Funzione di trasferimento

$G_p = 1/(s/3+1)^2(s+1)$

$N := 500$

$k := 0 .. N$

$Min := -2$ $\qquad$ $Max := 2$

$$espo(k) := Min + \frac{k\cdot(Max - Min)}{N} \qquad \omega_k := 10^{espo(k)}$$

$$G(s) := \left(\frac{1}{\frac{s}{3}+1}\right)\cdot\left(\frac{1}{\frac{s}{3}+1}\right)\cdot\left(\frac{1}{s+1}\right)$$

$$G1(s) := \left(\frac{1}{\frac{s}{3}+1}\right) \qquad G2(s) := \left(\frac{1}{\frac{s}{3}+1}\right) \qquad G3(s) := \left(\frac{1}{s+1}\right)$$

Calcolo e costruzione del diagramma di AR vs. ω con il Metodo Approssimato degli Asintoti

Calcolo frequenze d'angolo

$$\omega_{c1} := \frac{1}{\left(\frac{1}{3}\right)} \quad \Rightarrow \quad \omega_{c1} = 3$$

$$\omega_{c2} := \frac{1}{\left(\frac{1}{3}\right)} \quad \Rightarrow \quad \omega_{c2} = 3$$

$$\omega_{c3} := \frac{1}{1} \quad \Rightarrow \quad \omega_{c3} = 1$$

Tabella delle pendenze del log(AR)

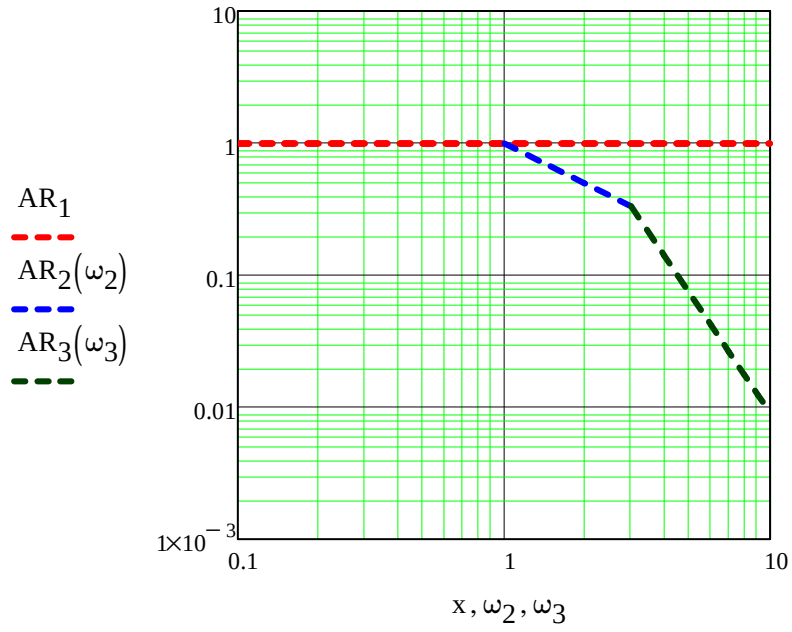
NB: in questo caso $\omega_{c1} = \omega_{c2}$

Intervallo di frequenze	G_1	G_2	G_3	Globale
$0 \le \omega < \omega_{c3}$	0	0	0	0
$\omega_{c3} \le \omega < \omega_{c1}$	0	0	-1	-1
$\omega_{c1} \le \omega < \infty$	-1	-1	-1	-3

$$\omega_1 := 0.1 .. \omega_{c3} \qquad \omega_2 := \omega_{c3} .. \omega_{c1} \qquad \omega_3 := \omega_{c1} .. 10$$

$$AR_1 := 1 \qquad AR_2(\omega_2) := \frac{1}{\omega_2} \qquad AR_3(\omega_3) := AR_2(\omega_{c1}) + AR_2(\omega_{c1}) \cdot \frac{\left[\left(\frac{1}{\omega_3^{\,3}}\right) - \left(\frac{1}{\omega_{c1}^{\,3}}\right)\right]}{\left(\frac{1}{\omega_{c1}^{\,3}}\right)}$$

