

$m := 1$
 $l := 1$

$v_0 := 2 \cdot \sqrt{g \cdot l}$

$\varphi_0 := \frac{\pi}{2}$

$a := l$

$g := 9.80665$
 $k := 0.5$

$v_0 := 0$

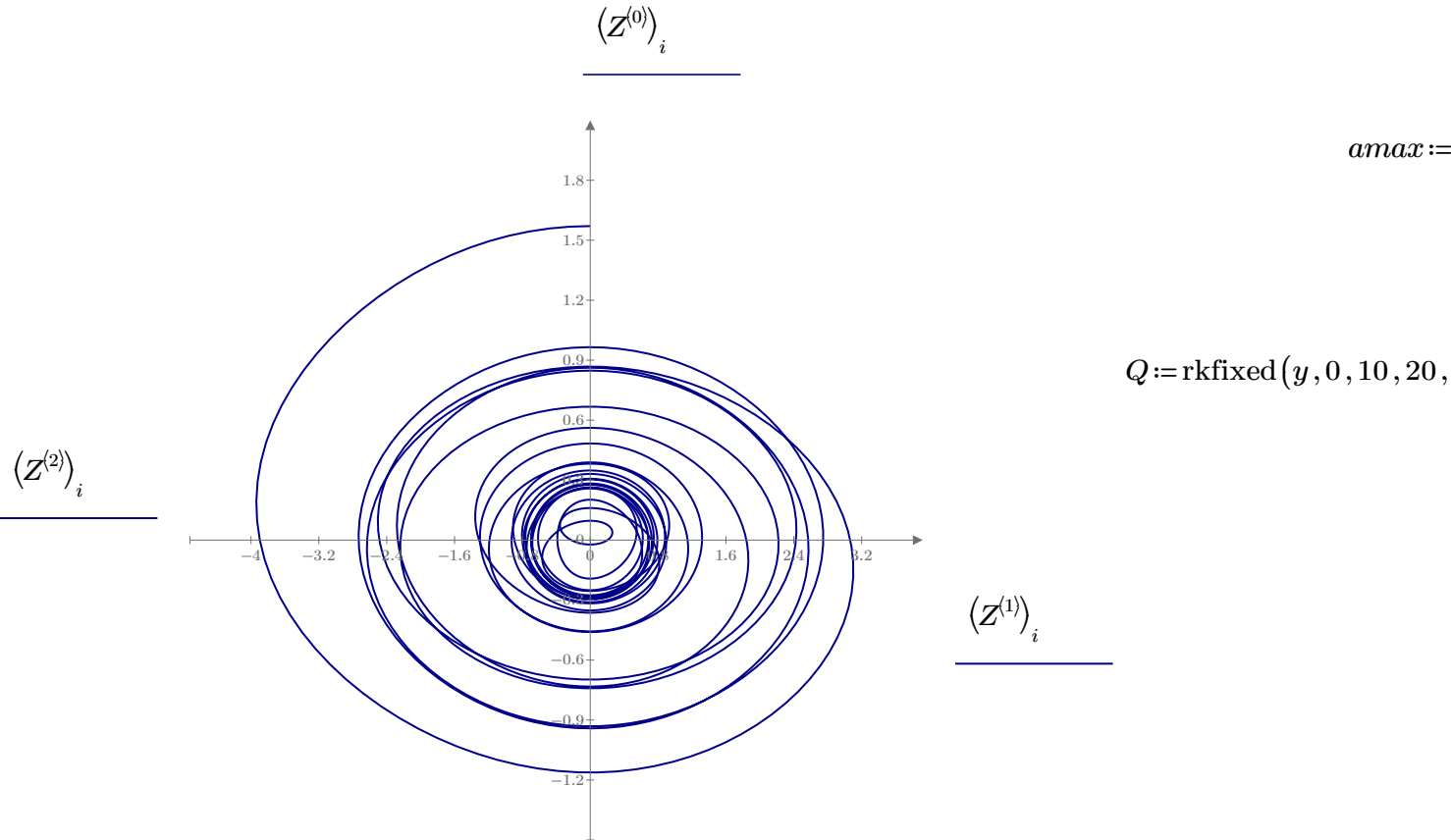
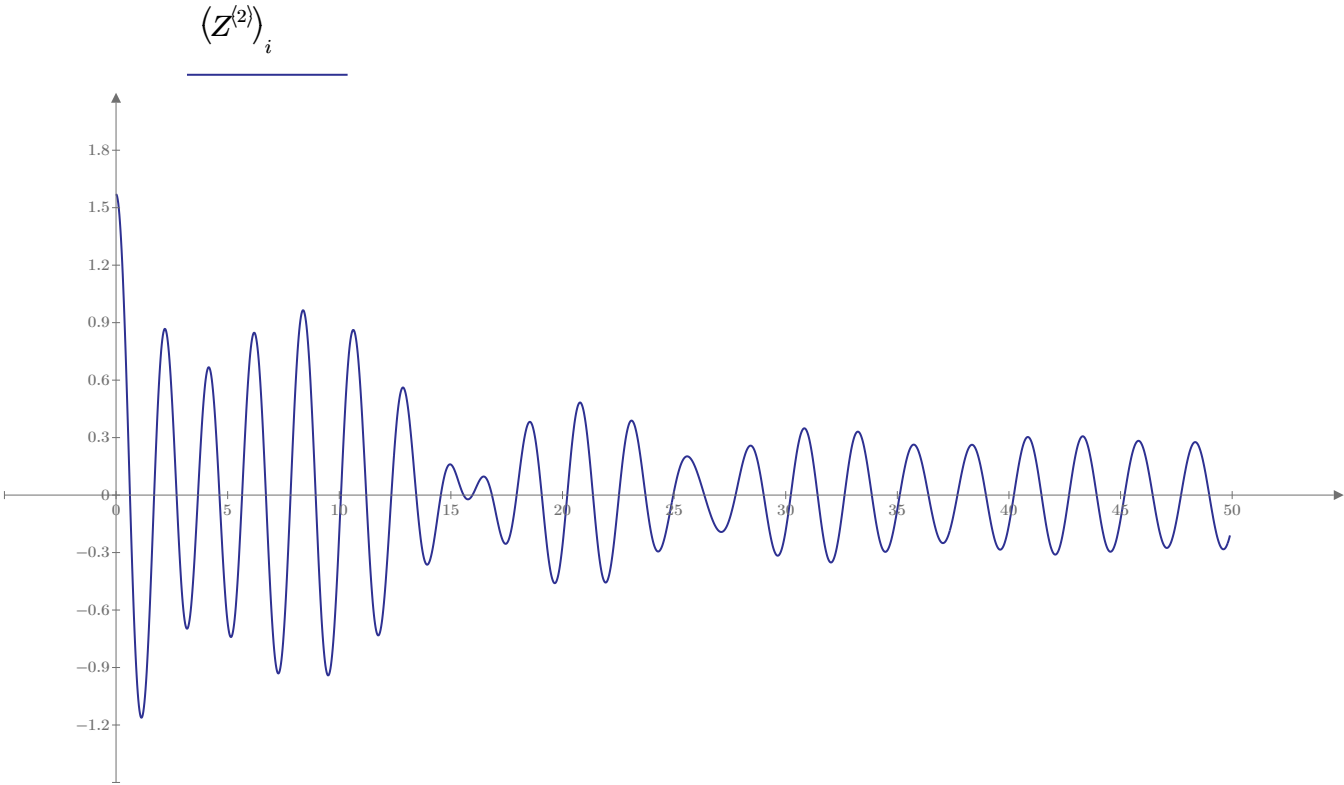
$y := \begin{bmatrix} v_0 \\ \varphi_0 \end{bmatrix}$

