

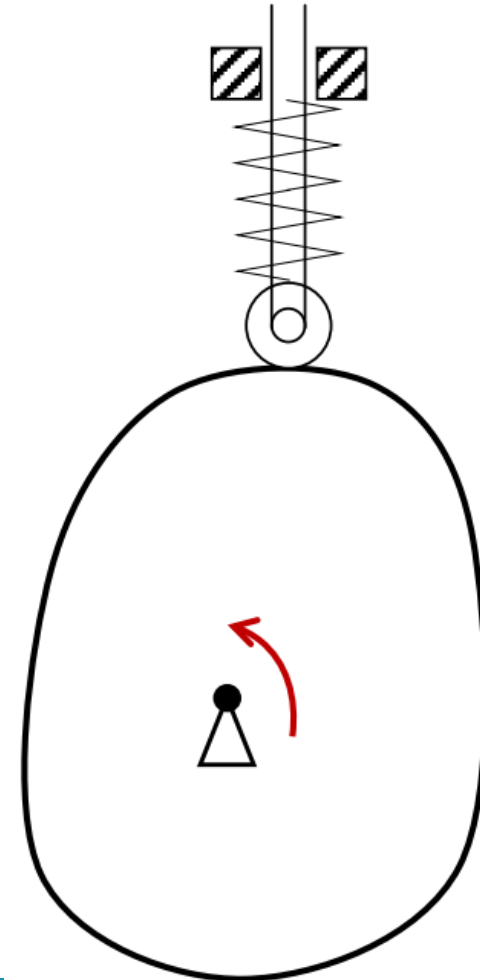
# Cams: Session 1

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Motion and Vibration: Part Motion

# Introduction

- Type of cam mechanism
  - Linear translating follower
  - $S = f(\theta)$ 
    - with  $S$ : displacement follower
    - and  $\theta$ : cam angle
- You will do both a synthesis and an analysis
- Focus on insight and reasoning!

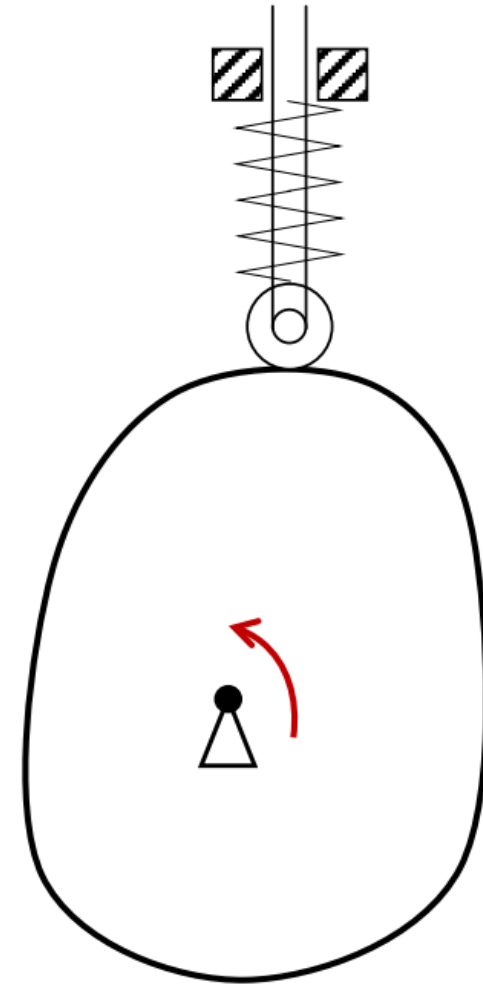


# Assignment

Four parts:

1. Define motion law ("*hefwet*") (Chapter 7)
2. Synthesis of cam- and follower geometry (Chapter 8)
3. Dynamical analysis with rigid follower (Chapter 8)
  - design spring to keep contact
  - design flywheel
4. Dynamical analysis with flexible follower (Chapter 9)
  - link with Vibrations ("*Trillingen*") course

Full assignment: on Toledo!



# Numerical data assignment

- On the 'announcement' section on Toledo, **one** of your group can subscribe for your **personal data number**
- Your numerical data can be found in the file *num\_data.html* on Toledo
  - contains desired displacements follower
  - contains functional forces on follower

# Matcam + manual

- Matlab function *matcam.m* offers support for:
  - Composing motion law (“*hefwet*”)
  - Determining geometry of cam + follower
  - Calculate contact forces
- Rest of the assignment, you will need to implement yourself
- Manual: check on Toledo!

# Important note

- For part one, keep this sentence in mind in the assignment:

*"De heffing wordt hier enkel gespecificeerd op de begin- en eindpunten van de verschillende segmenten. Het is vrij te kiezen hoe de heffing van begin- naar eindpunt verloopt"*

*[English]: "The different segments above indicate the start- and endpoints of the interval in which a certain rise or fall should be realized. The designer is free to choose how the rise or fall between the start and end points takes place"*

# Important note

- For completion of part four, you will need to make use of this table:

	$N$ [-]	$Q$ [-]
harmonic	2	$0.5 \cdot \pi^2$
cycloidal	3	$(2\pi)^2$
5 poly	3	60
7 poly	4	840

- Note: The table on slide 9-24 of the course notes does not contain information for 5th order polynomial

# Practicalities

- Deadline
  - cams: 13/5 (as announced on Toledo)
- Question sessions
  - cams: (to be confirmed on Toledo)
- Discussion forum for questions on linkages and cams outside exercise sessions
  - Asking in English may get you a faster response time!