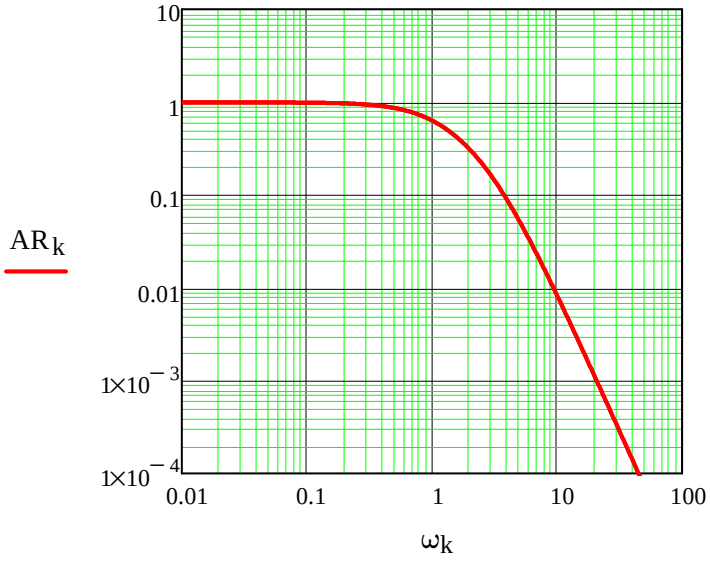
Eq. della retta passante per il punto $[\omega_{c1}, AR_2(\omega_{c1})]$ e tendente a 0 per $\omega \to \infty$



Calcolo e costruzione del diagramma di AR vs. ω come "curva effettiva"

$AR1_k := \left|G1\left(i\cdot\omega_k\right)\right|$ $AR2_k := \left|G2\left(i\cdot\omega_k\right)\right|$ $AR3_k := \left|G3\left(i\cdot\omega_k\right)\right|$

$AR_k := AR1_k\cdot AR2_k\cdot AR3_k$

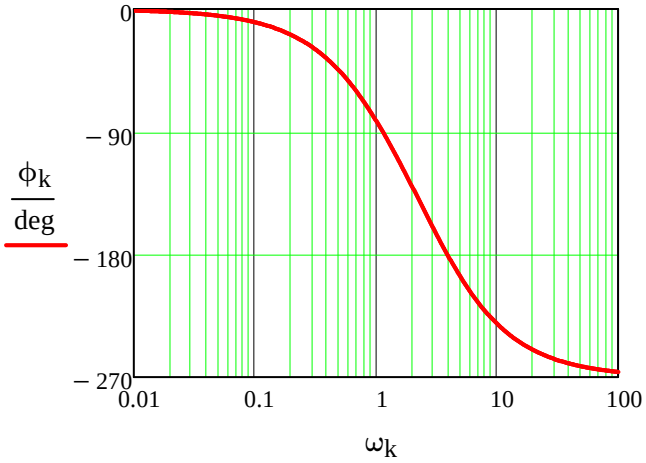


<-- pendenza = -3
in scala LOG-LOG

Calcolo e costruzione del diagramma continuo di ϕ vs. ω

$\phi 1_k := \arg\left(G1\left(i\cdot\omega_k\right)\right)$ $\phi 2_k := \arg\left(G2\left(i\cdot\omega_k\right)\right)$ $\phi 3_k := \arg\left(G3\left(i\cdot\omega_k\right)\right)$

$\phi_k := \phi 1_k + \phi 2_k + \phi 3_k$



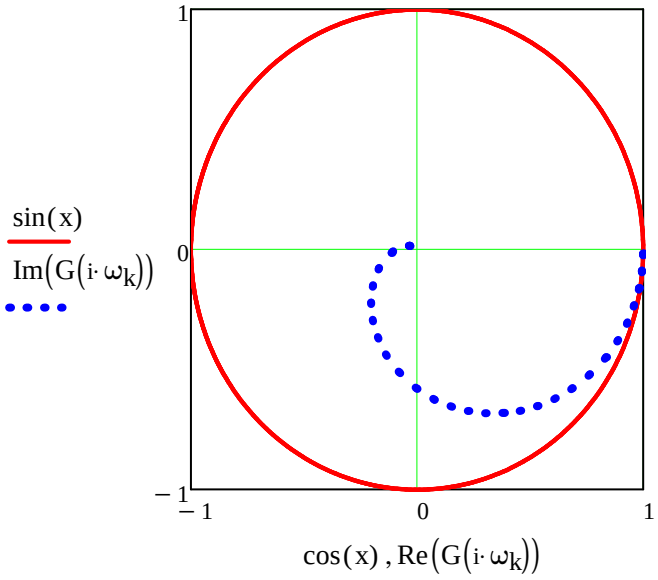
Calcolo e costruzione del Diagramma di Nyquist

$N := 500$

$k := 0 .. N$

$Min := -2$ $Max := 2$

$espo(k) := Min + \frac{k\cdot(Max - Min)}{N}$ $\omega_k := 10^{espo(k)}$



cerchio unitario