$Y_B := 40\ mm$ $\qquad J := 10\ kg \cdot m^2$

$s_B := 40\ mm$ $\qquad p := 6\ mm$ $\qquad \eta := 0.9$

$Y_A := 255\ mm$ $\qquad I_{bl} := 11\ A$ $\qquad M_{bl} := 2450\ N \cdot mm$

$s_A := 45\ mm$ $\qquad I_{leer} := 0.27\ A$ $\qquad n_{leer} := 352.57\ min^{-1}$

$\mathbf{clear}_{\mathbf{sym}}\left(Y_B, J, Y_A, s_B, s_A, I_{bl}, M_{bl}, I_{leer}, n_{leer}, p, \eta\right)$

$$K := \sqrt{\left(Y_B \cdot \cos(0) - s_B \cdot \sin(0) + Y_A\right)^2 + \left(Y_B \cdot \sin(0) + s_B \cdot \cos(0) - s_A\right)^2} \qquad K = 295.042\ mm$$

clea

$$x(t) := K - \sqrt{\left(Y_B \cdot \cos(\varphi(t)) - s_B \cdot \sin(\varphi(t)) - Y_A\right)^2 + \left(Y_B \cdot \sin(\varphi(t)) + s_B \cdot \cos(\varphi(t)) - s_A\right)^2}$$

$$n(t) := x'(t) = p \cdot n(t) \xrightarrow{solve, n(t)} -\frac{2 \cdot \left(Y_B \cdot \frac{d}{dt}\varphi(t) \cdot \cos(\varphi(t)) - s_B \cdot \frac{d}{dt}\varphi(t) \cdot \sin(\varphi(t))\right) \cdot \left(s_B \cdot \cos(\varphi(t))\right) \ldots}{2 \cdot p \cdot \sqrt{\left(s_B \cdot \cos(\varphi(t\right.}}$$

$$h(t) := \frac{\left(Y_B \cdot \cos(\varphi(t)) - s_B \cdot \sin(\varphi(t)) + Y_A\right) \cdot s_A - \left(Y_B \cdot \sin(\varphi(t)) + s_B \cdot \cos(\varphi(t)) - s_A\right) \cdot \left(-Y_A\right)}{\sqrt{\left(Y_B \cdot \cos(\varphi(t)) - s_B \cdot \sin(\varphi(t)) + Y_A\right)^2 + \left(Y_B \cdot \sin(\varphi(t)) + s_B \cdot \cos(\varphi(t)) - s_A\right)^2}}$$

$$M(t) := -\frac{M_{bl}}{n_{leer}} \cdot n(t) + M_{bl}$$

$$F_A(t) := \frac{2 \cdot \pi \cdot \eta}{p} \cdot M(t)$$

$$h(t, \varphi 0) := h(t) \xrightarrow{substitute, \varphi(t) = \varphi 0} \frac{s_A \cdot Y_B \cdot \cos(\varphi 0) + s_B \cdot Y_A \cdot \cos(\varphi 0) - s_A \cdot s_B \cdot \sin(\varphi 0) + Y_A \cdot Y_B \cdot \sin(\varphi 0}{\sqrt{\left(Y_A + Y_B \cdot \cos(\varphi 0) - s_B \cdot \sin(\varphi 0)\right)^2 + \left(s_B \cdot \cos(\varphi 0) - s_A + Y_B \cdot \sin(\varphi 0\right.}}$$

$$F_A(t, \varphi 0, \varphi 1) := F_A(t) \xrightarrow[substitute, \frac{d}{dt}\varphi(t) = \varphi 1]{substitute, \varphi(t) = \varphi 0} \ldots$$

$t_{end} := 1.2\ s$

ungslöser Nebenbedingungen Schätzwerte

$$J \cdot \varphi''(t) = F_A(t, \varphi(t), \varphi'(t)) \cdot h(t, \varphi(t))$$

$\varphi(0\ s) = 0\ °$

$\varphi'(0\ s) = 0\ \frac{°}{s}$

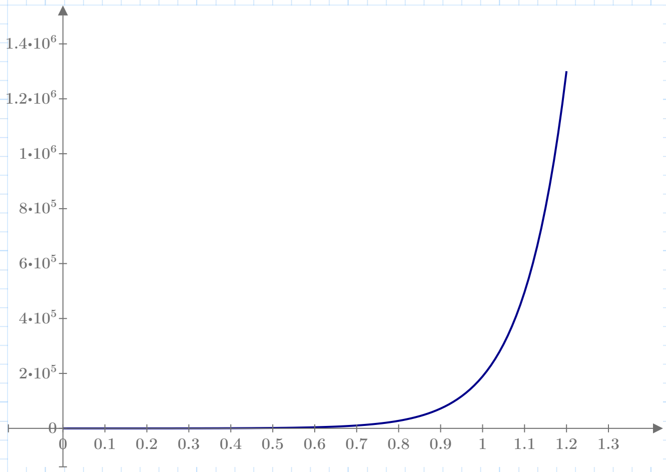
$\varphi := \mathrm{odesolve}\left(\varphi(t), t_{end}\right)$

Gleic

$t := 0\ s, 0.01\ s .. t_{end}$

$\varphi(t_{end}) = 2.27 \cdot 10^{4}$

$\varphi(t_{end}) = (1.301 \cdot 10^{6})\ deg$



$\varphi(t)\ (°)$

$t\ (s)$