

$$AMP(r, \xi) := \frac{r^2}{\sqrt{(1-r^2)^2 + (2 \cdot \xi \cdot r)^2}}$$

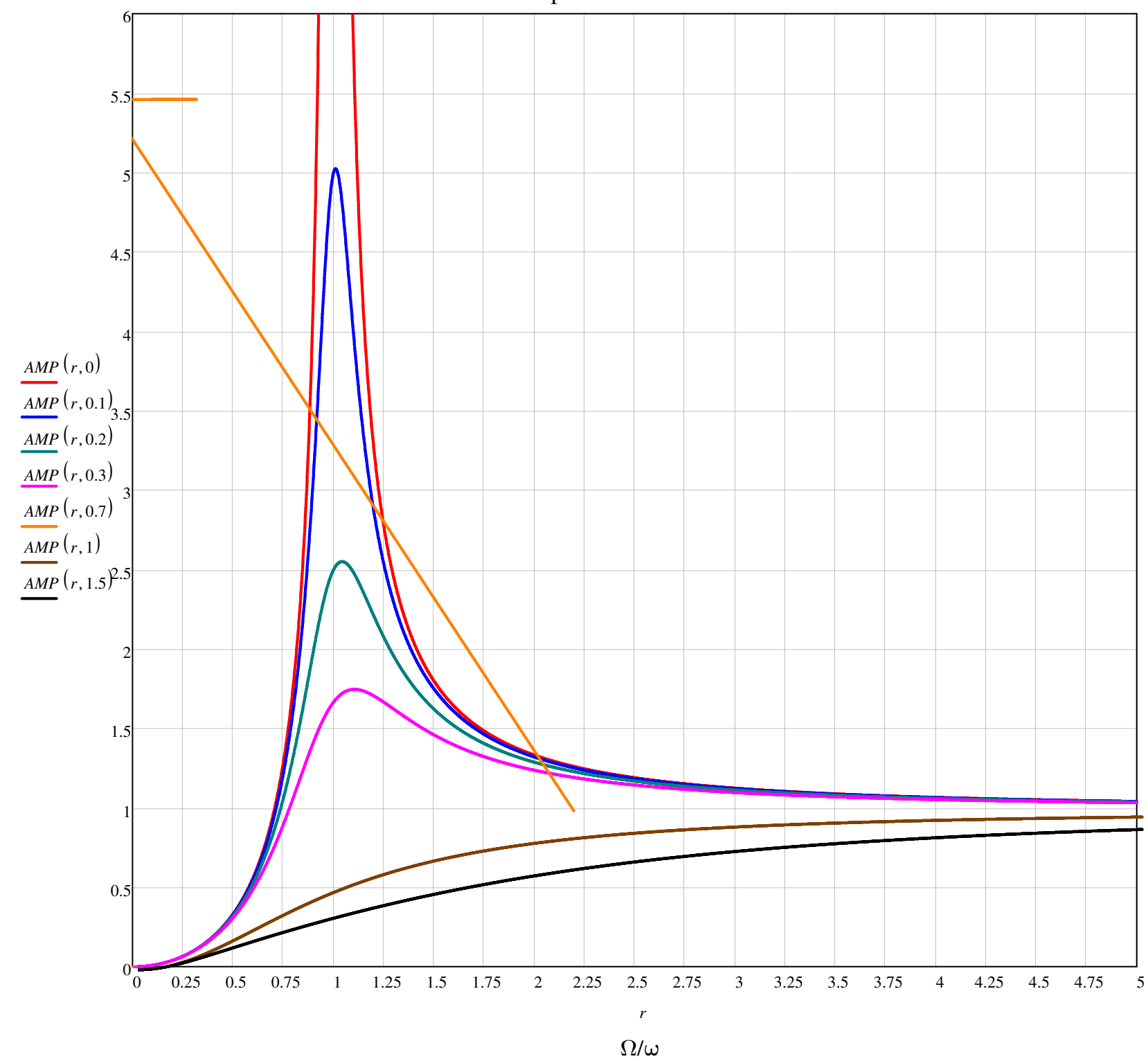
Ampiezza adimensionale

$$\varphi(r, \xi) := \frac{\text{atan2}(1-r^2, 2 \cdot \xi \cdot r)}{\text{deg}}$$

