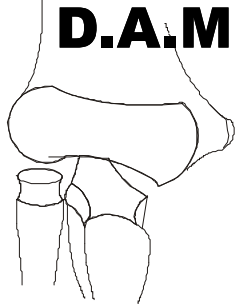



D.A.M CURSUS





Introductie 2011
Cursusavond 2

Vrijheidsgraden en Beperkingen



Twee dimensionaal: 3DF
Drie dimensionaal: 6DF




Aantal vrije elementen = 1 (3DF)
Aantal verbindingen = 1
som van de constraints in de verbindingen = 2



Aantal vrije elementen = 2 (samen 6 df)
Aantal verbindingen = 2
som van de constraints in de verbindingen = 4



Aantal vrije elementen = 3 (samen 9 df)
Aantal verbindingen = 3
som van de constraints in de verbindingen = 6





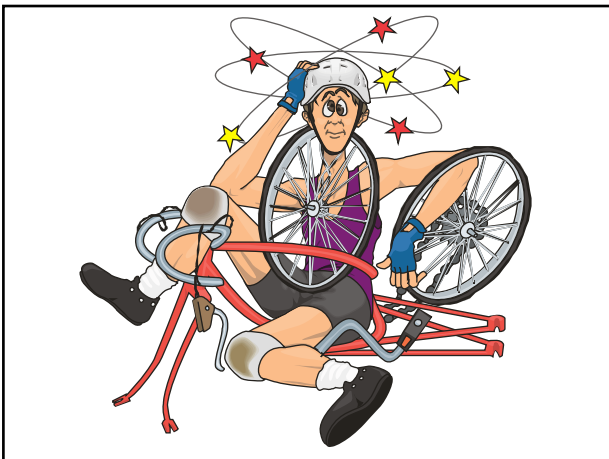
Bij een drie-dimensionale analyse:

$$DF = 6 \cdot (N - 1) - \sum C$$

Bij een twee-dimensionale analyse:

$$DF = 3 \cdot (N - 1) - \sum C$$

Vrijheidsgraden analyse van het fietsende been (twee dimensionaal)



Aantal elementen

1. Frame + Bekken $N = (5 - 1) = 4$

2. bovenbeen $DF = 4 \cdot 3 = 12$

3. onderbeen

4. Voet + trapper

5. Cranckstel

verbindingen

1. Heupgewricht **5 · 2 constraint = 10**
DF keten = 12 - 10 = 2

2. Kniegewricht

3. Enkelgewricht

4. Trapper-Cranck

5. Trap-as



De fiets 3D **Aantal elementen**

1. Frame + Bekken **N = (5 - 1) = 4**
DF = 4 · 6 = 24

2. bovenbeen

3. onderbeen

4. Voet + trapper

5. Cranckstel

De fiets 3D **verbindingen**

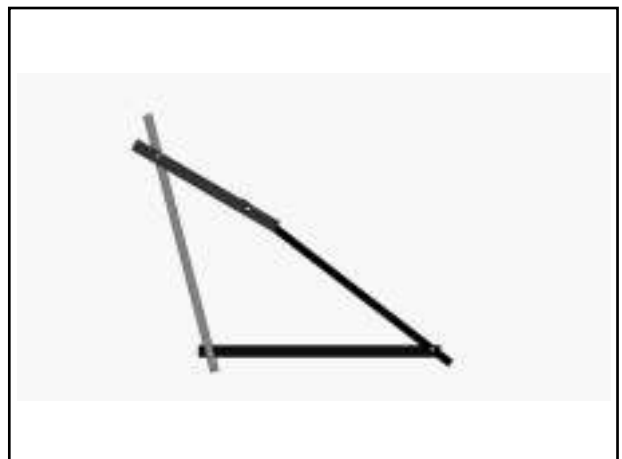
1. Heupgewricht **21 constraint**
3 constraints
DF keten = 24 - 21 = 3

