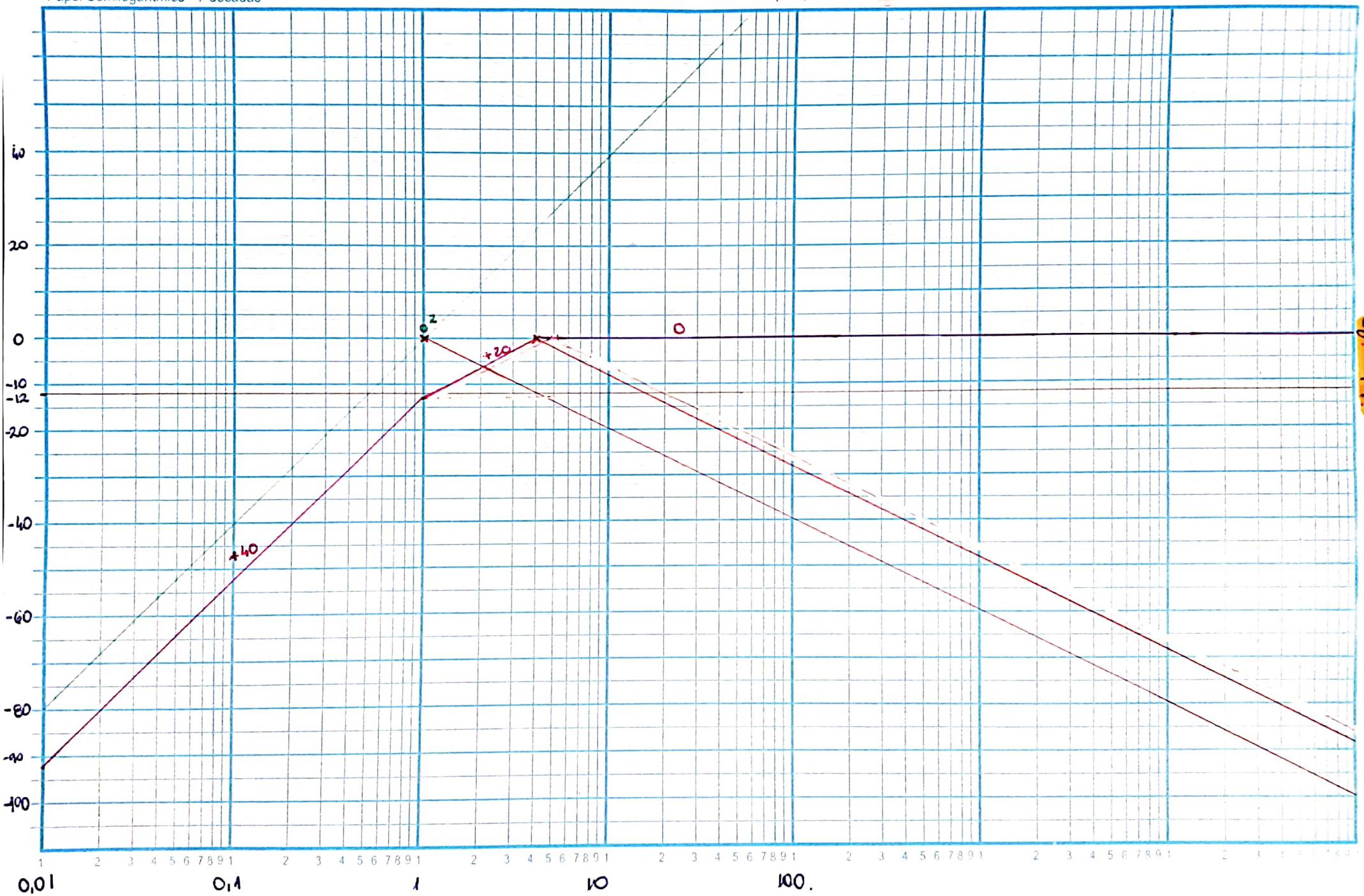
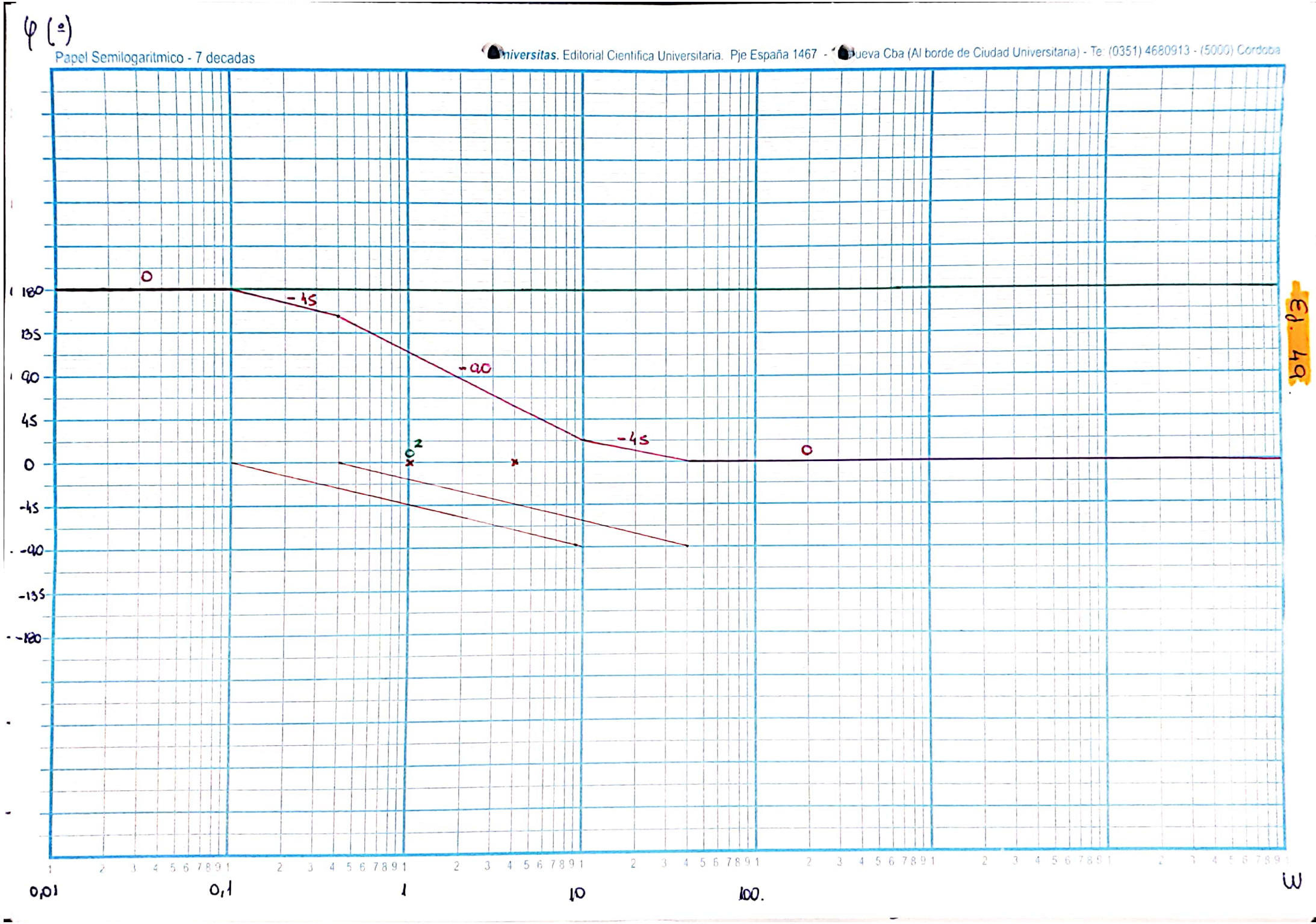




50) Trazar diagrama de BODE de :

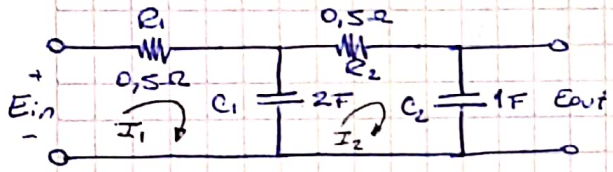
$$F(p) = \frac{10\,(p+1)(p+10)}{(p+2)(p+5)} = \frac{10\times 10\left(p+1\right)\left(\frac{p}{10}+1\right)}{2\left(\frac{p}{2}+1\right)5\left(\frac{p}{5}+1\right)}$$

$$F(p) = \frac{10\left(\frac{p}{1}+1\right)\left(\frac{p}{10}+1\right)}{\left(\frac{p}{2}+1\right)\left(\frac{p}{5}+1\right)}$$

$$|F(p)|_{dB} = \underbrace{20\log 10}_{20dB} + 20\log\sqrt{\left(\frac{\omega}{1}\right)^2+1} + 20\log\sqrt{\left(\frac{\omega}{10}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{2}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{5}\right)^2+1}$$

$$\underline{F(p)} = tg^{-1}\left(\frac{\omega}{1}\right) + tg^{-1}\left(\frac{\omega}{10}\right) - tg^{-1}\left(\frac{\omega}{2}\right) - tg^{-1}\left(\frac{\omega}{5}\right)$$

51) Encontrar $F(p)$ y trazar BODE de magn. y fase.



$$z_{11} = R_1 + \frac{1}{C_1 p} = 0{,}5 + \frac{1}{2p} = \frac{p+1}{2p}$$

$$z_{12} = -\frac{1}{C_1 p} = -\frac{1}{2p}$$

$$z_{22} = R_2 + \frac{1}{C_1 p} + \frac{1}{C_2 p} = \frac{p+3}{2p}$$

$$\begin{bmatrix} \frac{p+1}{2p} & -\frac{1}{2p} \\ -\frac{1}{2p} & \frac{p+3}{2p} \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} E_{in} \\ 0 \end{bmatrix}$$

$$F(p) = -\Delta_{12}\cdot\frac{1}{C_2 p}\cdot\frac{1}{\Delta p}$$

- $\Delta_{12} = -\frac{1}{2p}$

- $\Delta p = \frac{(p+3)(p+1)}{4p^2} - \frac{1}{4p^2} = \frac{p^2+4p+3-1}{4p^2} = \frac{p^2+4p+2}{4p^2}$

$$F(p) = \frac{1}{2p}\cdot\frac{1}{p}\cdot\frac{4p^2}{p^2+4p+2} = \frac{2}{(p+0{,}586)(p+3{,}414)}$$

$$F(p) = \frac{1}{\left(\frac{p}{0{,}586}+1\right)\left(\frac{p}{3{,}414}+1\right)}$$

$$|F(p)|_{dB} = -20\log\left(\sqrt{\left(\frac{\omega}{0{,}586}\right)^2+1}\right) - 20\log\sqrt{\left(\frac{\omega}{3{,}414}\right)^2+1}$$

$$\underline{F(p)} = -tg^{-1}\left(\frac{\omega}{0{,}586}\right) - tg^{-1}\left(\frac{\omega}{3{,}414}\right)$$

52) Trazar BODE de magn. y fase de:

$$F(p) = \frac{20 \cdot p \cdot (p+5)}{(p+1)(p+10)}$$

$$F(p) = \frac{20 \cdot 5 \cdot p \left(\frac{p}{5}+1\right)}{\left(\frac{p}{1}+1\right) 10 \left(\frac{p}{10}+1\right)}$$

$$F(p) = \frac{10 \cdot p \left(\frac{p}{5}+1\right)}{\left(\frac{p}{1}+1\right)\left(\frac{p}{10}+1\right)}$$

$$|F(p)|_{dB} = \underbrace{20\log(10)}_{20dB} + 20\log(w) + 20\log\left(\sqrt{\left(\frac{w}{5}\right)^2+1}\right) - 20\log\sqrt{\left(\frac{w}{1}\right)^2+1} + \dots$$

$$\dots - 20\log\sqrt{\left(\frac{w}{10}\right)^2+1}$$

$$\underline{|F(p)|} = 90^\circ + tg^{-1}\left(\frac{w}{5}\right) - tg^{-1}\left(\frac{w}{1}\right) - tg^{-1}\left(\frac{w}{10}\right)$$

53) Trazar BODE de magn. y fase de:

$$F(p) = \frac{4(p+2)(p+5)}{p^2(p+10)} = \frac{4 \cdot 2\left(\frac{p}{2}+1\right)5\left(\frac{p}{5}+1\right)}{p^2 \cdot 10\left(\frac{p}{10}+1\right)}$$

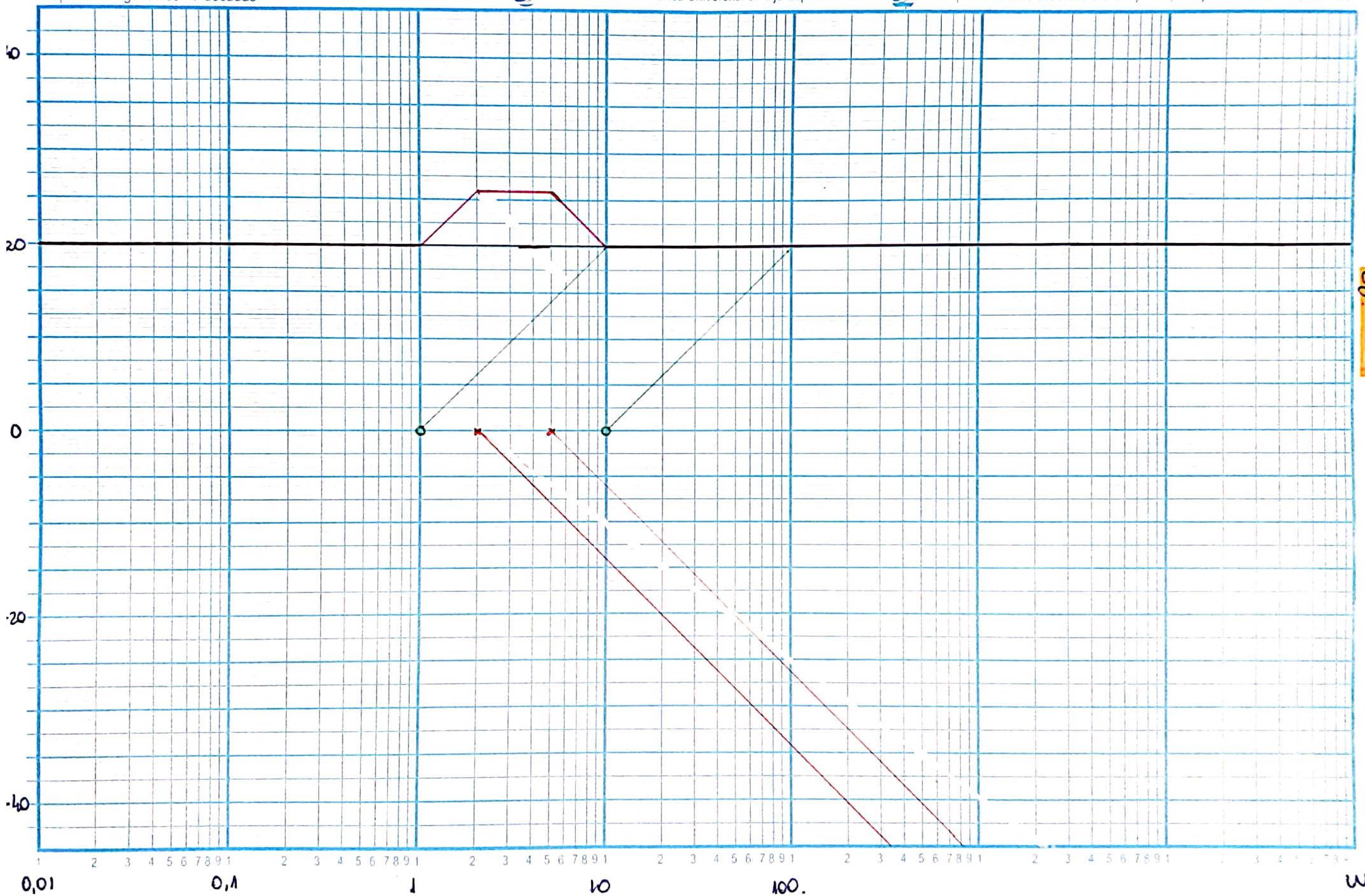
$$F(p) = \frac{4\left(\frac{p}{2}+1\right)\left(\frac{p}{5}+1\right)}{p^2\left(\frac{p}{10}+1\right)}$$