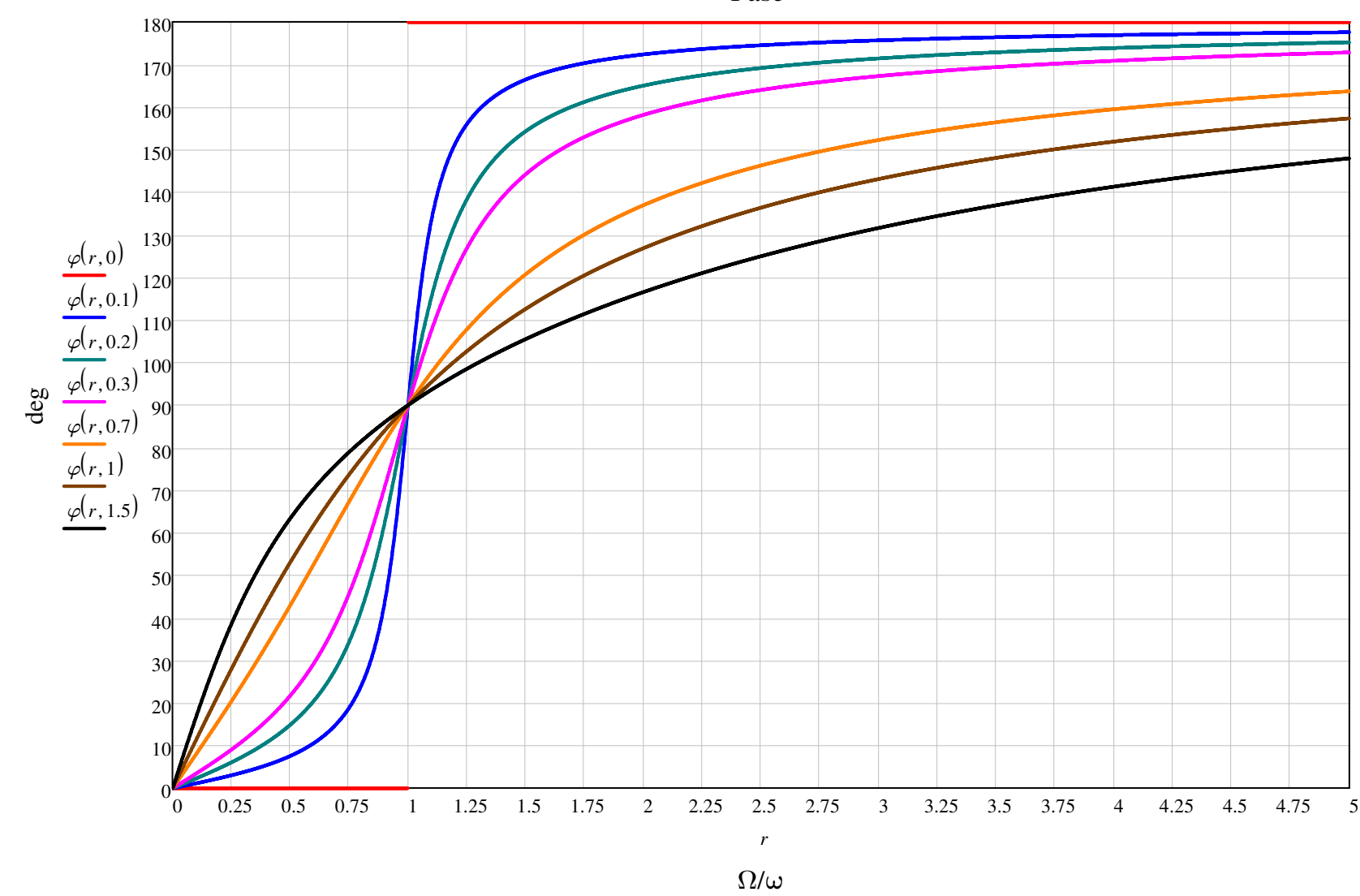
Fase

$r := 0, 0.001..5$

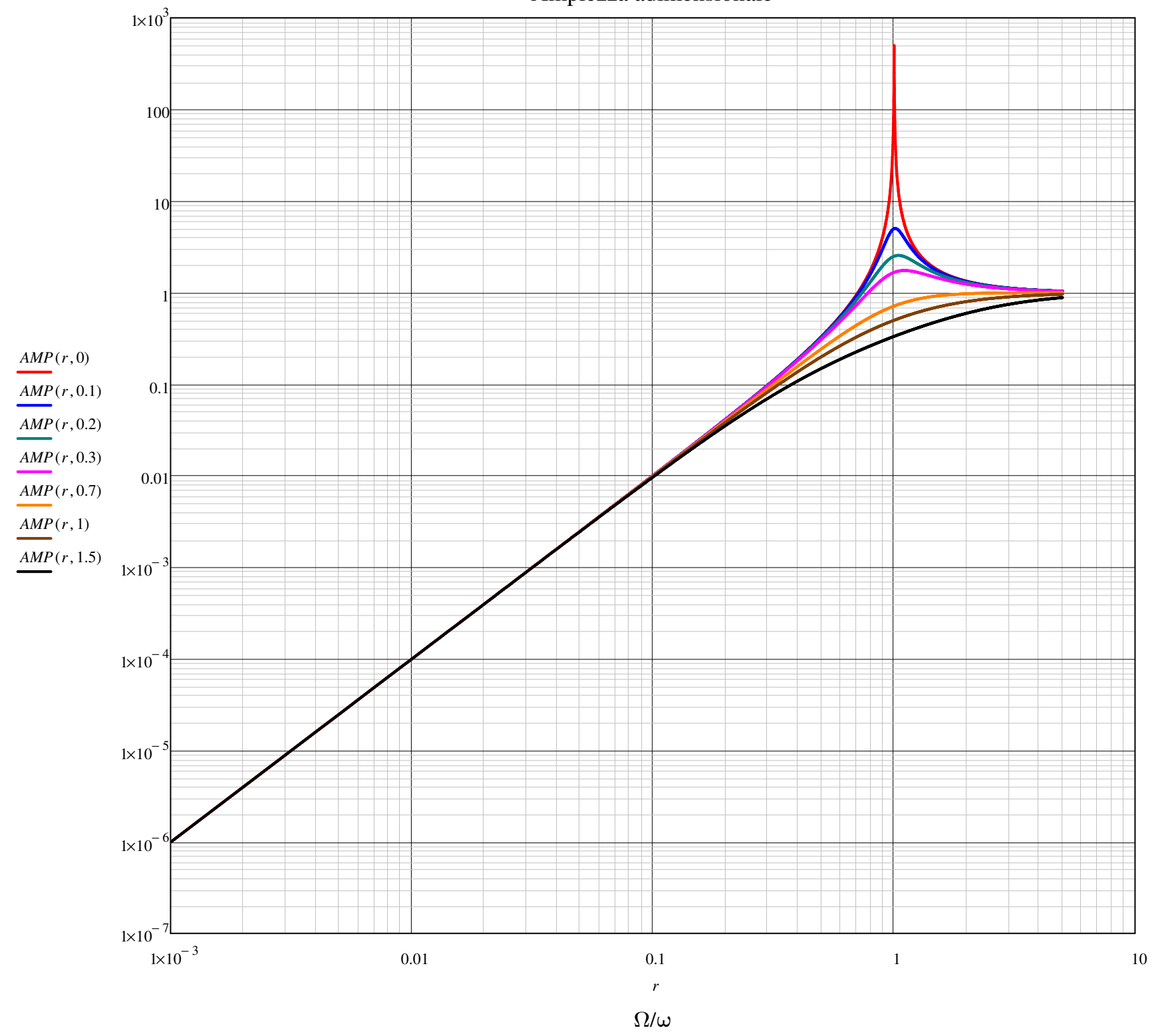
Ampiezza adimensionale



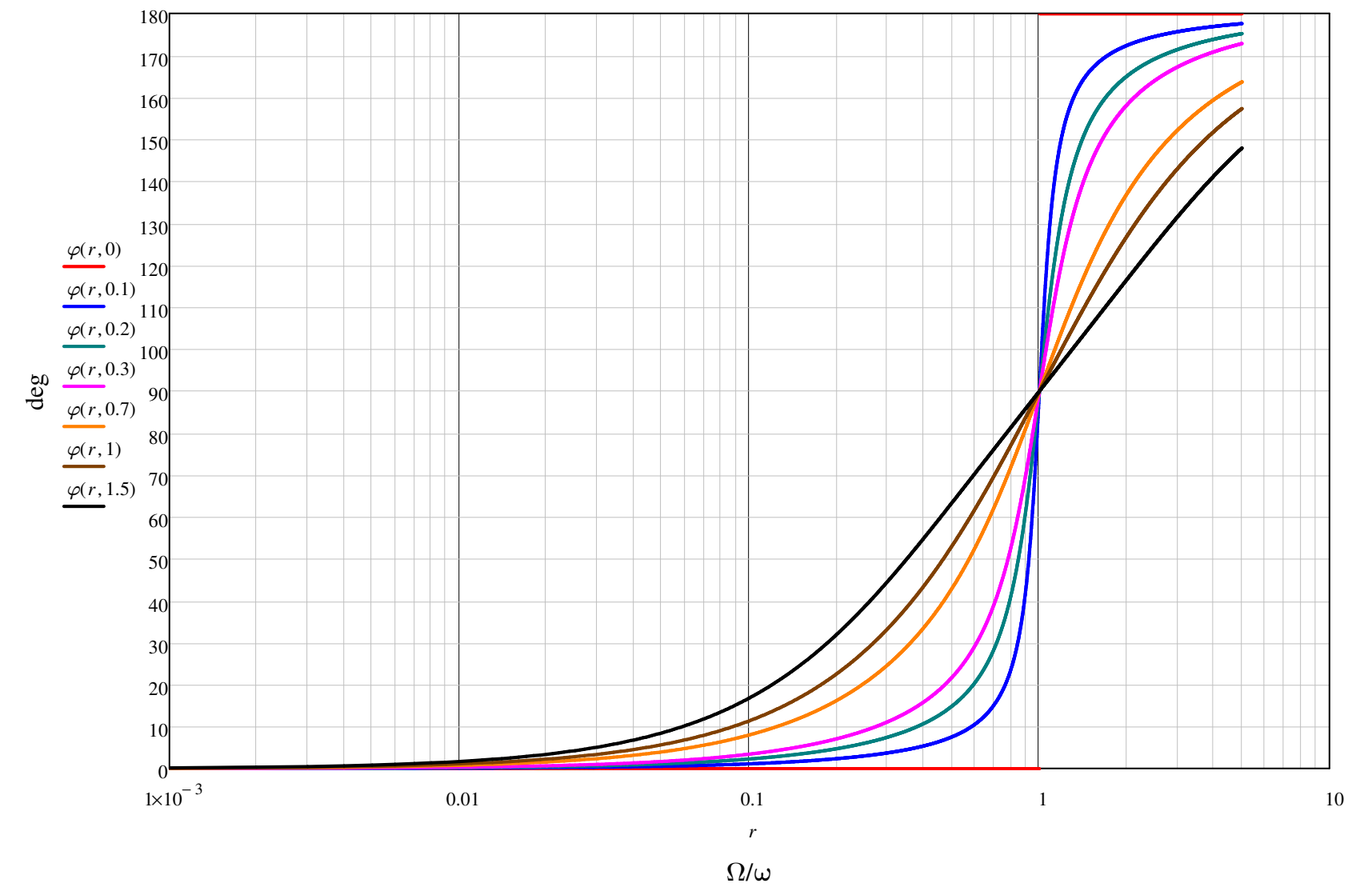
Fase



Ampiezza adimensionale



Fase



Dati del sistema vibrante

- $M := 20$ Massa della "cassa"
- $m_w := 0.5$ Massa squilibrata
- $M_T := M + m = 20.5$ Massa totale
- $R_w := 15 \cdot 10^{-3} = 0.015$ Raggio dell'orbita (eccentricità)
- $k := 1000$ Rigidezza
- $c_{\omega} := 30$ Cost. di smorzamento

$$\omega := \sqrt{\frac{k}{M_T}} = 6.984$$

$$\xi := \frac{c}{2 \cdot M_T \cdot \omega} = 0.105$$

Dati della forzante

$n := 50$ Velocità angolare del rotore in RPM (giri/min)