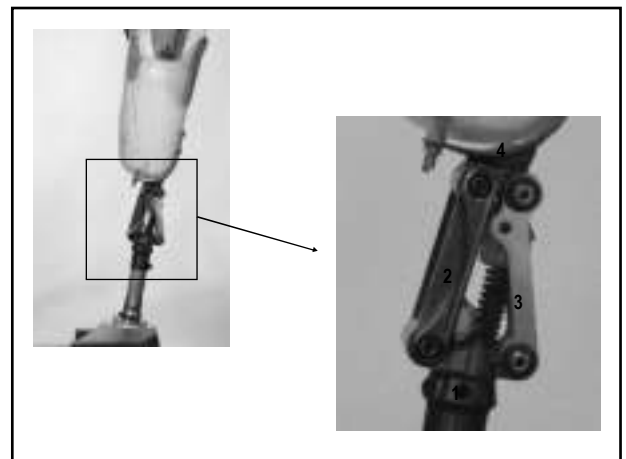
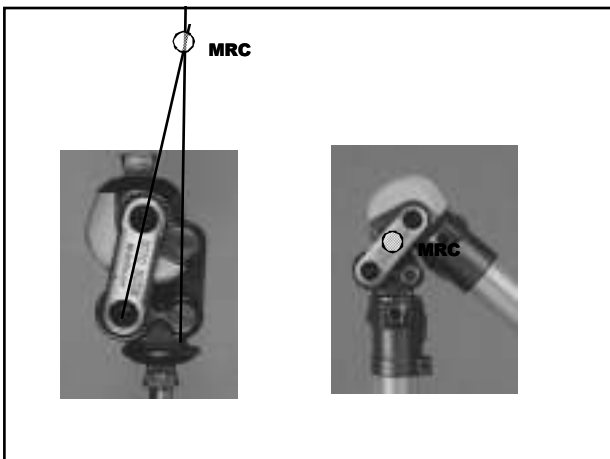
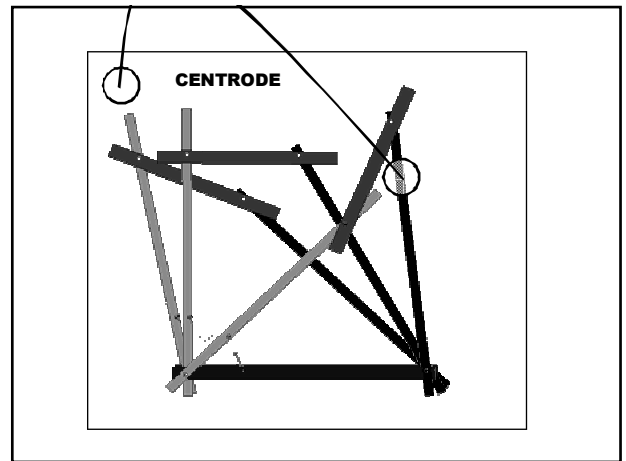
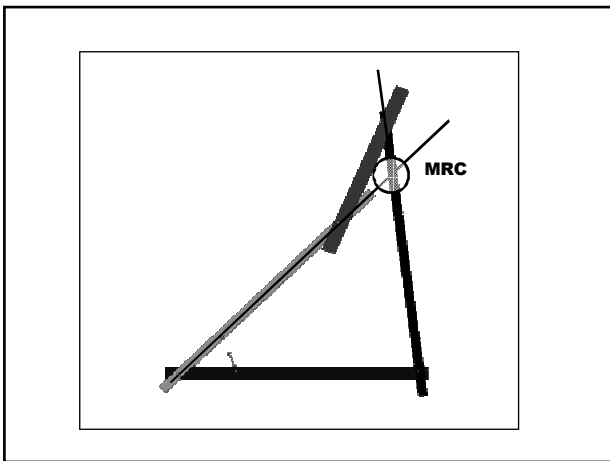
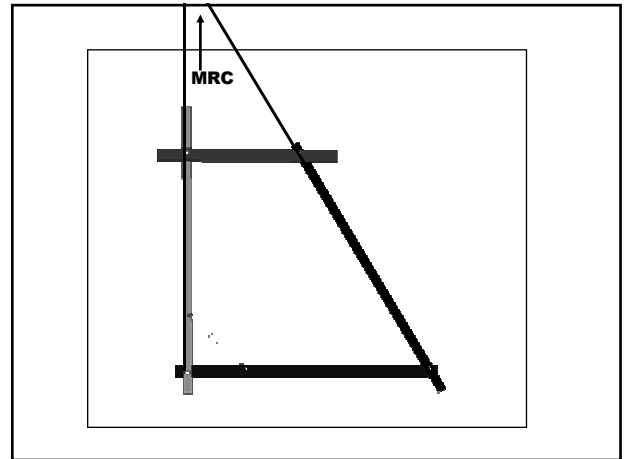
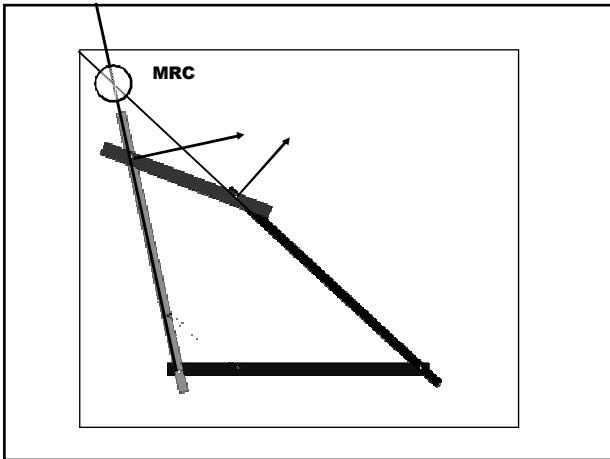
2. Kniegewricht
4 constraints