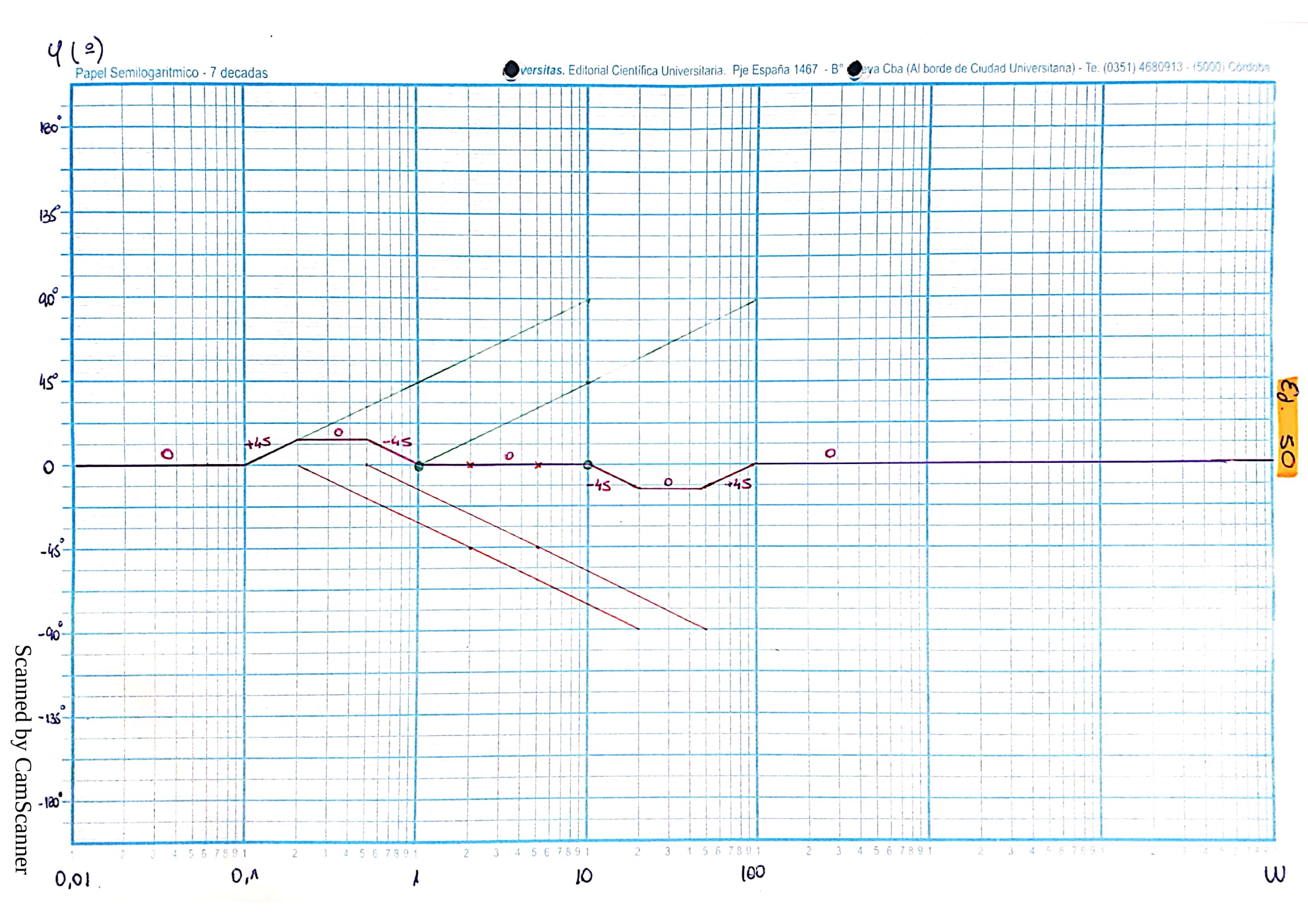
$$|F(p)|_{dB} = \underbrace{20\log 4}_{12,04dB} + 20\log\sqrt{\left(\frac{w}{2}\right)^2+1} + 20\log\sqrt{\left(\frac{w}{5}\right)^2+1} - 40\log w - 20\log\sqrt{\left(\frac{w}{10}\right)^2+1}$$

$$\underline{|F(p)|} = -180^\circ + tg^{-1}\left(\frac{w}{2}\right) + tg^{-1}\left(\frac{w}{5}\right) - tg^{-1}\left(\frac{w}{10}\right)$$

|M|dB

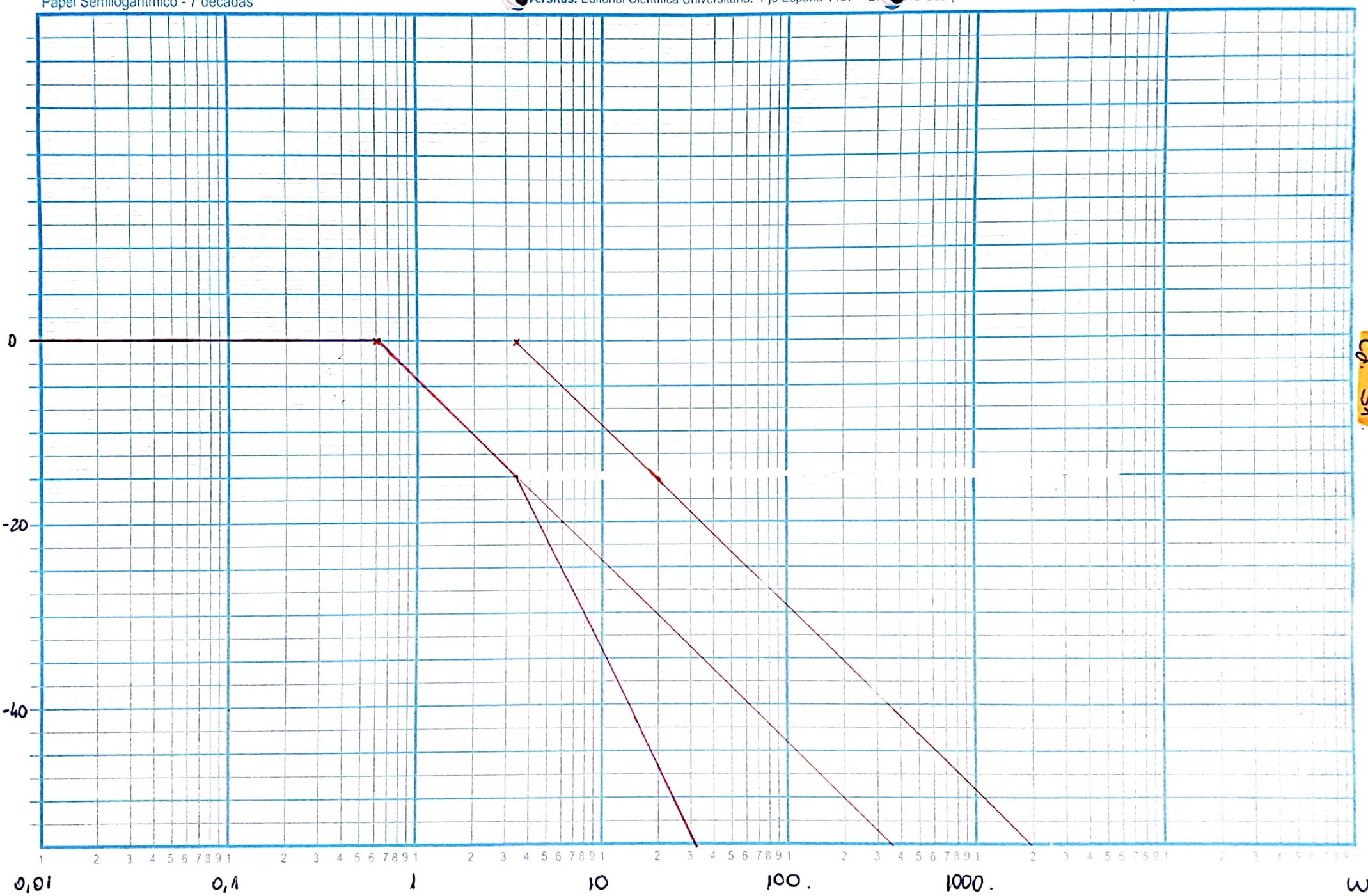
Papel Semilogaritmico - 7 decadas





|M|dB.