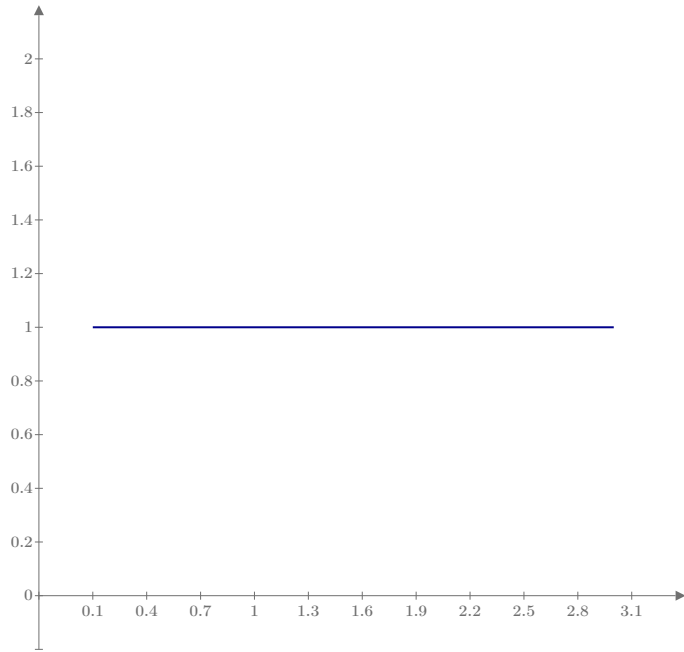
$w_0 := \sqrt{\frac{g}{l}}$

$$D(t,y) := \begin{bmatrix} -w_0^2 \cdot y_1 \cdot 0 - 1 \cdot w_0^2 \cdot \sin(y_1) - k \cdot y_0 + a \cdot \sin(w_1 \cdot t) \\ y_0 \end{bmatrix}$$

$Z := \text{rkfixed}(y,0,49.9,2000,D)$

$Z =$





A.

wr

```

w0 ← √(g/l)
h ← 0.025
d ← 0.1
w ← w0 • 0.1
v ← π/24
phi ← 0
i ← 0
m ← l • sin(phi)
while i < n
    t ← h • (a • sin(w • i • h) - w0² • sin(phi))
    phi ← phi + h • v
    v ← v + t
    i ← i + 1
    if (l • sin(phi) > m)
        m ← l • sin(phi)
m

```

=0.052

$\frac{w}{w_0}$

$\delta := 0.5$

$n := 2000$

$h := 0.025$ $m := 20$

$$R(t,y) := \begin{bmatrix} \frac{-g}{l} \cdot y_1 \cdot 0 - 1 \cdot w_0 \cdot \sin(y_1) - k \cdot y_0 + a \cdot \sin(w \cdot t) \\ y_0 \end{bmatrix}$$

$$\left(A^{(i)}\right)_j := \frac{A0}{m \cdot \sqrt{\left(w0^2 - w_j^2\right)^2 + 4 \cdot b_i^2 \cdot w_j^2}}$$

$$t:=0,0.1..40=\begin{bmatrix}0\\ \vdots\end{bmatrix}$$

$d:=0.1$

$w0:=\sqrt{\frac{g}{l}}$

$w:=w0$

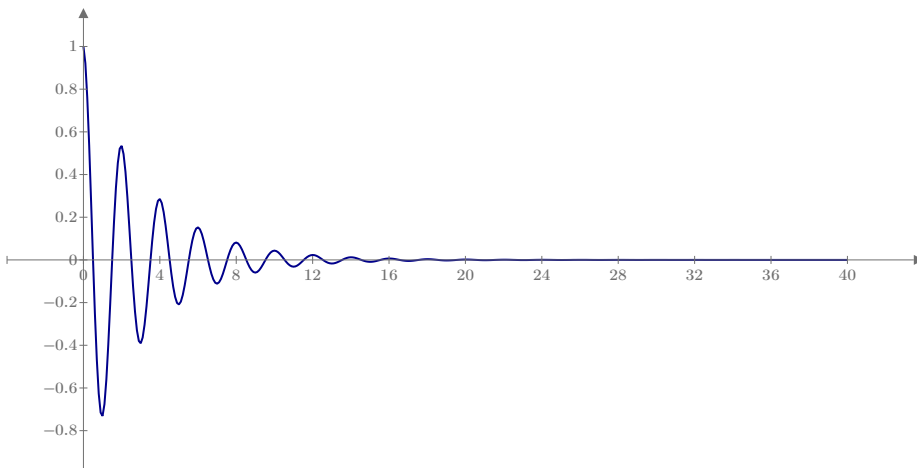
$f:=0$

$m:=1$
 $l:=1$

$A0:=l$

$b:=d \cdot w0$

$$X(t) := A0 \cdot e^{-b \cdot t} \cdot \cos(w \cdot t + f)$$



$X(t_i)$

$$\underline{t_i}$$

$$\textcolor{red}{n}:=1000$$

$$\textcolor{red}{m}:=3 \qquad step:=\frac{m}{n}=0.003$$

$$k1:=0,s$$

$$\textcolor{red}{k}:=0,step..m=\begin{bmatrix} 0 \\ 0.003 \\ 0.006 \\ \vdots \end{bmatrix}$$