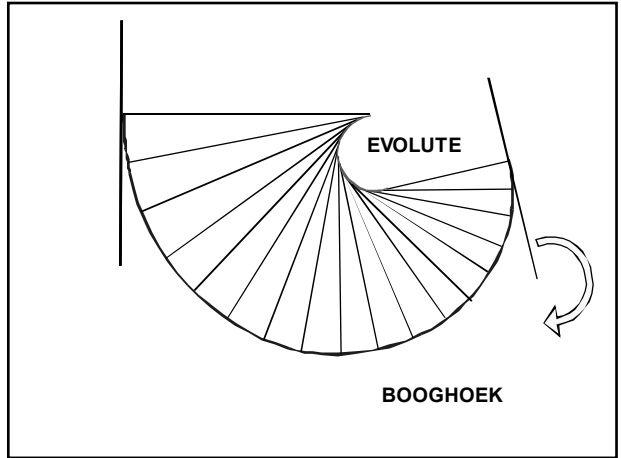
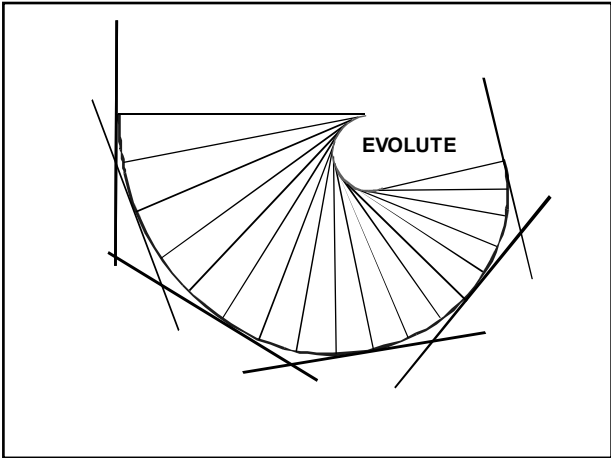
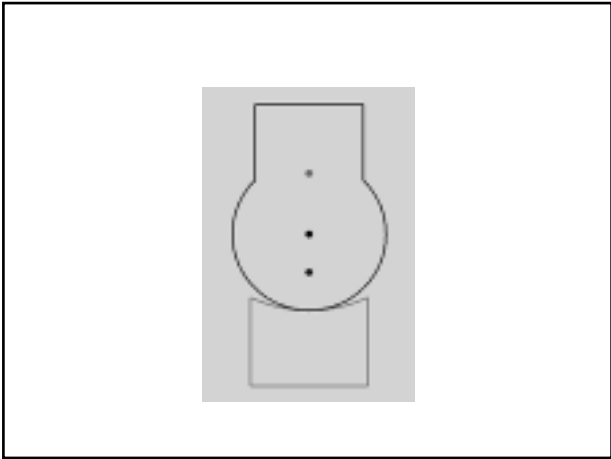
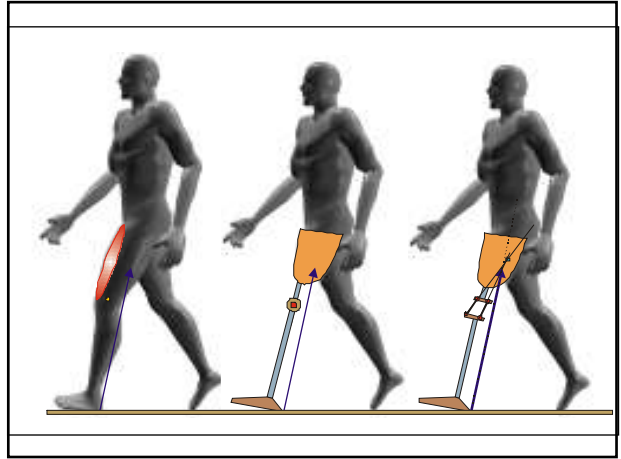
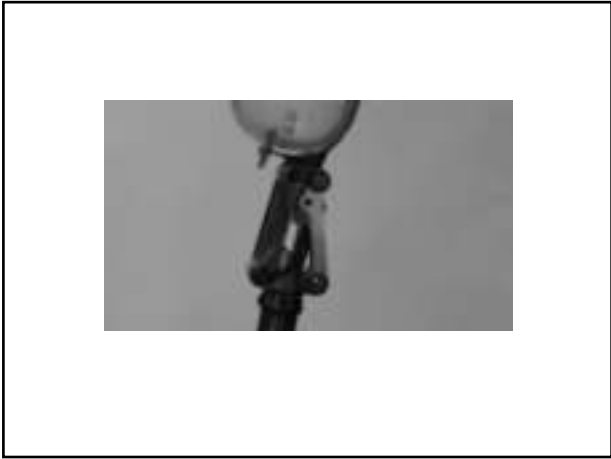
3. Enkelgewrichten
4 constraints