$$\Omega := \frac{2 \cdot \pi \cdot n}{60} = 5.236$$

$$T_f := \frac{2 \cdot \pi}{\Omega} = 1.2$$

$$r := \frac{\Omega}{\omega} = 0.75$$

$$X_0 := \left(\frac{m}{M_T} \right) \cdot R = 3.659 \times 10^{-4}$$

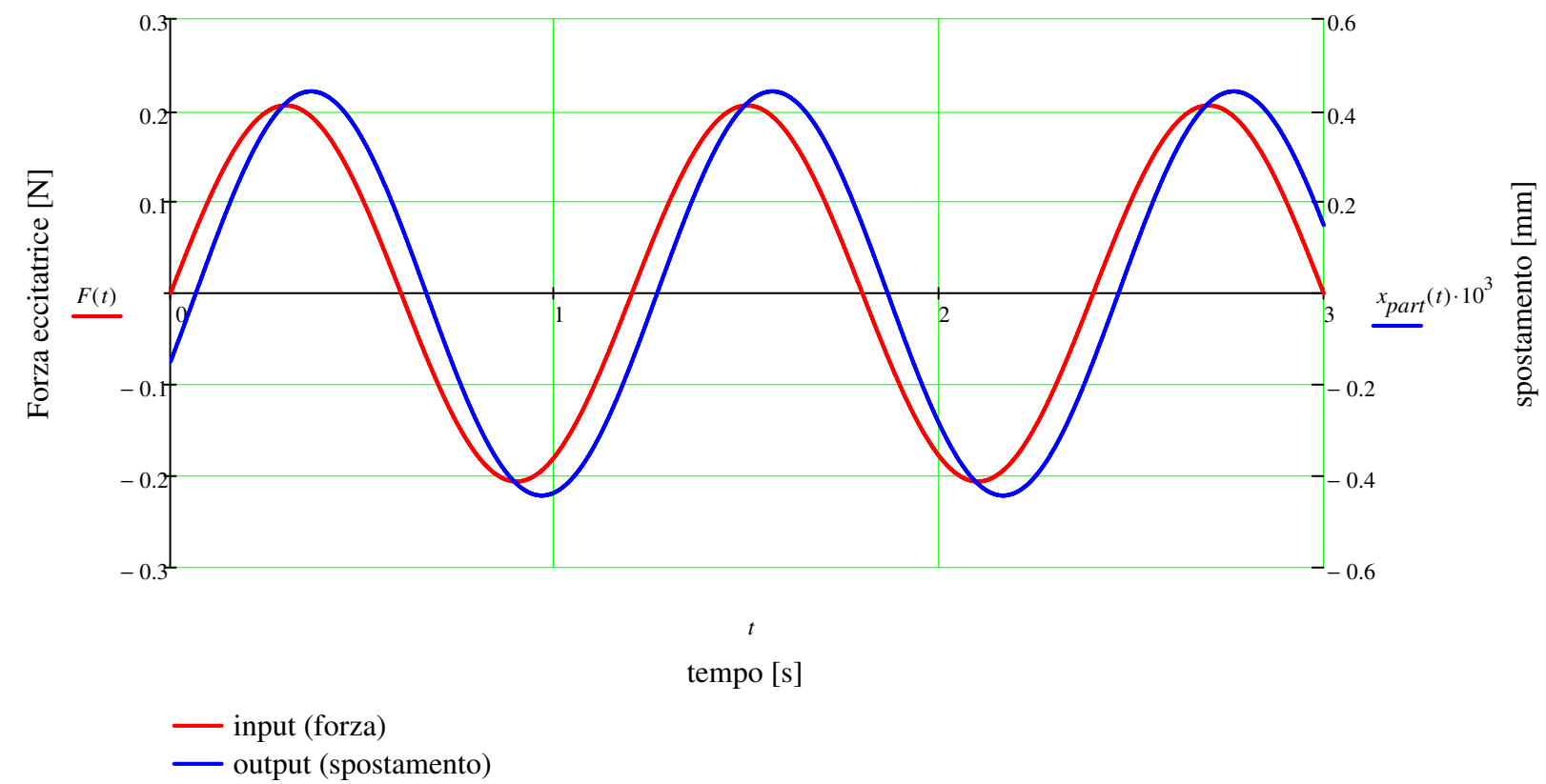
$$X := \frac{X_0 \cdot r^2}{\sqrt{(1-r^2)^2 + (2 \cdot \xi \cdot r)^2}} = 4.419 \times 10^{-4}$$

$$\varphi := \text{angle}(1-r^2, 2 \cdot \xi \cdot r) = 0.344 \text{ rad} \quad \varphi = 19.73 \text{ deg}$$

$$F(t) := m \cdot \Omega^2 \cdot R \cdot \sin(\Omega \cdot t) \quad F(t) = 0.20561675835602831 \cdot \sin(5.2359877559829888 \cdot t) \quad \text{Componente della forza centrifuga agente nella direz. del moto}$$

$$x_{part}(t) := X \cdot \sin(\Omega \cdot t - \varphi) \quad x_{part}(t) = 0.00044190438267680839 \cdot \sin(5.2359877559829888 \cdot t - 0.34435549690751766)$$

