

$$l:=1.5$$

$$d:=10\cdot 10^{-3}=0.01$$

$$A_{sez}:=\frac{\pi\cdot d^2}{4}=7.854\times 10^{-5}$$

$$E:=206000\cdot 10^6=2.06\times 10^{11}$$

$$\rho:=7800$$

$$c:=\sqrt{\frac{E}{\rho}}=5139.091$$

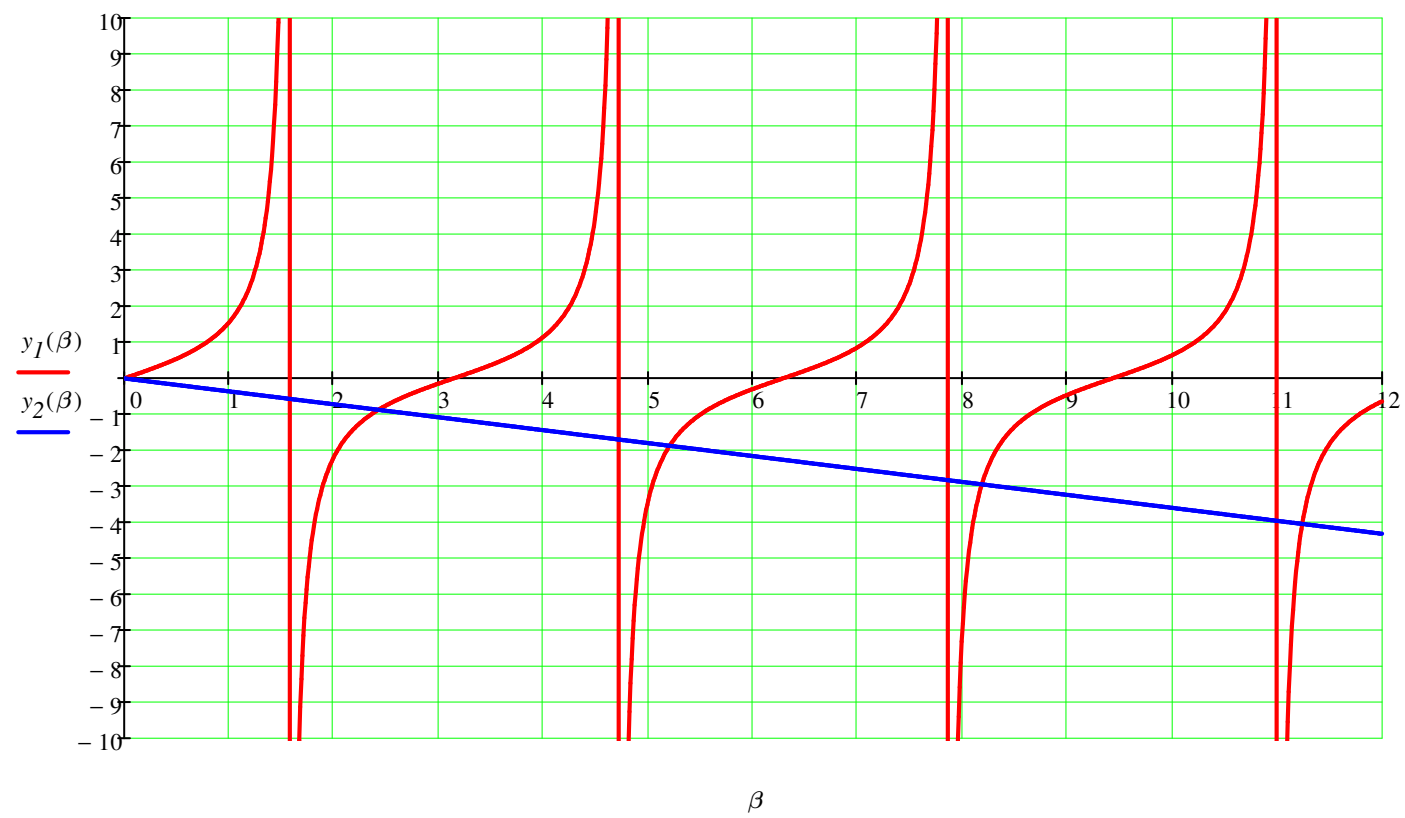
$$k_{assiale}:=\frac{E\cdot A_{sez}}{l}=1.079\times 10^7$$

Rigidezza assiale della barra

$$k:=3\cdot 10^7$$

$$y_1(\beta):=tan(\beta) \qquad b:=\frac{E\cdot A_{sez}}{k\cdot l}=0.36 \qquad y_2(\beta):=-b\cdot \beta$$

$$\beta:=0,0.01..12 \qquad FS:=10$$



$$F(\beta) := \tan(\beta) + b \cdot \beta$$

$$\beta := 2$$

$$\beta_1 := \text{root}(F(\beta), \beta) = 2.425$$

$$\beta := 5$$

$$\beta_2 := \text{root}(F(\beta), \beta) = 5.203$$

$$\beta := 8$$

$$\beta_3 := \text{root}(F(\beta), \beta) = 8.182$$

$$\beta := 11$$

$$\beta_4 := \text{root}(F(\beta), \beta) = 11.238$$

	rad/s	Hz
$\beta_1 = 2.425$	$\omega_1 := \frac{c}{l} \cdot \beta_1 = 8306.868$	$f_1 := \frac{\omega_1}{2 \cdot \pi} = 1322.079$
$\beta_2 = 5.203$	$\omega_2 := \frac{c}{l} \cdot \beta_2 = 17826.764$	$f_2 := \frac{\omega_2}{2 \cdot \pi} = 2837.218$
$\beta_3 = 8.182$	$\omega_3 := \frac{c}{l} \cdot \beta_3 = 28030.912$	$f_3 := \frac{\omega_3}{2 \cdot \pi} = 4461.258$
$\beta_4 = 11.238$	$\omega_4 := \frac{c}{l} \cdot \beta_4 = 38502.721$	$f_4 := \frac{\omega_4}{2 \cdot \pi} = 6127.898$