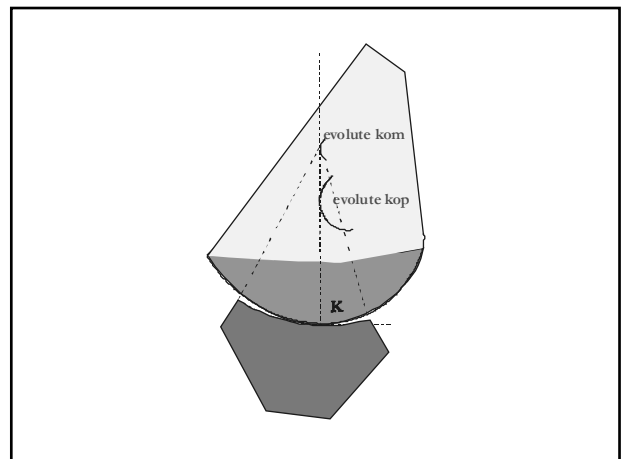
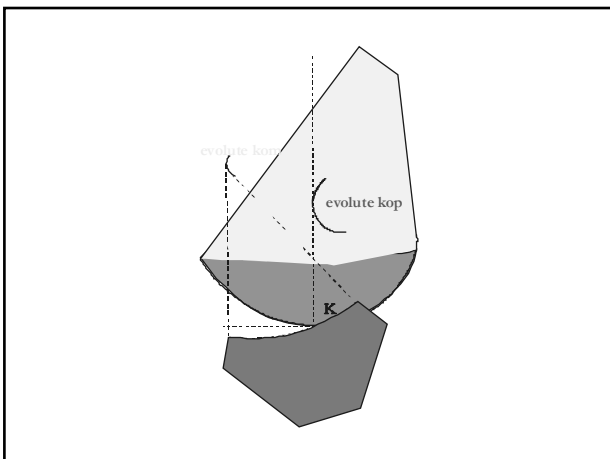
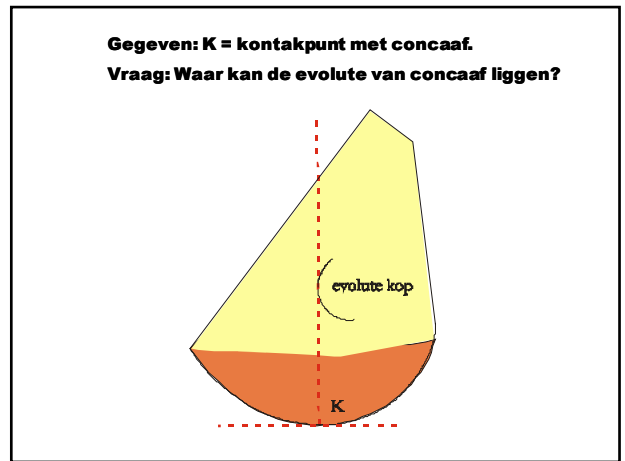