$$t := 0, 0.001 .. 2.5 \cdot T_f$$



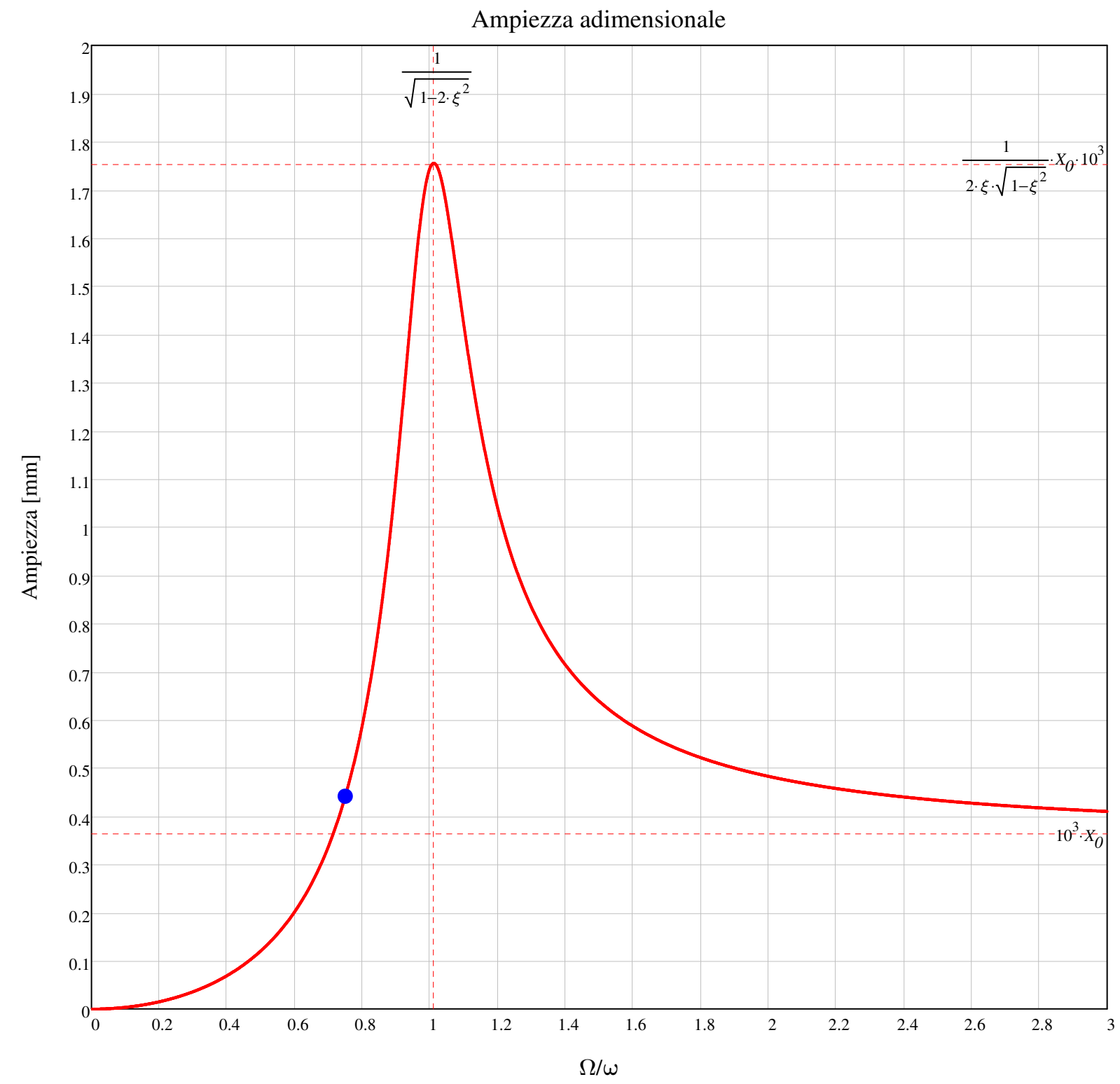
$r = 0.75$ $\xi = 0.105$

$$AMP(r, \xi) := \frac{r^2}{\sqrt{(1-r^2)^2 + (2 \cdot \xi \cdot r)^2}}$$

Ampiezza adim.