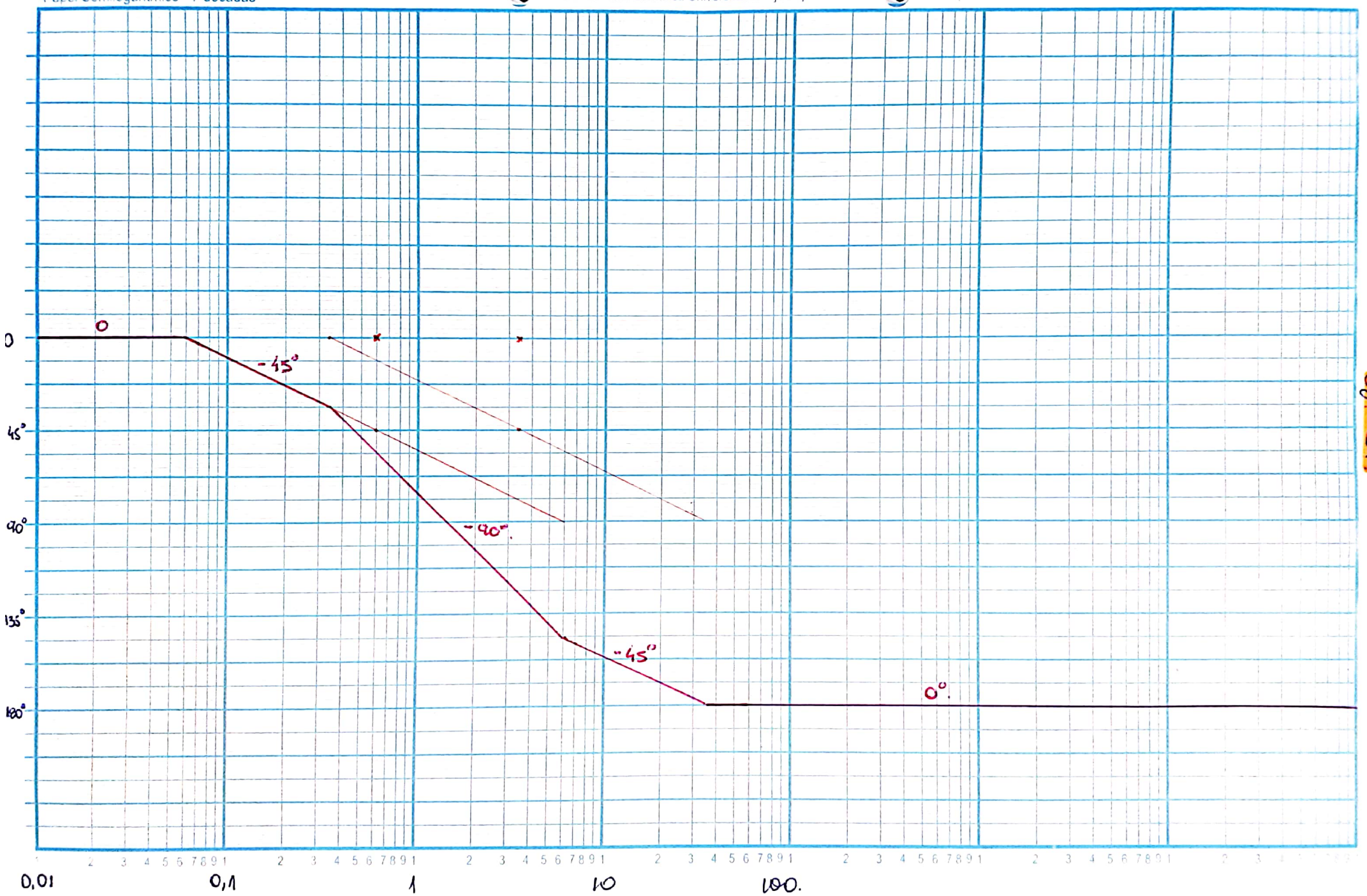
Papel Semilogaritmico - 7 decadas

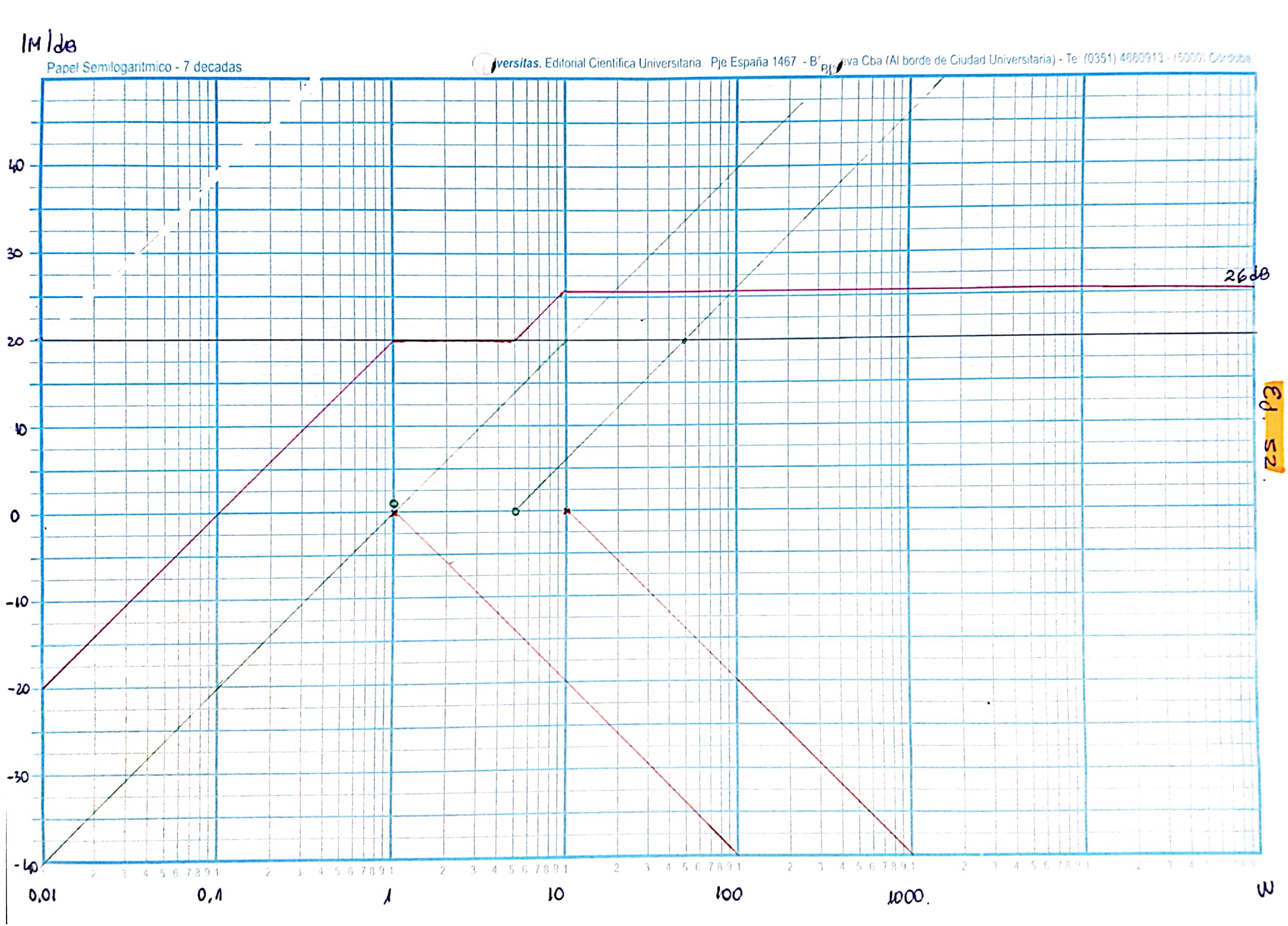


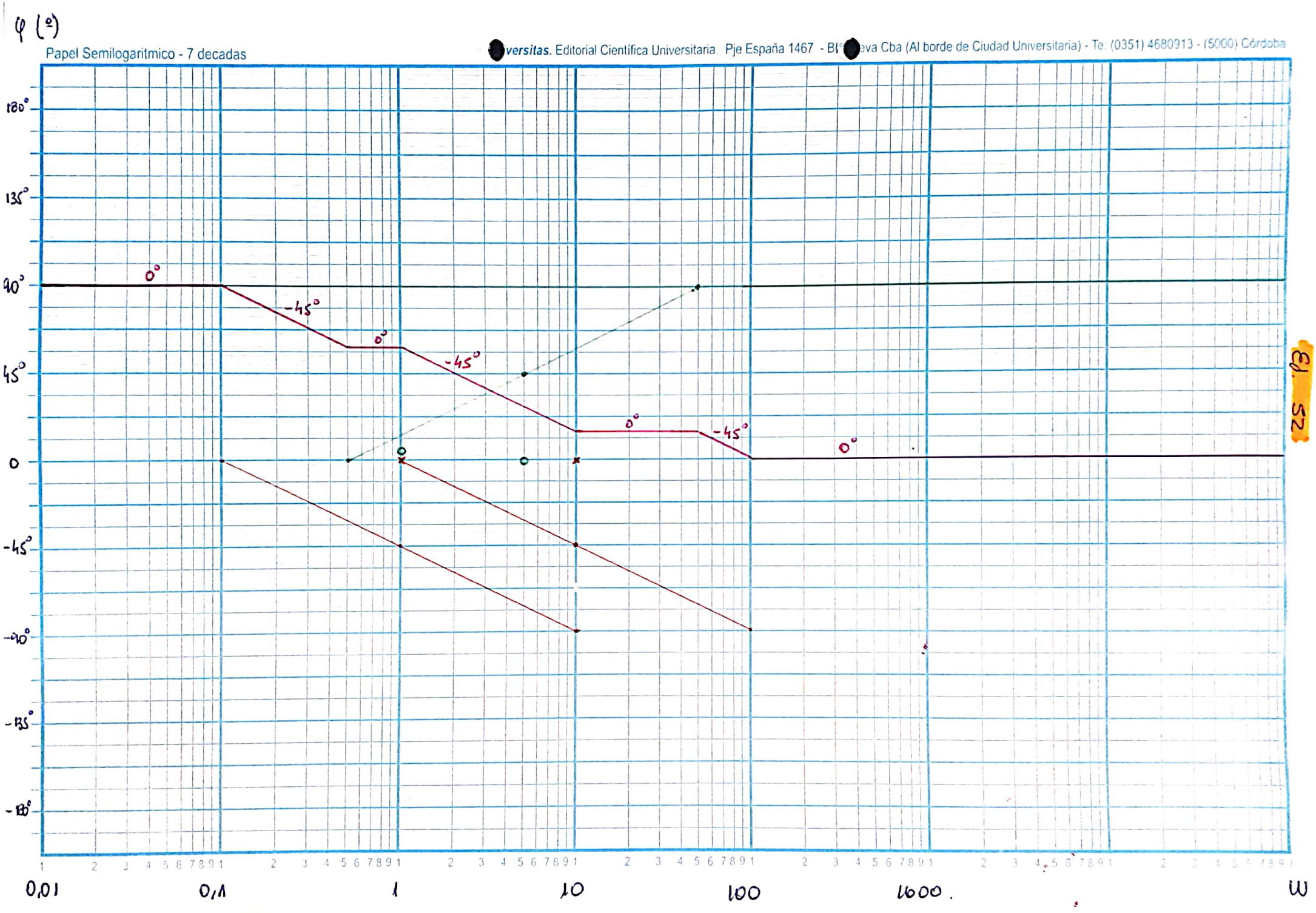
Eq. 54

$\varphi(^\circ)$

Papel Semilogaritmico - 7 decadas







|M|dB

Papel Semilogaritmico - 7 decadas

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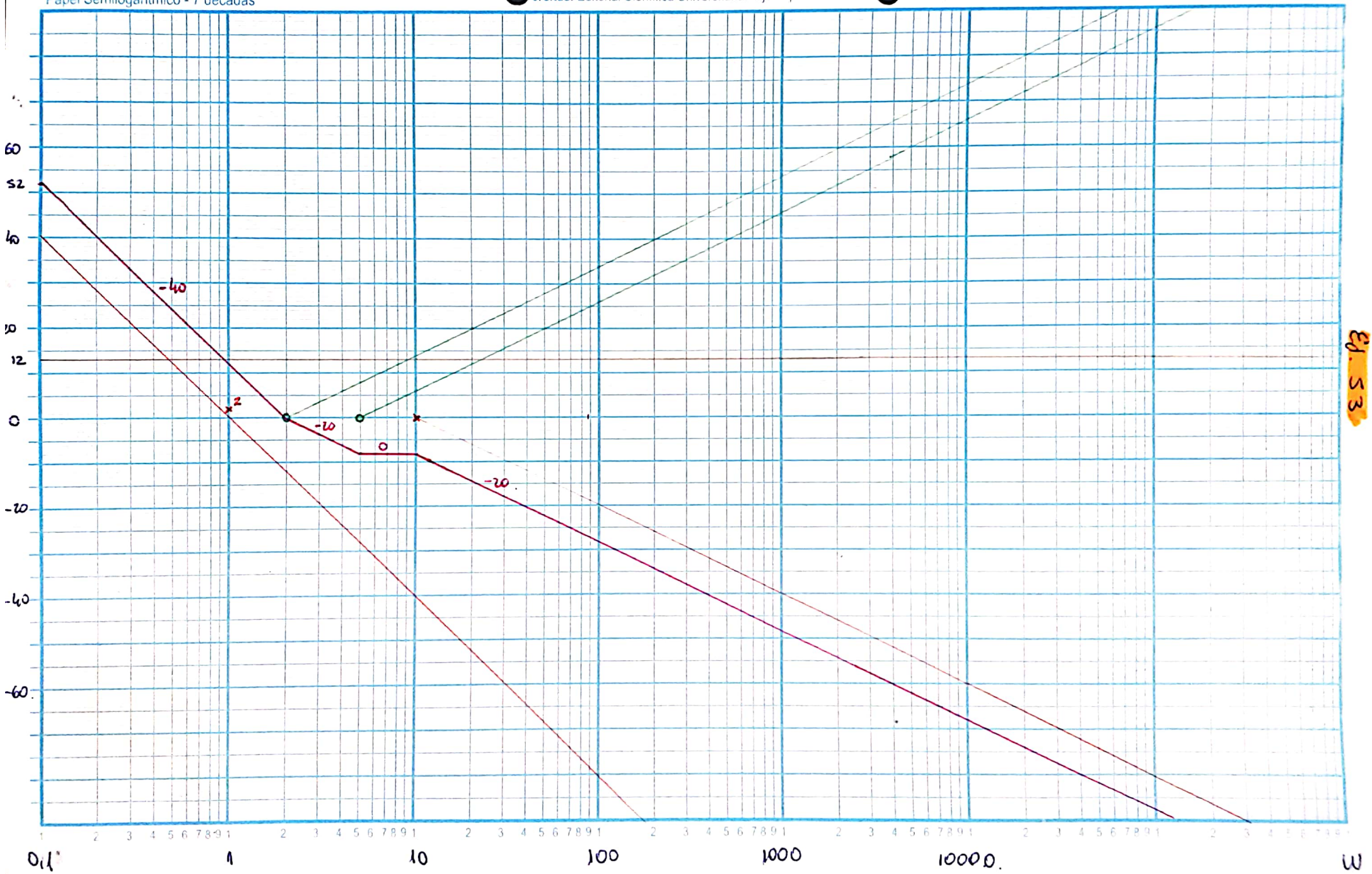
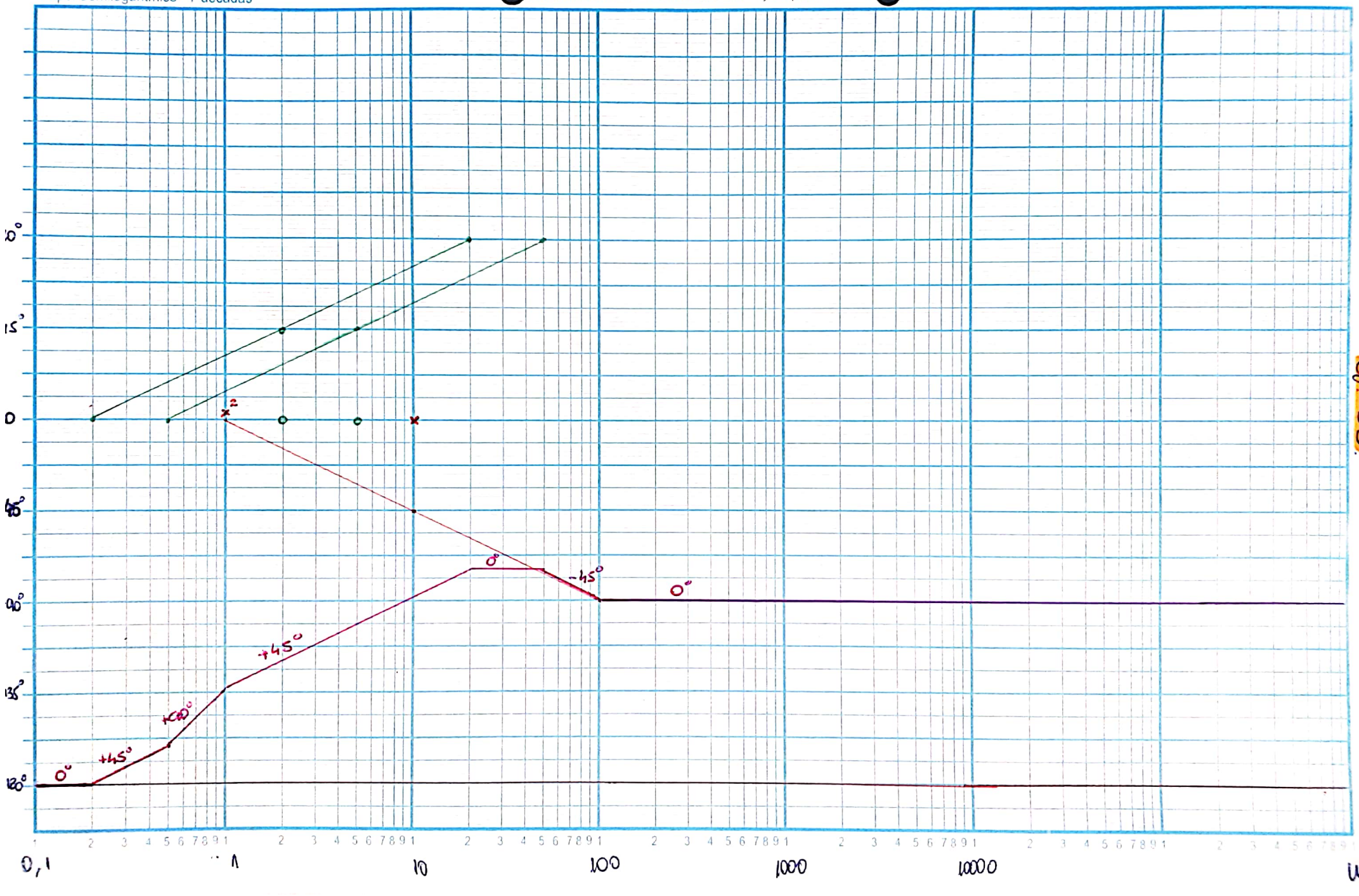


Ej. 53

4 (a)



Ej. 53.

54) Trazar Bode de magn. y fase de:

$$F(p) = \frac{5(p+1)(p+2)(p+10)}{p^3(p+20)}$$

$$F(p) = \frac{5 \cdot 2 \cdot 10 (p+1)\left(\frac{p}{2}+1\right)\left(\frac{p}{10}+1\right)}{p^3 \cdot 20\left(\frac{p}{20}+1\right)} = \frac{5(p+1)\left(\frac{p}{2}+1\right)\left(\frac{p}{10}+1\right)}{p^3\left(\frac{p}{20}+1\right)}$$

$$|F(p)|_{dB} = \overbrace{20\log 5}^{13,98 \cong 14dB} + 20\log\sqrt{(w)^2+1} + 20\log\sqrt{\left(\frac{w}{2}\right)^2+1} + 20\log\sqrt{\left(\frac{w}{10}\right)^2+1} + \dots - 20\log w^3 - 20\log\sqrt{\left(\frac{w}{20}\right)^2+1}$$

$$\underline{|F(p)} = -270° + tg^{-1}\left(\frac{w}{1}\right) + tg^{-1}\left(\frac{w}{2}\right) + tg^{-1}\left(\frac{w}{10}\right) - tg^{-1}\left(\frac{w}{20}\right)$$

55) Trazar Bode de magn. y fase de:

$$F(p) = \frac{15(p+2)(p+10)}{(p+1)(p+20)}$$

$$F(p) = \frac{15\left(\frac{p}{2}+1\right)\left(\frac{p}{10}+1\right)}{(p+1)\left(\frac{p}{20}+1\right)}$$

$$|F(p)|_{dB} = \overbrace{20\log 15}^{23,52\,dB} + 20\log\sqrt{\left(\frac{w}{2}\right)^2+1} + 20\log\sqrt{\left(\frac{w}{10}\right)^2+1} - 20\log\sqrt{(w)^2+1} - 20\log\sqrt{\left(\frac{w}{20}\right)^2+1}$$

$$\underline{|F(p)} = tg^{-1}\left(\frac{w}{2}\right) + tg^{-1}\left(\frac{w}{10}\right) - tg^{-1}(w) - tg^{-1}\left(\frac{w}{20}\right)$$

56) Trazar BODE de magn. y fase de:

$$F(p) = \frac{100}{p(p+5)(p+10)} = \frac{2}{p\left(\frac{p}{5}+1\right)\left(\frac{p}{10}+1\right)}$$

$$|F(p)|_{dB} = \underbrace{20\log 2}_{6,02dB} - 20\log w - 20\log\sqrt{\left(\frac{w}{5}\right)^2+1} - 20\log\sqrt{\left(\frac{w}{10}\right)^2+1}$$

$$\underline{|F(p)} = -90° - tg^{-1}\left(\frac{w}{5}\right) - tg^{-1}\left(\frac{w}{10}\right)$$

57) Trazar Bode de magn. y fase de:

$$F(p) = \frac{20\,p\,(p+5)}{(p+1)(p+10)}$$

$$F(p) = \frac{10\,p\left(\frac{p}{5}+1\right)}{(p+1)\left(\frac{p}{10}+1\right)}$$

$$|F(p)|_{dB} = \underbrace{20\log 10}_{20dB} + 20\log\omega + 20\sqrt{\left(\frac{\omega}{5}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{1}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{10}\right)^2+1}$$

$$\underline{|F(p)} = 90° + tg^{-1}\left(\frac{\omega}{5}\right) - tg^{-1}(\omega) - tg^{-1}\left(\frac{\omega}{10}\right)$$

58) Trazar Bode de magn. y fase de:

$$F(p) = \frac{4\,(p+2)\,(p+5000)}{(p+20)\,(p+1000)}$$

$$F(p) = \frac{2\left(\frac{p}{2}+1\right)\left(\frac{p}{5000}+1\right)}{\left(\frac{p}{20}+1\right)\left(\frac{p}{1000}+1\right)}$$

$$|F(p)|_{dB} = \underbrace{20\log 2}_{6,02dB} + 20\log\sqrt{\left(\frac{\omega}{2}\right)^2+1} + 20\log\sqrt{\left(\frac{\omega}{5000}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{20}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{1000}\right)^2+1}$$

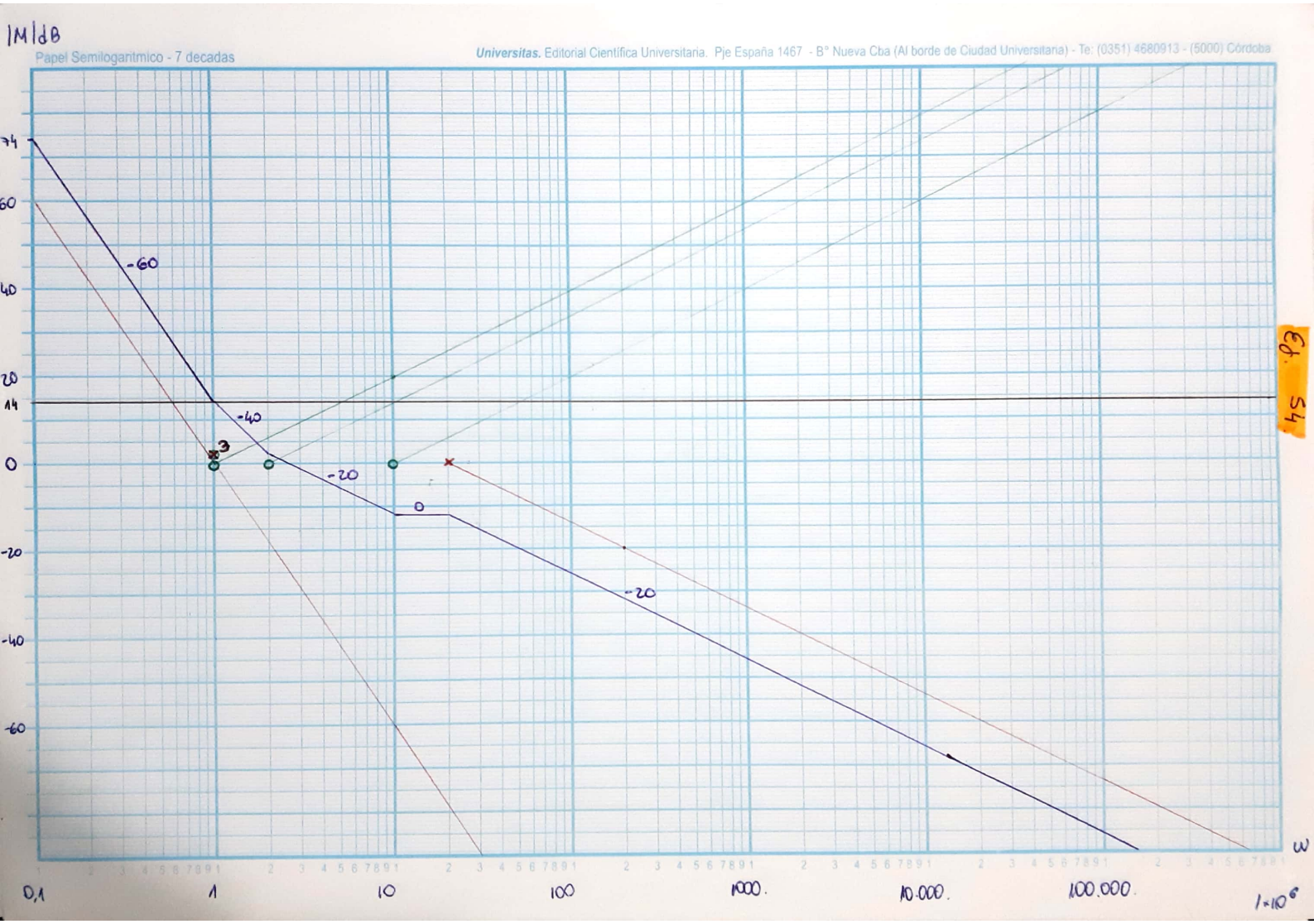
$$\underline{|F(p)} = tg^{-1}\left(\frac{\omega}{2}\right) + tg^{-1}\left(\frac{\omega}{5000}\right) - tg^{-1}\left(\frac{\omega}{20}\right) - tg^{-1}\left(\frac{\omega}{1000}\right)$$