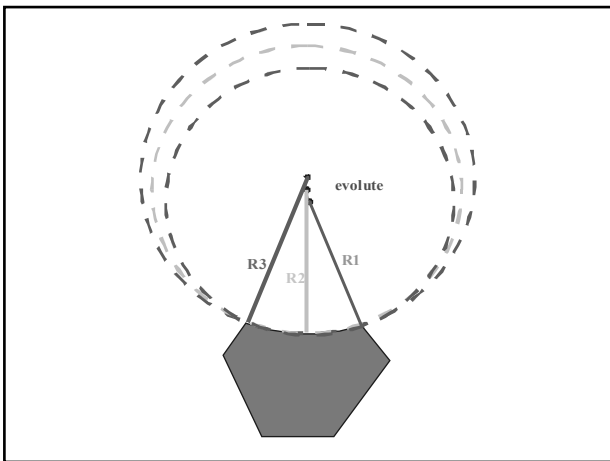
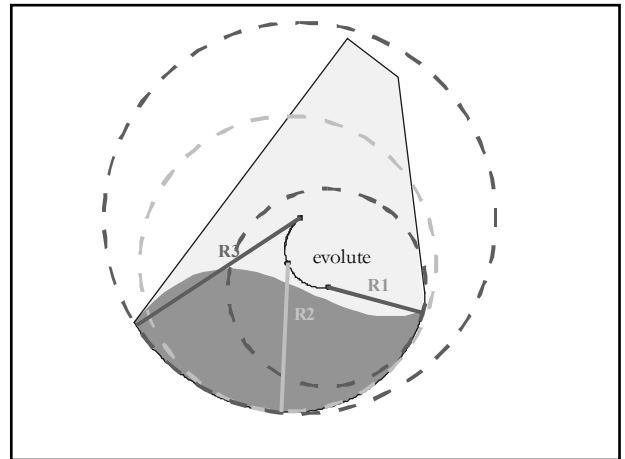
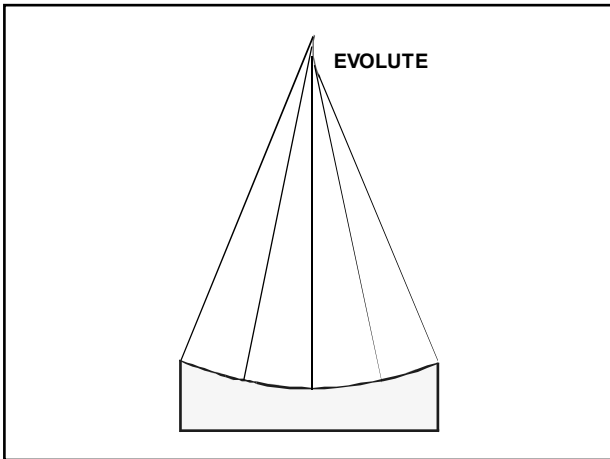
4. Trapper-Cranck
5 constraints