$$z(t):=3\cdot\frac{t}{m} \qquad z(k)=\begin{bmatrix} 0 \\ 0.003 \\ 0.006 \\ \vdots \end{bmatrix}$$

$$w1:=$$

$$d1:=$$

$$\textcolor{red}{w}:=w0\cdot k=\begin{bmatrix} 0 \\ 0.009 \\ 0.019 \\ \vdots \end{bmatrix}$$

$$\textcolor{red}{d}:=0,0.01..10=\begin{bmatrix} 0 \\ \vdots \end{bmatrix}$$

$$b1$$

$$\textcolor{red}{b}:=w0\cdot d$$

$$A_1:=\left\| \begin{array}{l} j\leftarrow 0 \\ \text{while } j\leq 320 \\ \left\| \begin{array}{l} (A)_j\leftarrow \frac{A0}{m\cdot\sqrt{\left(w0^2-w1_j^2\right)^2+4\;b1_0^2\cdot w1_j^2}} \\ j\leftarrow j+1 \end{array} \right\| \\ A \end{array} \right\|$$

$$A_2:=\left\| \begin{array}{l} j\leftarrow 0 \\ \text{while } j\leq n \\ \left\| \begin{array}{l} (A)_j\leftarrow \frac{A0}{m\cdot\sqrt{\left(w0^2-w2_j^2\right)^2+4\;b2_0^2\cdot w2_j^2}} \\ j\leftarrow j+1 \end{array} \right\| \\ A \end{array} \right\|$$

$$A_5:=\left\| \begin{array}{l} j\leftarrow 0 \\ \text{while } j\leq n \\ \left\| \begin{array}{l} (A)_j\leftarrow \frac{A0}{m\cdot\sqrt{\left(w0^2-w_j^2\right)^2+4\;b_{15}^2\cdot w_j^2}} \\ j\leftarrow j+1 \end{array} \right\| \\ A \end{array} \right\|$$

$$A_6:=\left\| \begin{array}{l} j\leftarrow 0 \\ \text{while } j\leq n \\ \left\| \begin{array}{l} (A)_j\leftarrow \frac{A0}{m\cdot\sqrt{\left(w0^2-w_j^2\right)^2+4\;b_{20}^2\cdot w_j^2}} \\ j\leftarrow j+1 \end{array} \right\| \\ A \end{array} \right\|$$

$$A_9:=\left\| \begin{array}{l} j\leftarrow 0 \\ \text{while } j\leq n \\ \left\| \begin{array}{l} (A)_j\leftarrow \frac{A0}{m\cdot\sqrt{\left(w0^2-w_j^2\right)^2+4\;b_{50}^2\cdot w_j^2}} \\ j\leftarrow j+1 \end{array} \right\| \\ A \end{array} \right\|$$

$$A_{10}:=\left\| \begin{array}{l} j\leftarrow 0 \\ \text{while } j\leq n \\ \left\| \begin{array}{l} (A)_j\leftarrow \frac{A0}{m\cdot\sqrt{\left(w0^2-w_j^2\right)^2+4\;b_{100}^2\cdot w_j^2}} \\ j\leftarrow j+1 \end{array} \right\| \\ A \end{array} \right\|$$

$\parallel A$

$\parallel A$

$$\frac{w1_i}{w0}$$

$$\frac{w2_i}{w0}$$

$$\frac{w_i}{w0}$$

$$A_{1_i}$$

$$A_{2_i}$$

$$A_{3_i}$$

$$A_{4_i}$$

$$A_{5_i}$$

$$A_{6_i}$$

$$A_{7_i}$$

$$A_{8_i}$$

$$A_{9_i}$$

$$A_{10_i}$$

$$A_{11_i}$$

$$A_{12_i}$$