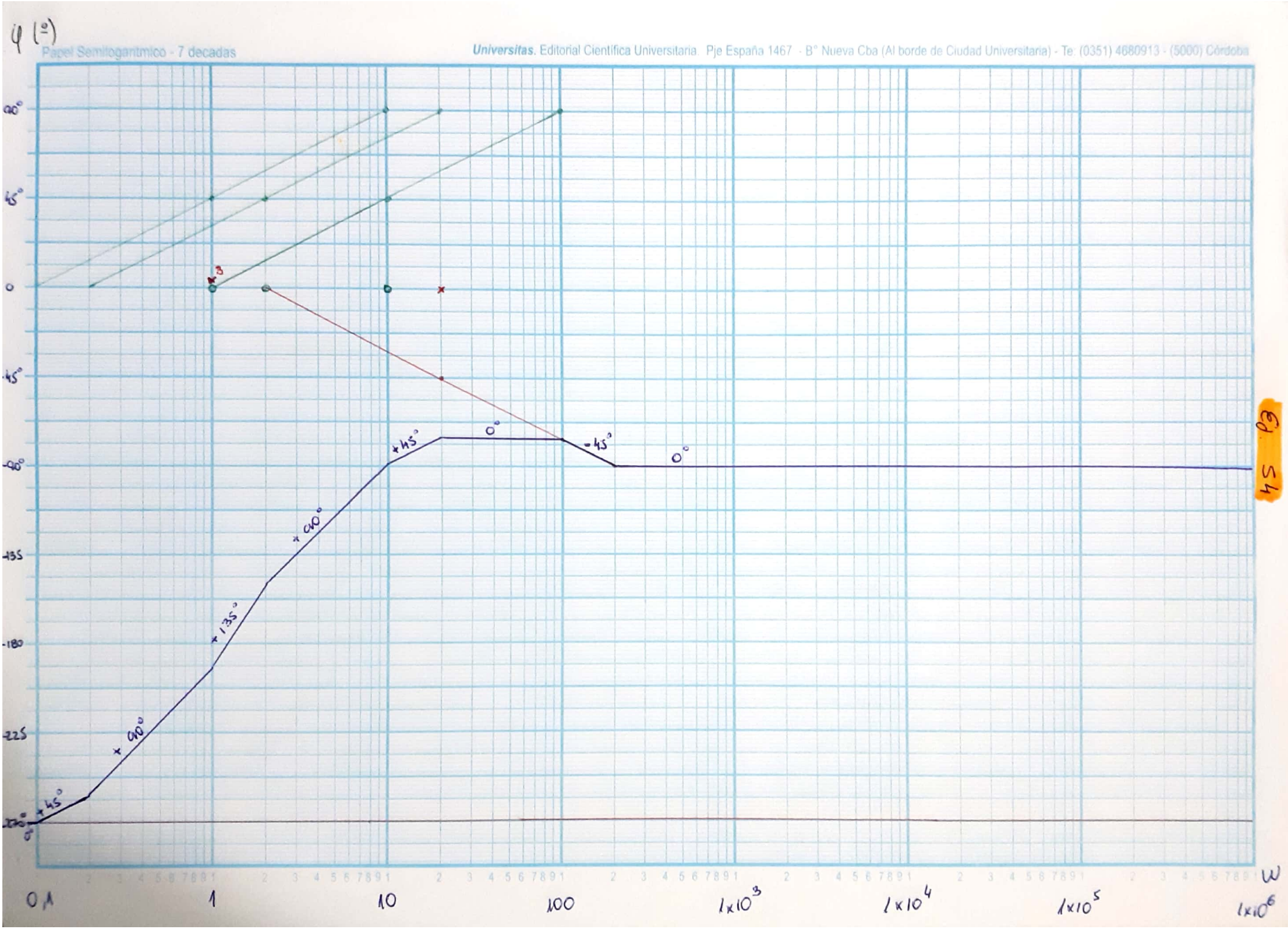
59) Trazar Bode de magn. y fase de:

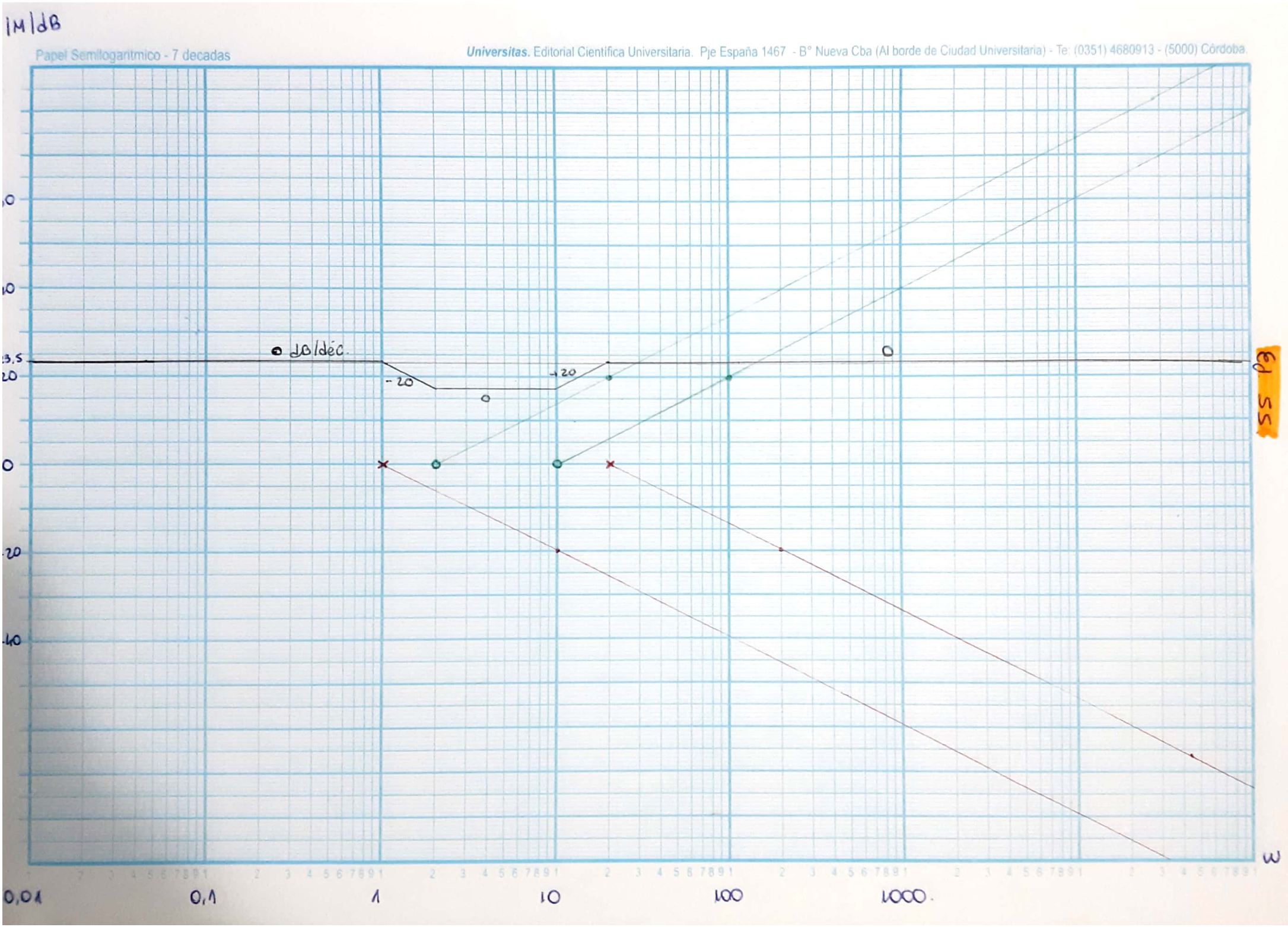
$$F(p) = \frac{p^2\,(p+100)\,(p+1000)\,(p+8000)^2}{(p+10)^3\,(p+2000)^3}$$

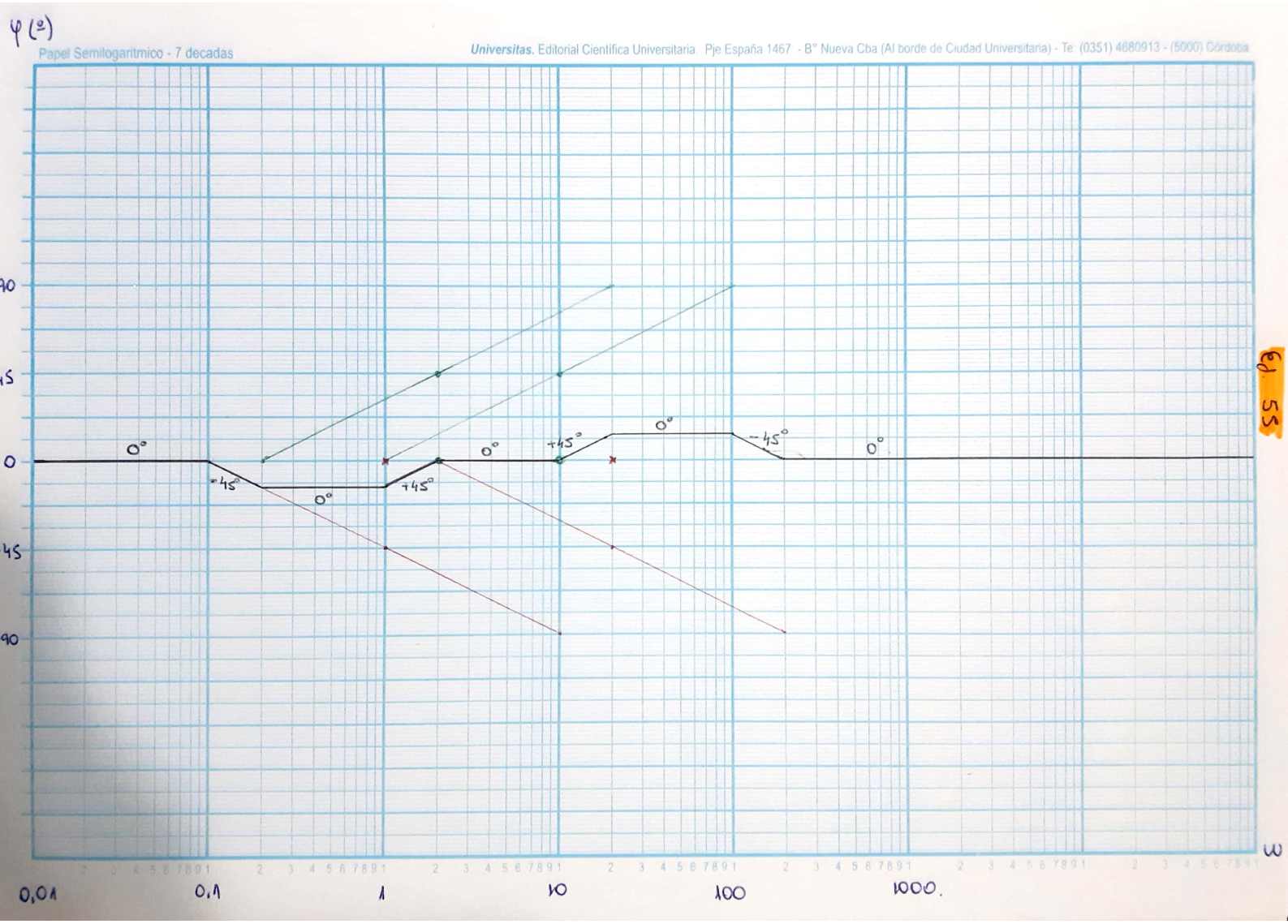
$$F(p) = \frac{0,8\cdot p^2\left(\frac{p}{100}+1\right)\left(\frac{p}{1000}+1\right)\left(\frac{p}{8000}+1\right)^2}{\left(\frac{p}{10}+1\right)^3\left(\frac{p}{2000}+1\right)^3}$$