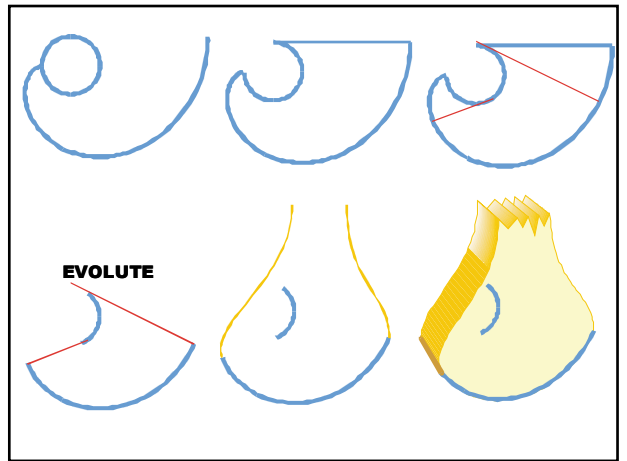
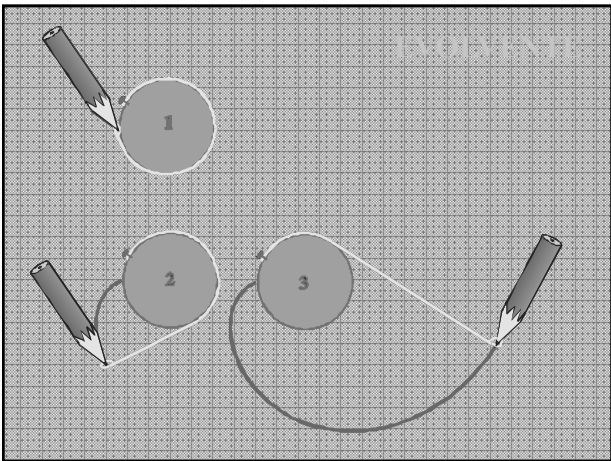
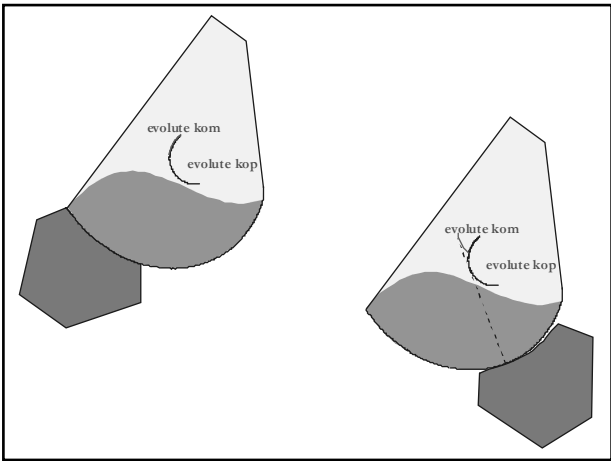
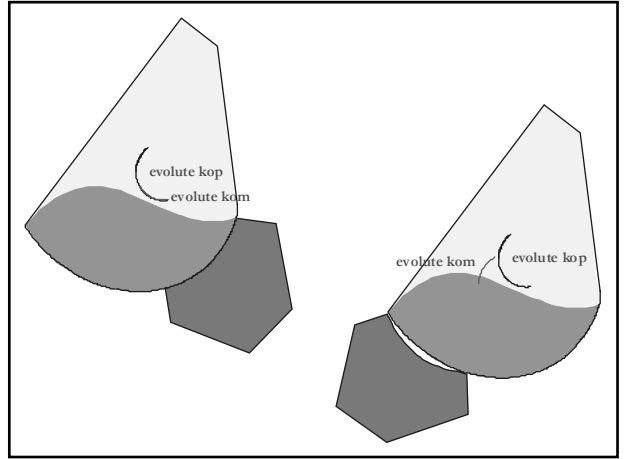
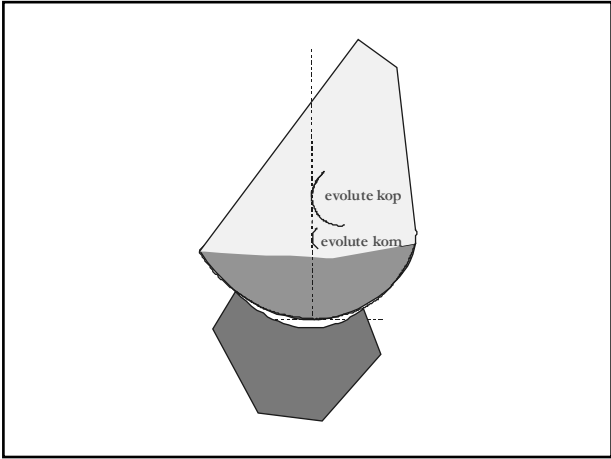
5. Trap-as
5 constraints

