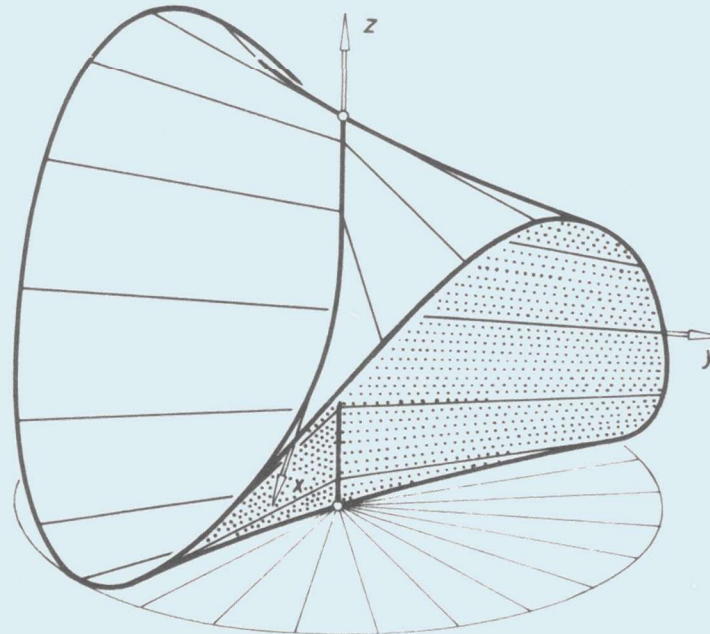
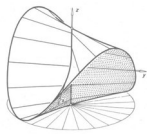


Numerische Methoden der Technischen Dynamik



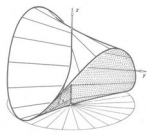


Inhalt (Teil 1): Verfahren für ODE (Ordinary Differential Equations)

- 1) **Mathematische Grundlagen**
- 2) **Numerische Zeitintegration: Prinzipielle Idee**
- 3) **Vier einfache Zeitintegrationsverfahren**
- 4) **Newton-Verfahren**
- 5) **Numerische Stabilität**
- 6) **Explizite Runge-Kutta-Verfahren**
- 7) **Mehrschrittverfahren**
- 8) **Steife Differentialgleichungen**
- 9) **BDF-Verfahren**
- 10) **Schrittweitensteuerung**
- 11) **Newmark-Verfahren**
- 12) **Finite-Elemente in der Zeit**
- 13) **Spezielle Integratoren**

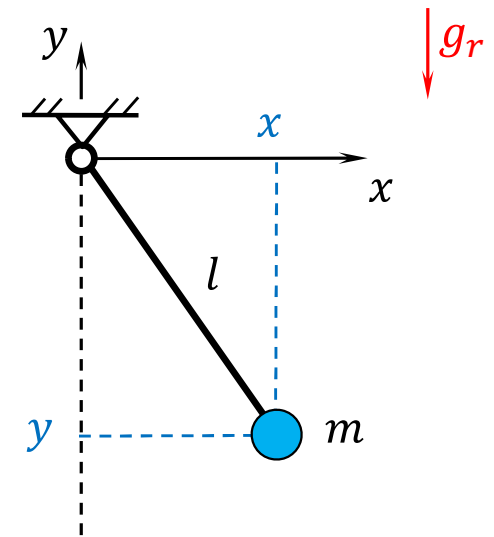
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Inhalt (Teil 2): Verfahren für DAE (Differential-Algebraic Equations)

- 1) Einführung in die Theorie von DAEs
- 2) Bewegungsgleichungen von mechanischen Systemen mit Nebenbedingungen
- 3) DAE-Integrationsmethoden:
Erklärt anhand des mathematischen Pendels
- 4) DAE-Integrationsmethoden:
Allgemeine Mehrkörpersysteme
- 5) Konvergenzanalysen



$$\begin{aligned}\dot{x} &= v && \text{algebraische Variable} \\ \dot{y} &= w \\ \dot{v} &= -\frac{2}{m} \cdot x \cdot \lambda \\ \dot{w} &= -g_r - \frac{2}{m} \cdot y \cdot \lambda \\ 0 &= x^2 + y^2 - l^2\end{aligned}$$

algebraische Gleichung

Literatur (Teil 2):

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