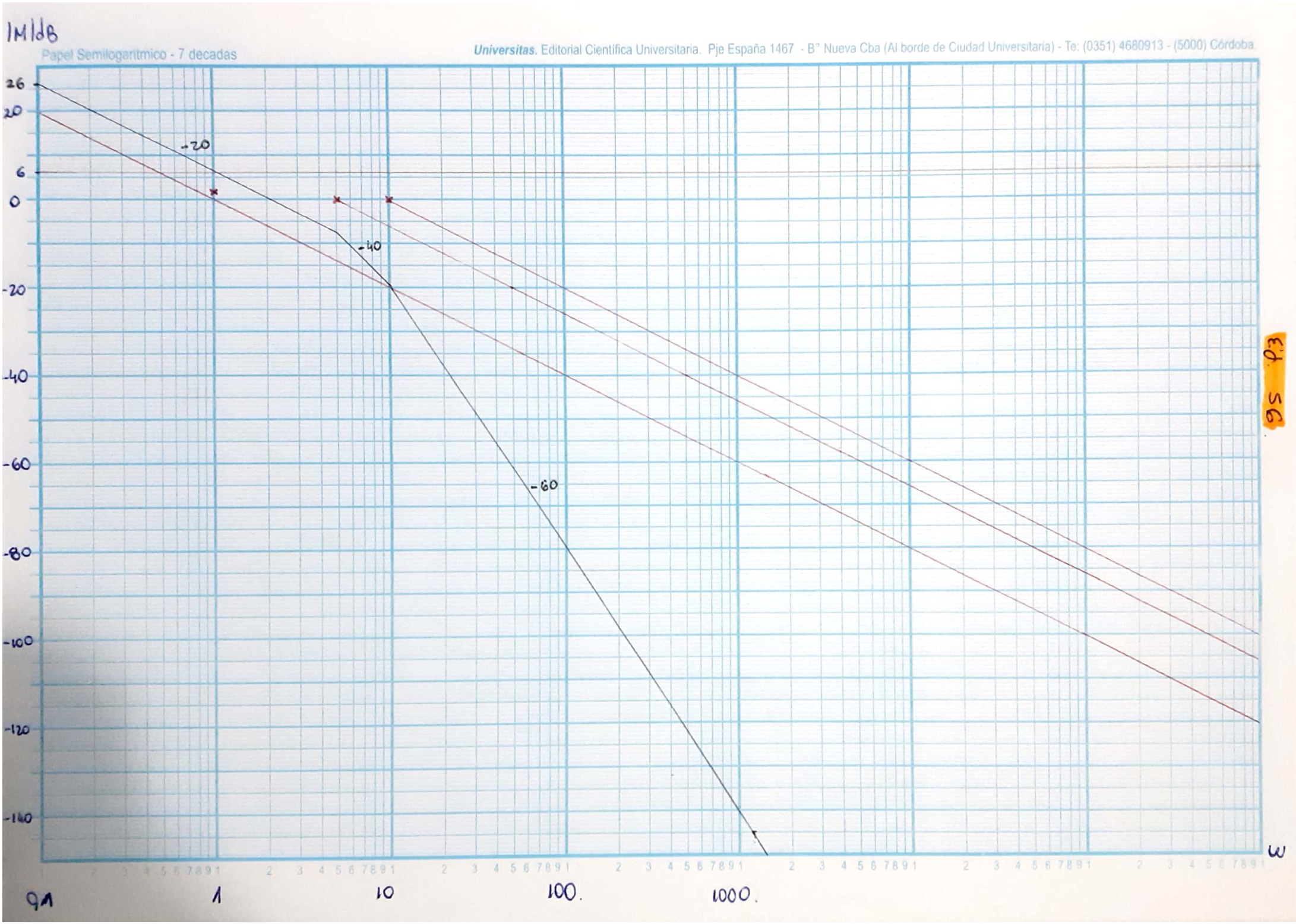
$$20\log 0,8 = -1,94dB \cong -2dB$$

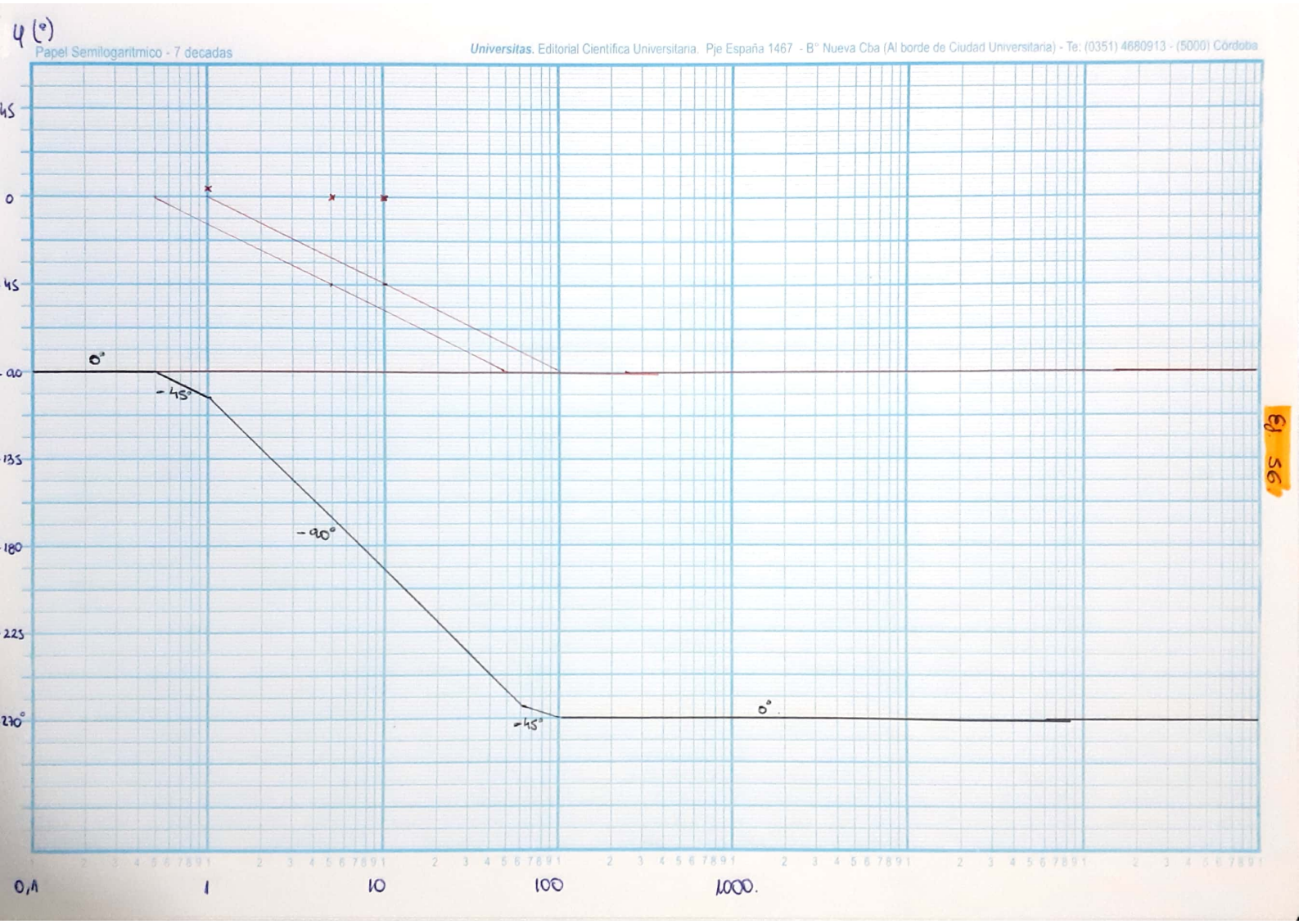


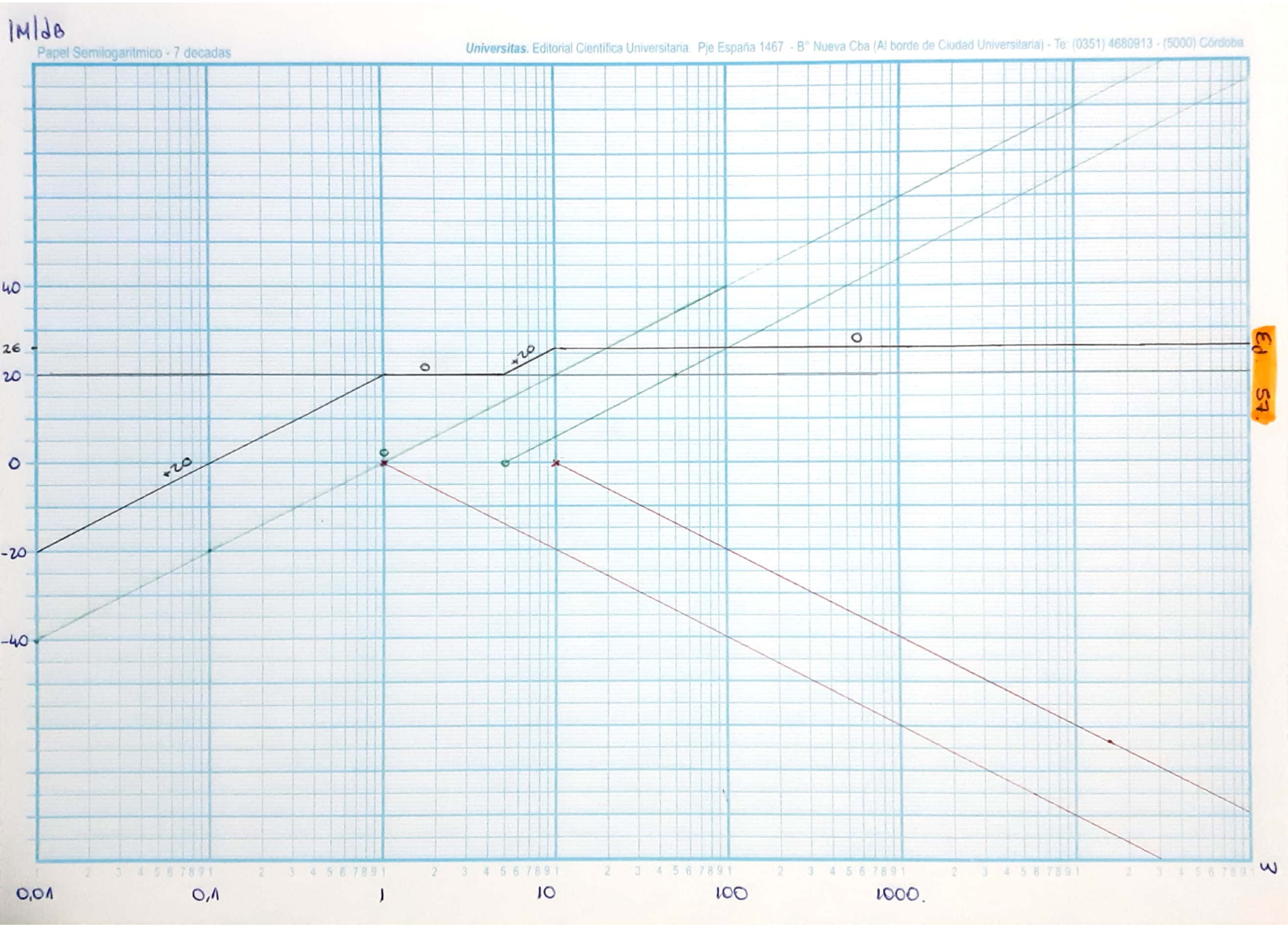


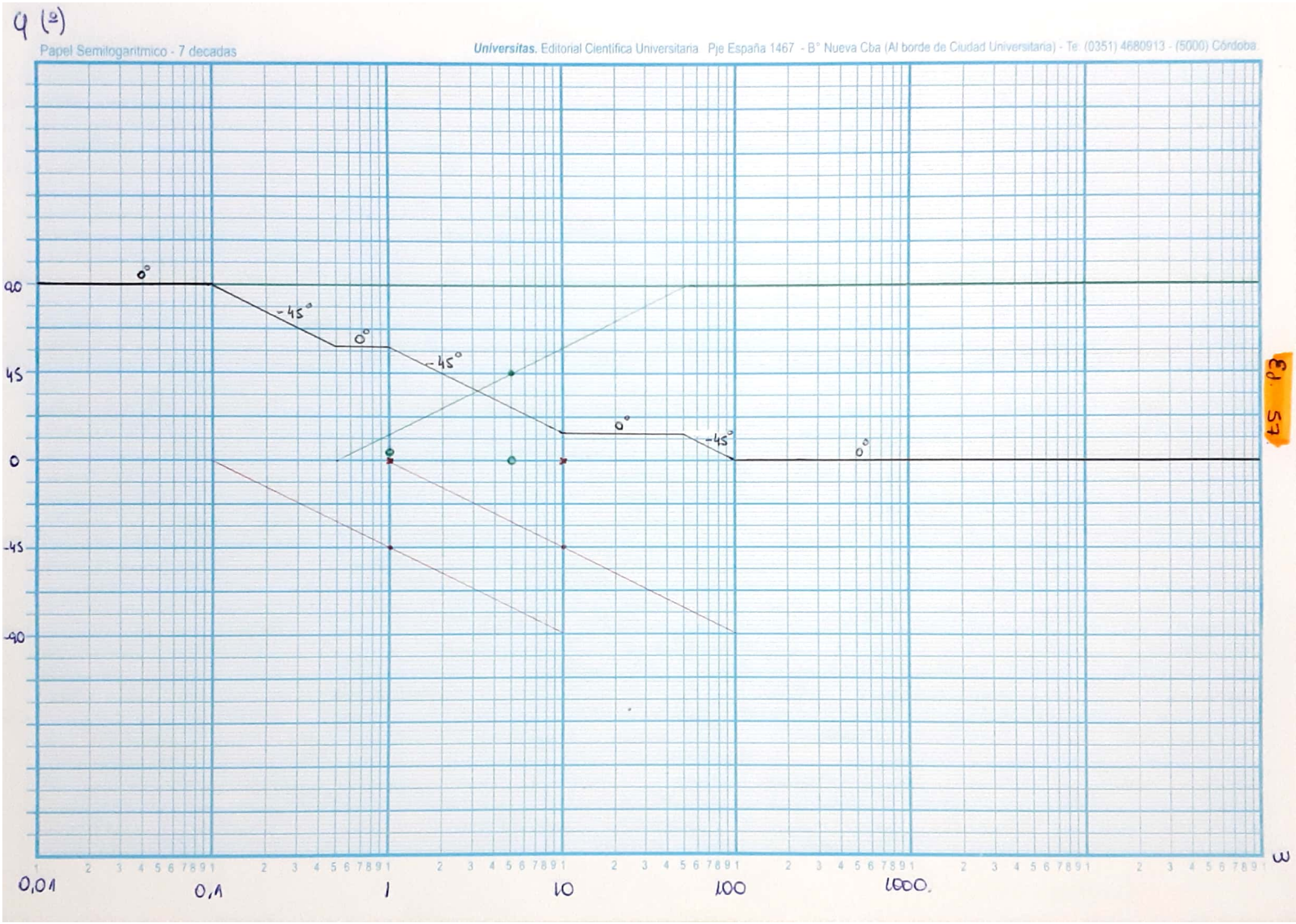


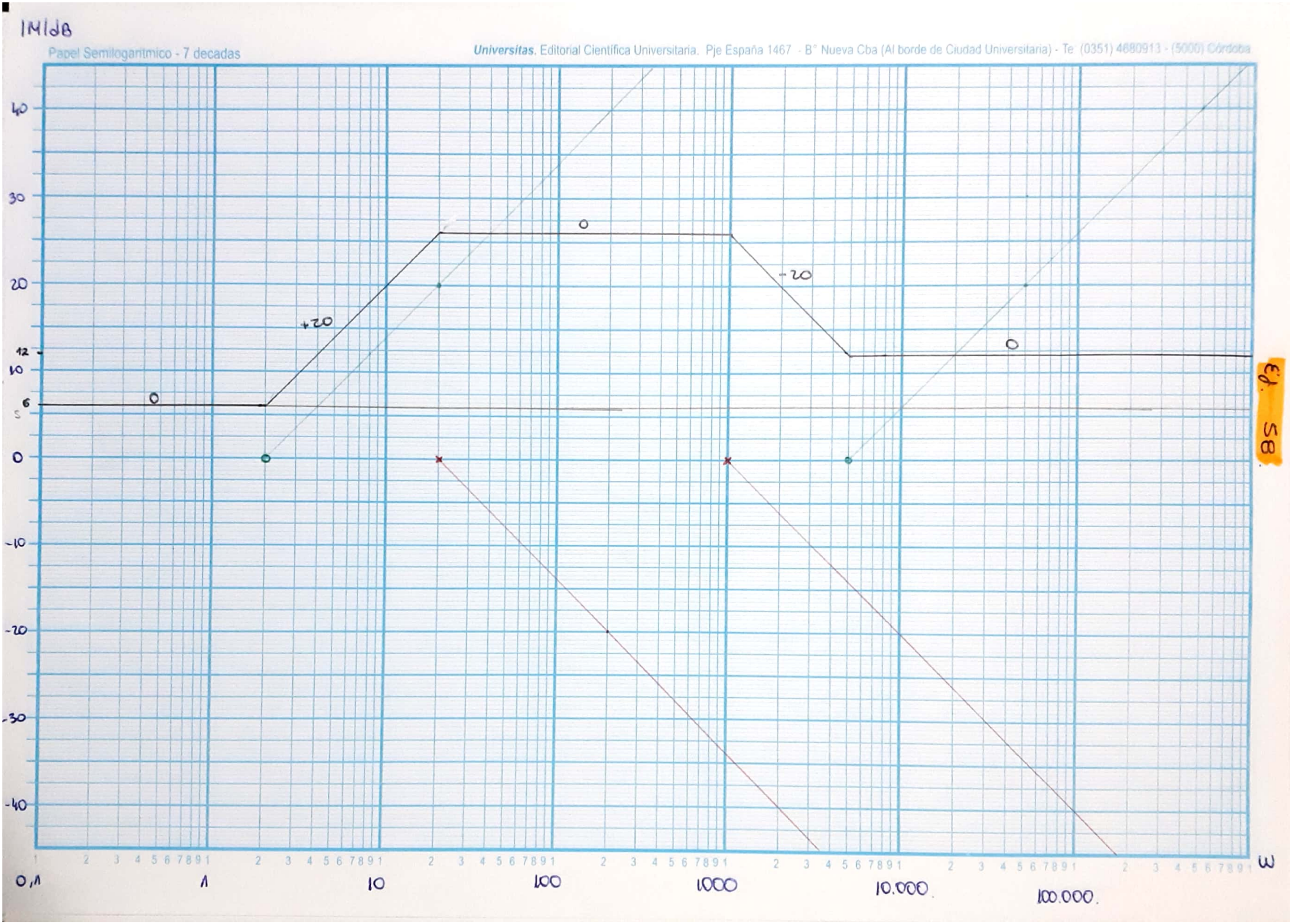


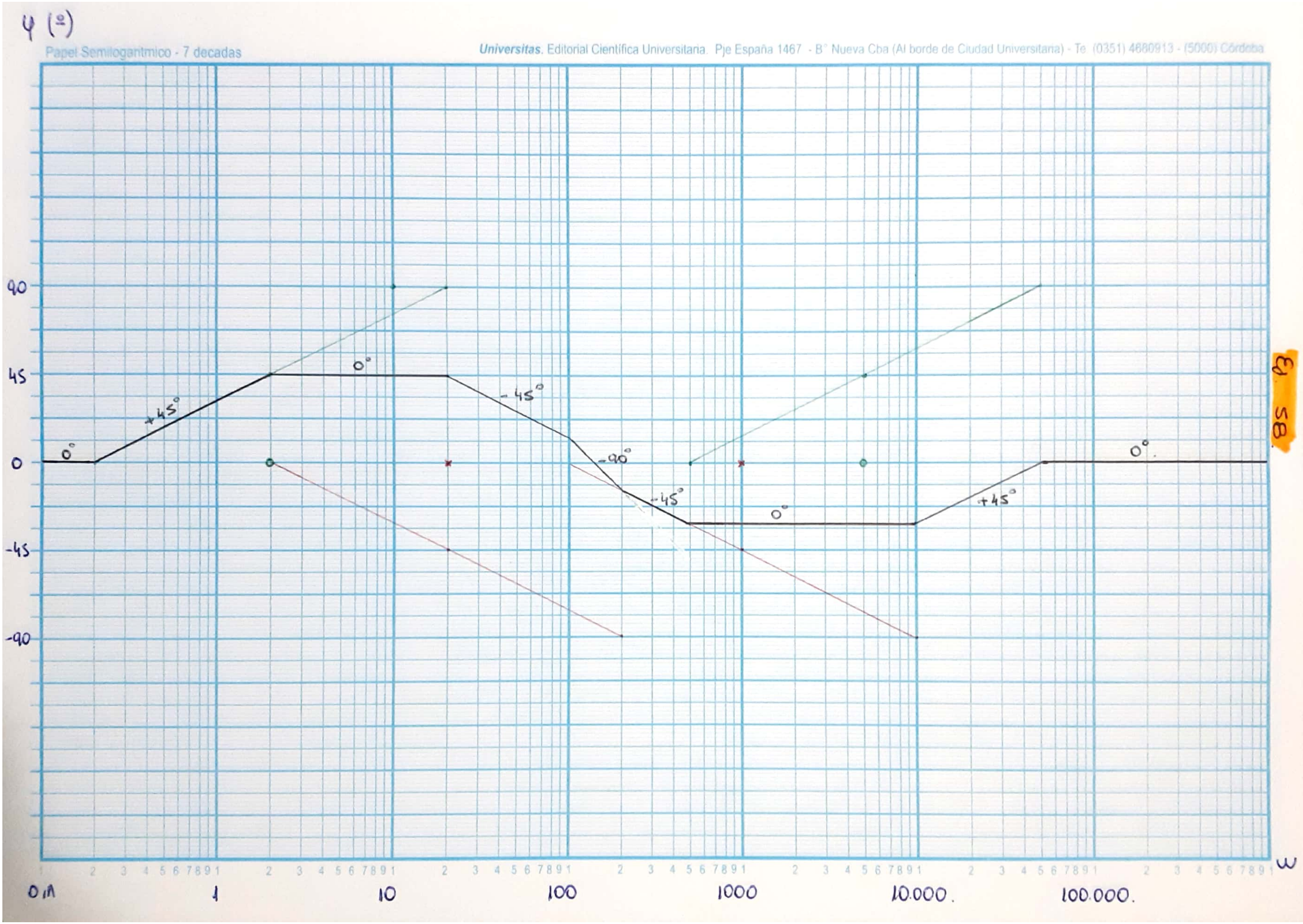


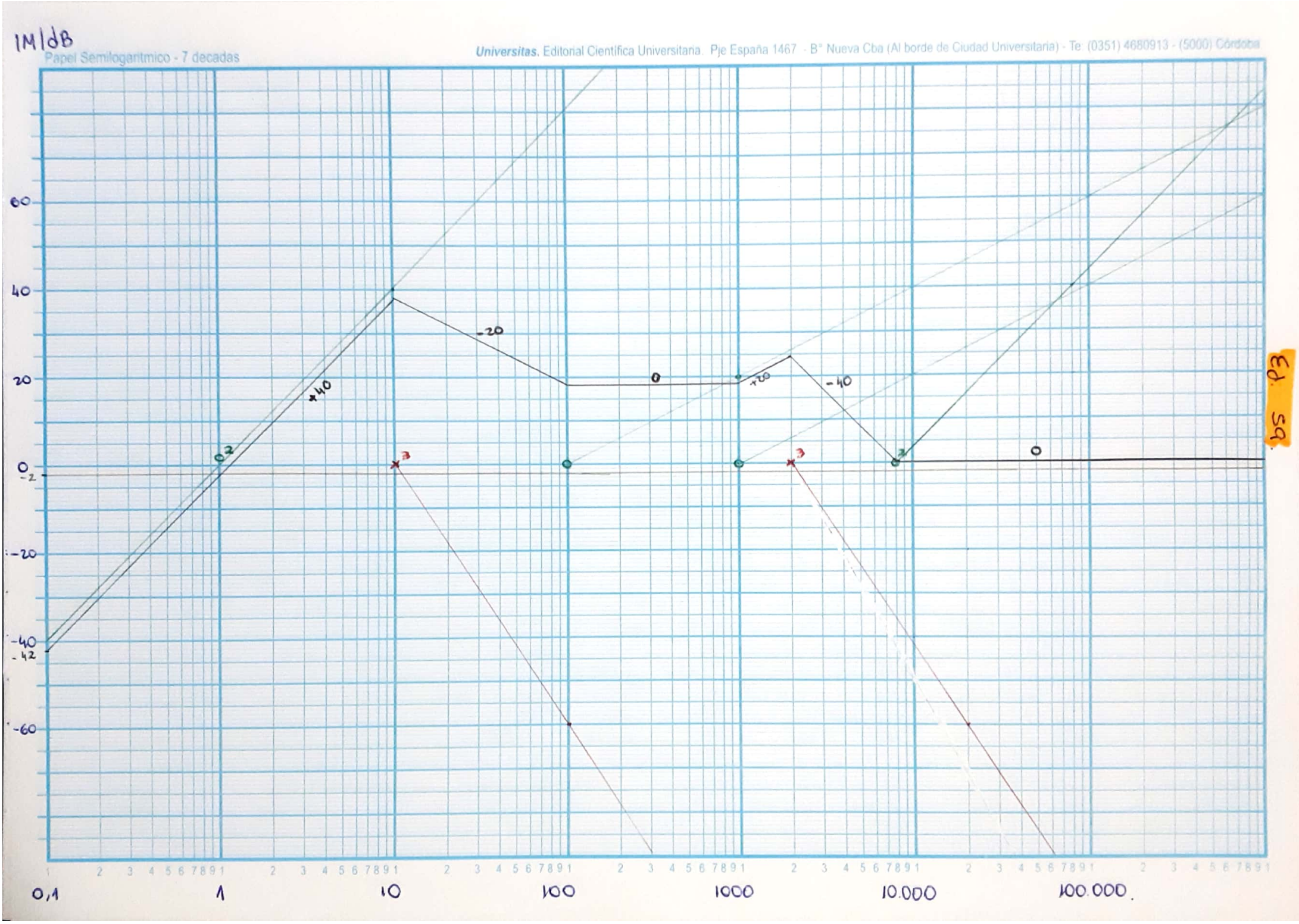


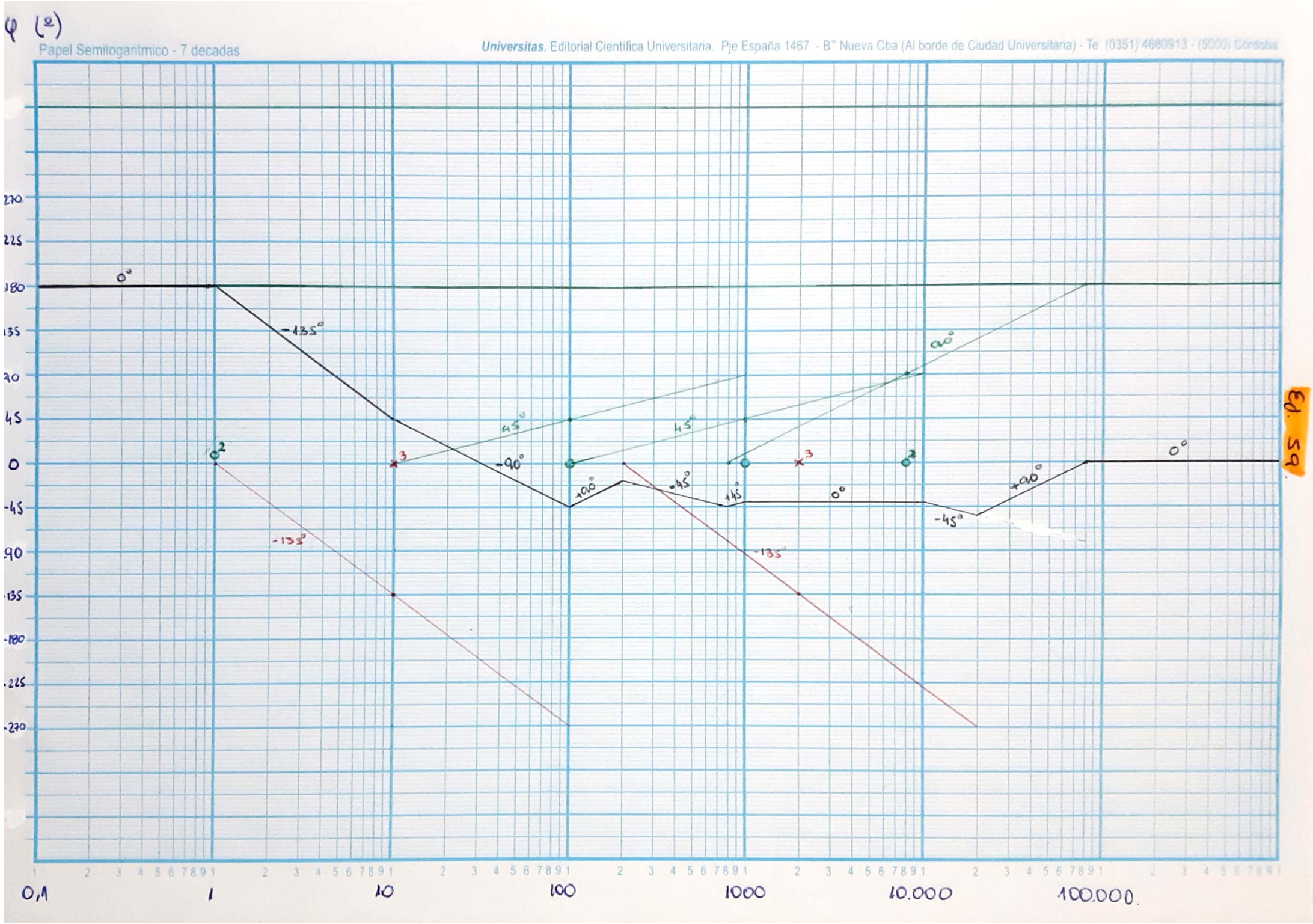












60) Trazar diagrama de Bode de magn. y fase de:

$$F(p) = \frac{20(p+1)(p+20)}{(p+4)(p^2+6p+100)}$$

$$F(p) = \frac{20\left(\frac{p}{1}+1\right)20\left(\frac{p}{20}+1\right)}{4\left(\frac{p}{4}+1\right)100\left(\frac{p^2}{100}+\frac{6p}{100}+1\right)}$$

$$F(p) = \frac{\left(\frac{p}{1}+1\right)\left(\frac{p}{20}+1\right)}{\left(\frac{p}{4}+1\right)\left(\left(\frac{p}{10}\right)^2+\frac{6}{100}p+1\right)}$$

$p^2+6p+100$

$\omega_0 = \sqrt{100} = 10$

$6 = 2\xi\omega_0 = 2\xi 10$

$\xi = 0,3$

↳ Debemos corregir

$$|F(j\omega)| = 20\log\sqrt{\frac{\omega^2}{1}+1} + 20\log\sqrt{\left(\frac{\omega}{20}\right)^2+1} - 20\log\sqrt{\left(\frac{\omega}{4}\right)^2+1} - 20\log\sqrt{\left(1-\frac{\omega^2}{100}\right)^2+\left(\frac{6\omega}{100}\right)^2}$$

$$\underline{F(j\omega)} = tg^{-1}\left(\frac{\omega}{1}\right) + tg^{-1}\left(\frac{\omega}{20}\right) - tg^{-1}\left(\frac{\omega}{4}\right) - tg^{-1}\left(\frac{\frac{6\omega}{100}}{1-\frac{\omega^2}{100}}\right)$$

61) Trazar diagrama de Bode de magn. y fase de:

$$F(p) = \frac{900p^2}{(p^2+2p+1)(p^2+20p+10.000)} = \frac{900p^2}{(p+1)^2(p^2+20p+10.000)}$$

$$F(p) = \frac{900p^2}{\left(\frac{p}{1}+1\right)^2 \cdot 10.000 \cdot \left(\frac{p^2}{10.000}+\frac{p}{500}+1\right)}$$

$$F(p) = \frac{0,09\,p^2}{\left(\frac{p}{1}+1\right)^2\left(\left(\frac{p}{100}\right)^2+\frac{p}{500}+1\right)}$$