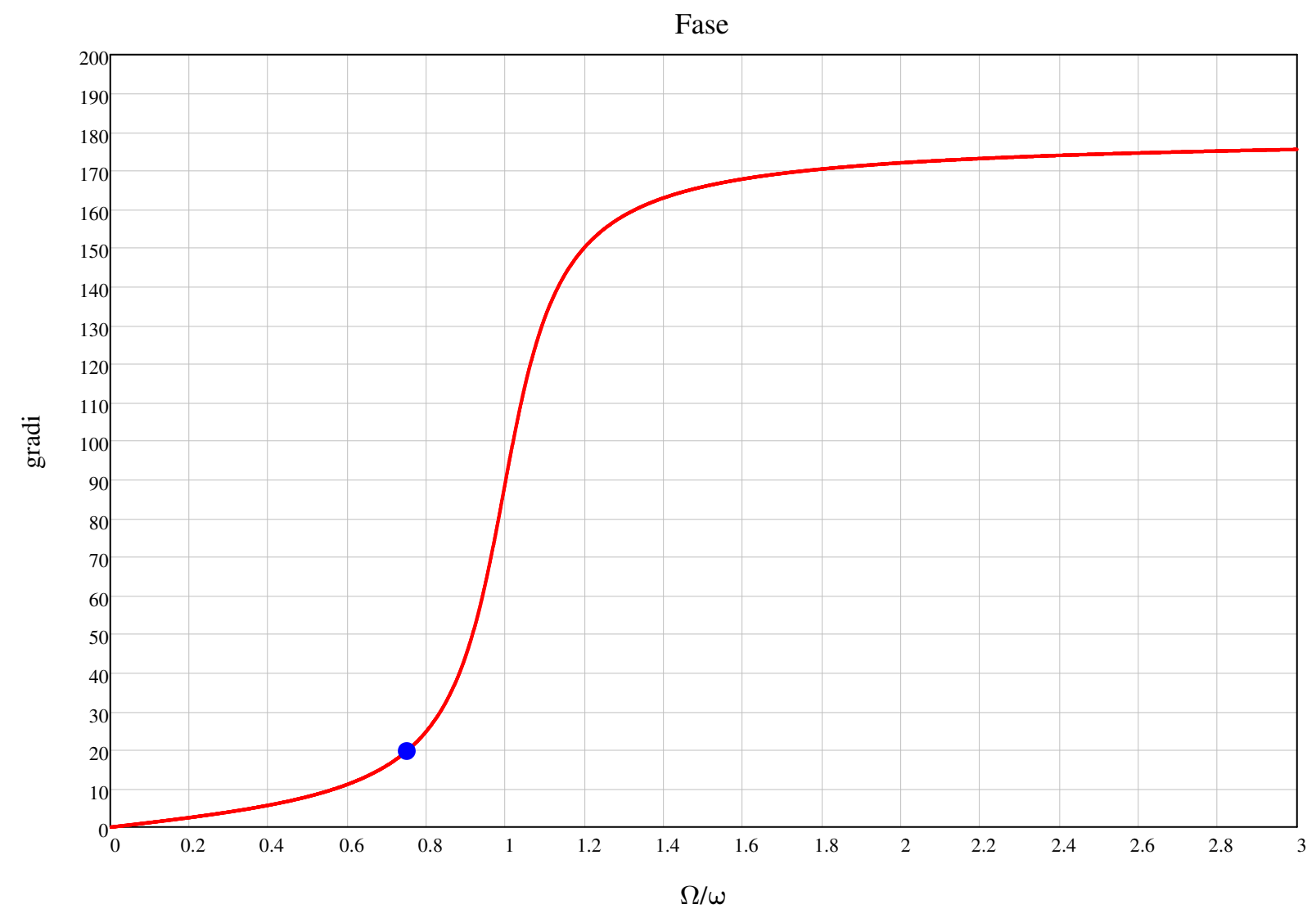
$$FASE(r, \xi) := \frac{\text{angle}(1-r^2, 2 \cdot \xi \cdot r)}{\text{deg}}$$

$r_x := 0,0001..3$



$r = 0.75$ $X \cdot 1000 = 0.442$

$\xi = 0.105$ $\varphi = 19.73 \text{ deg}$



ascissa del massimo

$$r_{max} := \frac{1}{\sqrt{1 - 2 \cdot \xi^2}} = 1.011$$

ordinata del massimo

$$z := \frac{1}{2 \cdot \xi \cdot \sqrt{1 - \xi^2}} = 4.799$$