$\omega_0 = 100$

$2\xi\omega_0 = 20$

$\xi = 0,1$

$$|F(j\omega)|_{dB} = \underbrace{20\log 0,09}_{-20,91dB} + 20\log\omega^2 - 40\log\sqrt{(\omega^2+1)} - 20\log\sqrt{\left(1-\left(\frac{\omega}{100}\right)^2\right)^2+\left(\frac{\omega}{500}\right)^2}$$

$$\underline{F(j\omega)} = 180° - tg^{-1}\left(\frac{2\omega}{1-\omega^2}\right) - tg^{-1}\left(\frac{\omega/500}{1-\left(\frac{\omega}{100}\right)^2}\right)$$

62) Trazar diag. de Bode de magn y fase de:

$$F(p) = \frac{(p+3)^3 (p+10)(p+2000)(p+50000)}{p^2 (p+100)^2 (p^2+200p+1000000)}$$

$$F(p) = \frac{27 \left(\frac{p}{3}+1\right)^3 10 \left(\frac{p}{10}+1\right) \cdot 2000 \left(\frac{p}{2000}+1\right) 50000 \left(\frac{p}{50000}+1\right)}{p^2 \, 100^2 \left(\frac{p}{100}+1\right)^2 \cdot 1000000 \left(\left(\frac{p}{1000}\right)^2 + \frac{p}{3000}+1\right)}$$

$$F(p) = \frac{2{,}7 \left(\frac{p}{3}+1\right)^3 \left(\frac{p}{10}+1\right)\left(\frac{p}{2000}+1\right)\left(\frac{p}{50.000}+1\right)}{p^2 \left(\frac{p}{100}+1\right)^2 \left(\left(\frac{p}{1000}\right)^2 + \frac{p}{5000}+1\right)}$$

$K_{te} = 2{,}7$; $K_{te\,dB} = 20 \log 2{,}7 = 8{,}63 dB$

Función de 2do grado:
- $W_0 = 1000$
- $2\zeta W_0 = 200 \rightarrow \zeta = 0{,}1$

63) Trazar diag de Bode de magn y fase de:

$$F(p) = \frac{10 p^2 (p+30)^2 (p+300)}{(p+1)^2 (p^2+20p+1000)(p+2700)}$$

$$F(p) = \frac{10 \cdot 30^2 \cdot 300 \cdot p^2 \left(\frac{p}{30}+1\right)^2 \left(\frac{p}{300}+1\right)}{\left(\frac{p}{1}+1\right)^2 \cdot 1000 \cdot \left(\frac{p^2}{1000}+\frac{p}{50}+1\right)\left(\frac{p}{2700}+1\right) 2700}$$

$$F(p) = \frac{p^2 \left(\frac{p}{30}+1\right)^2 \left(\frac{p}{300}+1\right)}{\left(\frac{p}{1}+1\right)^2 \left(\frac{p^2}{1000}+\frac{p}{50}+1\right)\left(\frac{p}{2700}+1\right)}$$

F. 2do grado:
$W_0 = 31{,}62$
$\zeta = 0{,}316$ → No es necesario corregir.

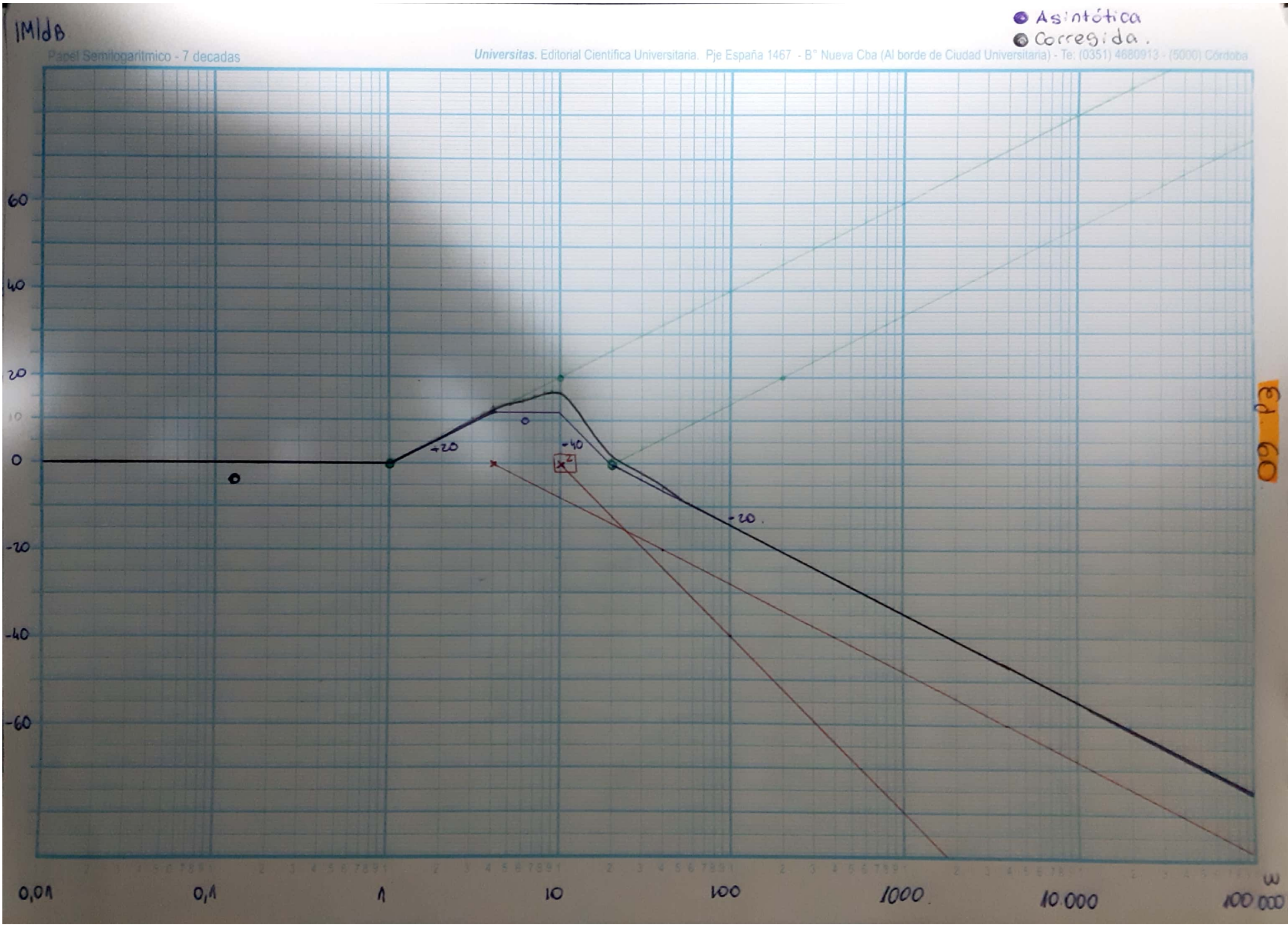
64) Trazar diag de Bode de magn y fase de:

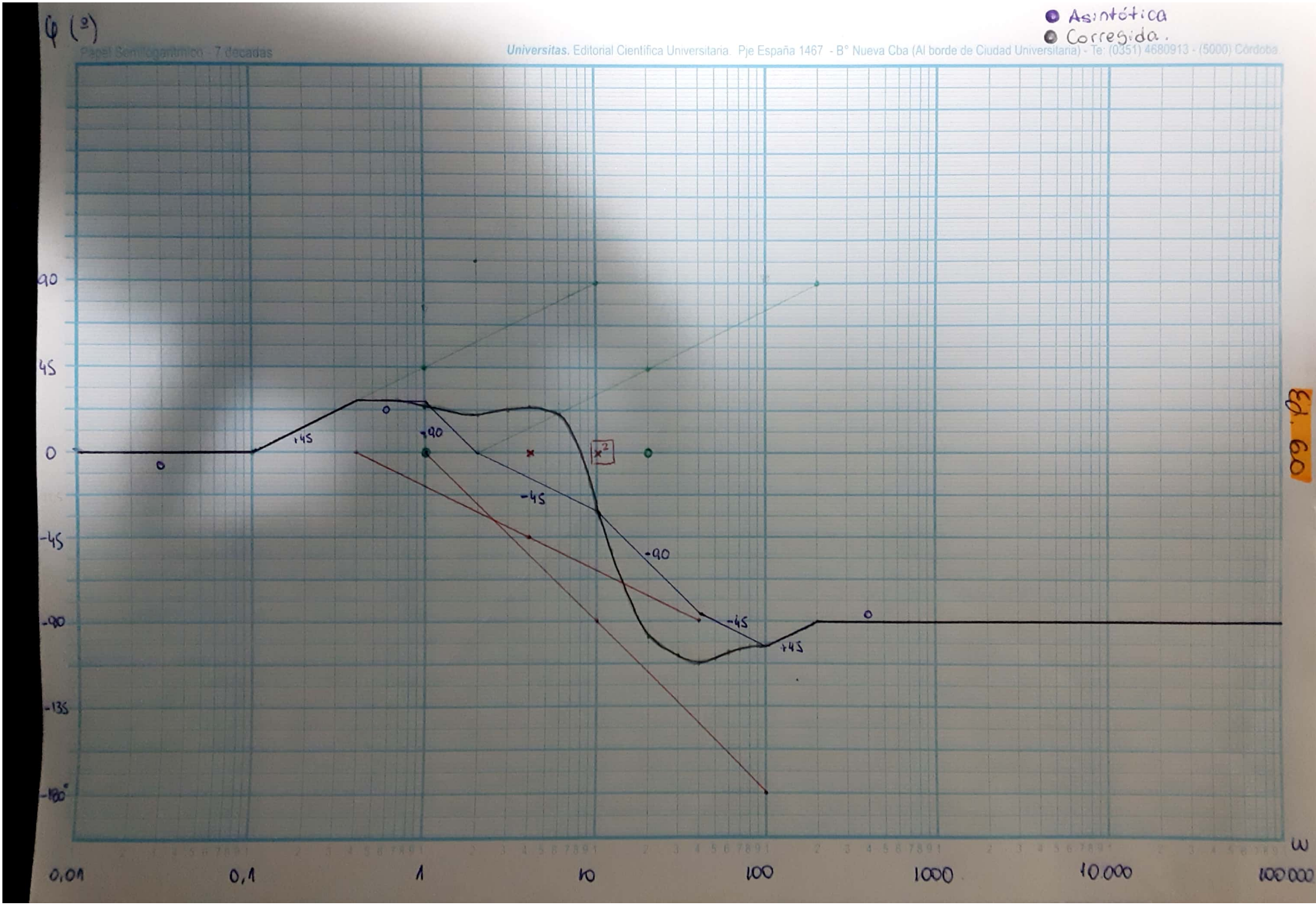
$$F(p) = \frac{p^2 (p+200)^2 (p+1000)^2}{(p+1)(p+10)^2 (p^2+32p+6400)(p+6700)}$$

$$F(p) = \frac{9{,}38 p^2 \left(\frac{p}{200}+1\right)^2 \left(\frac{p}{1000}+1\right)^2}{(p+1)\left(\frac{p}{10}+1\right)^2 \left(\frac{p^2}{6400}+\frac{p}{200}+1\right)\left(\frac{p}{6700}+1\right)}$$

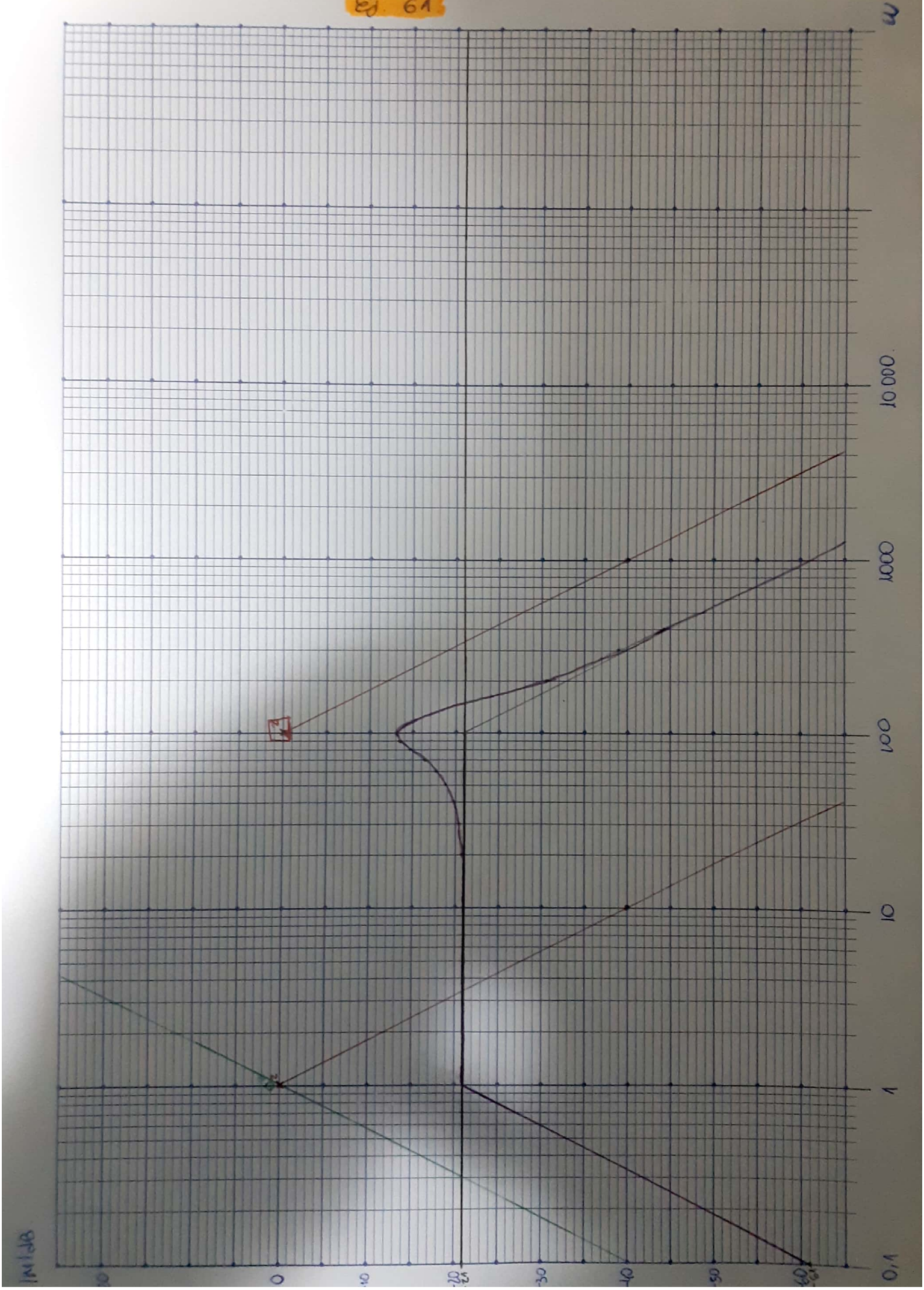
F. 2do grado:
$W_0 = 80$
$\zeta = 0{,}2$

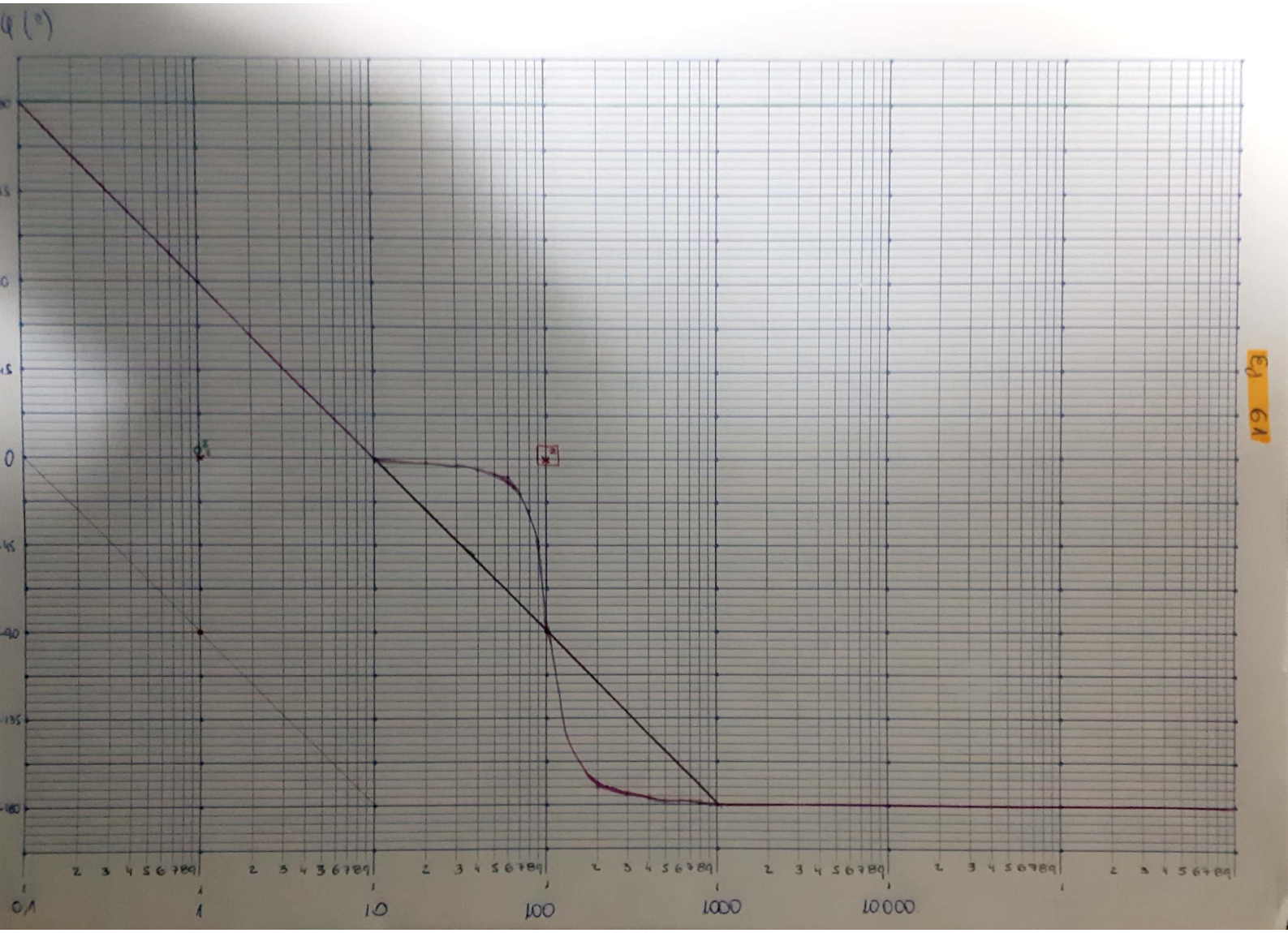
$K_{dB} = 20 \log 9{,}38 = 19{,}44 dB$.

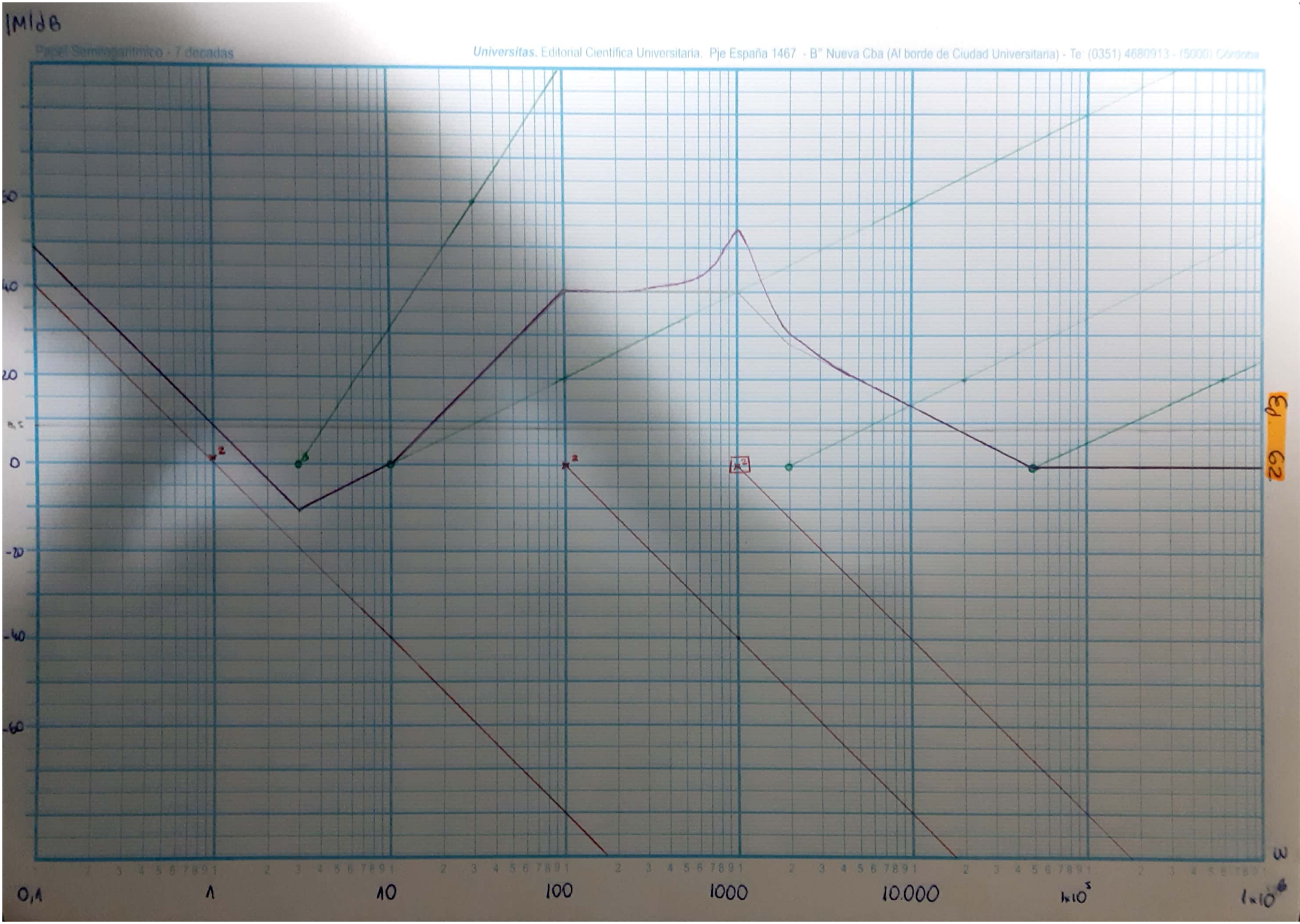


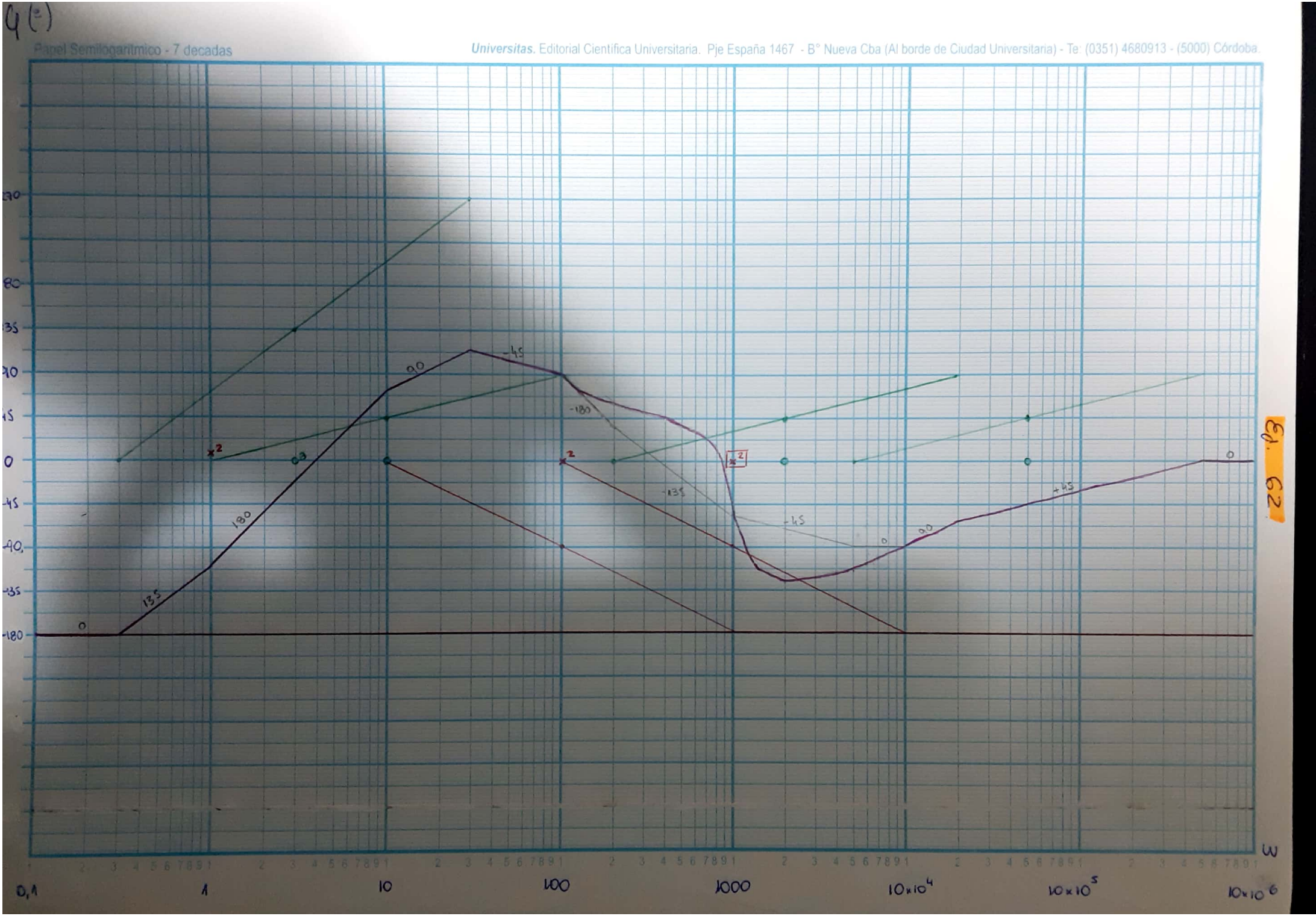


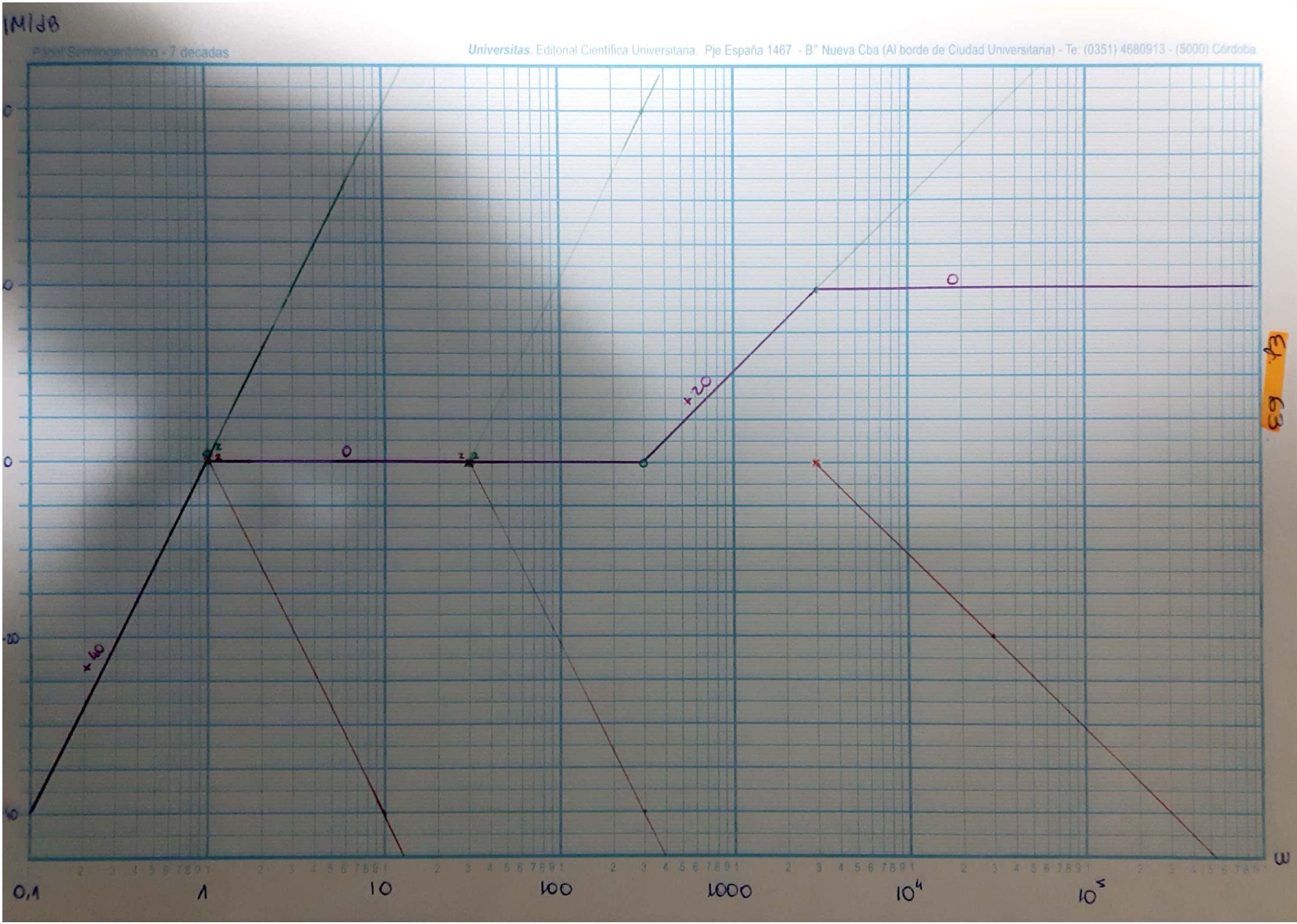
Ej. 61

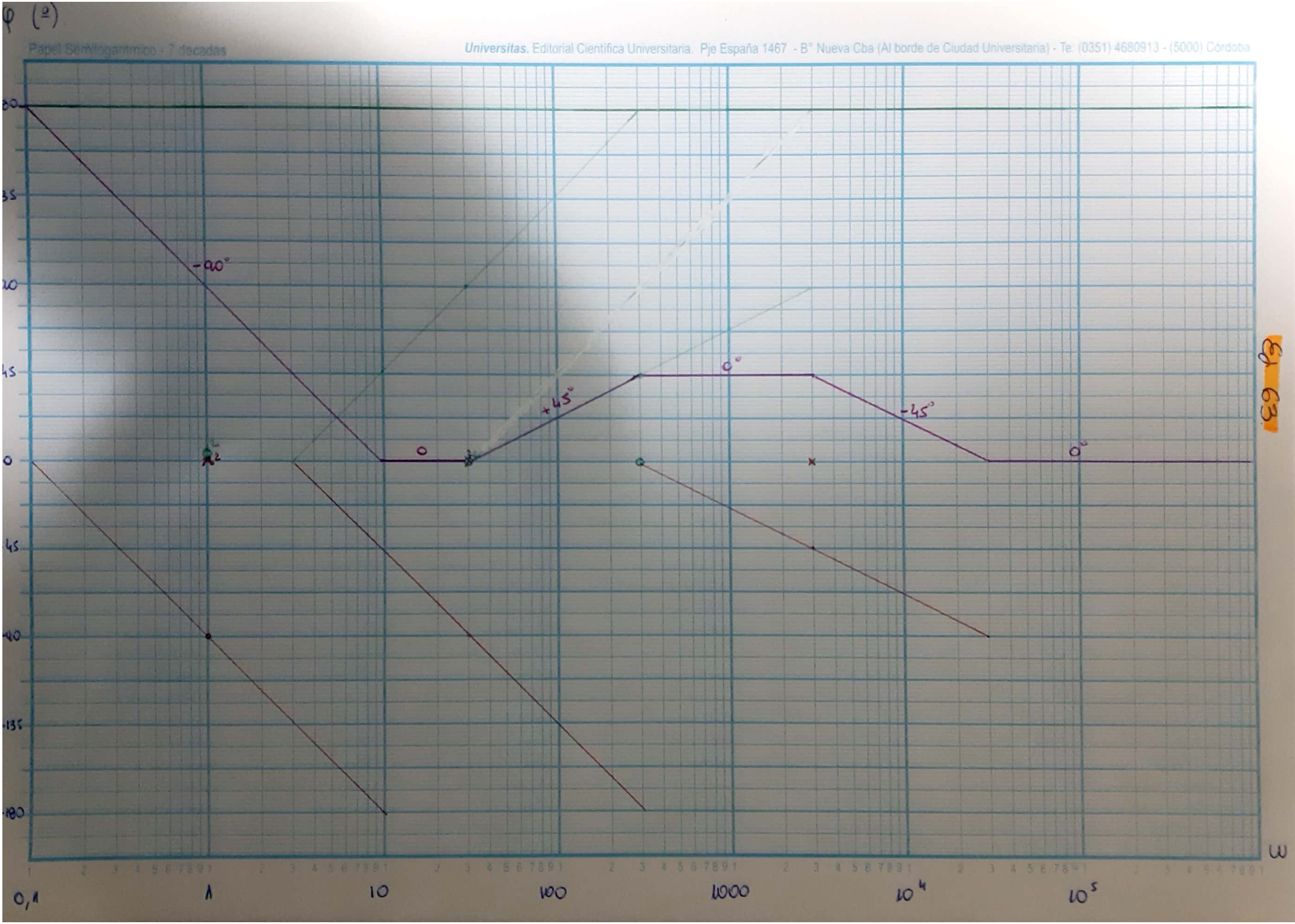


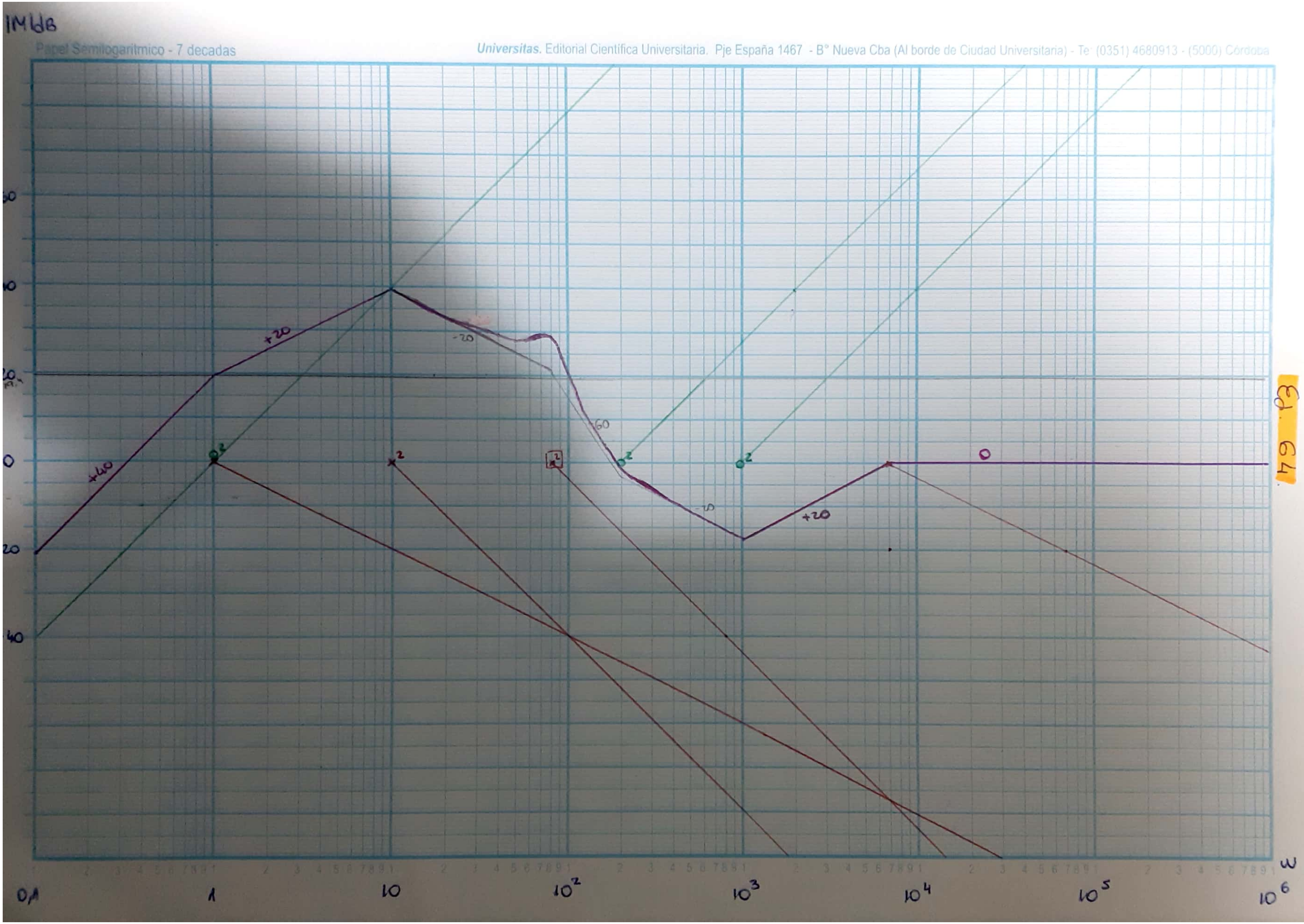












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