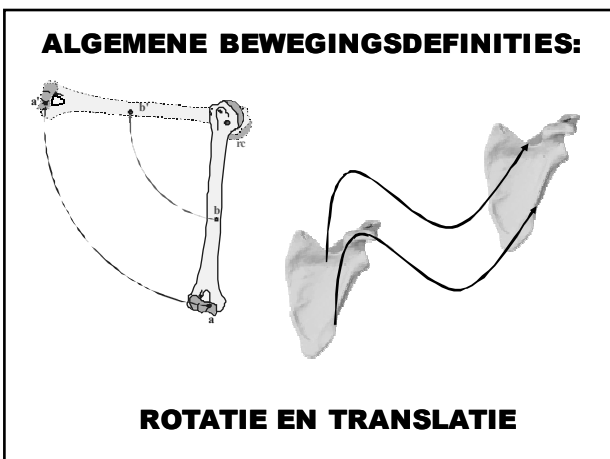
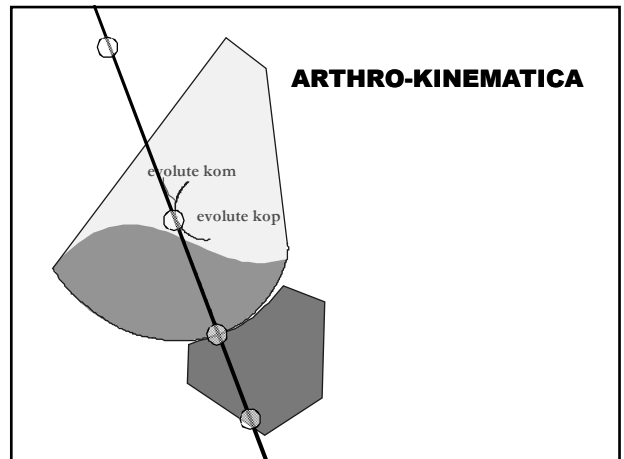
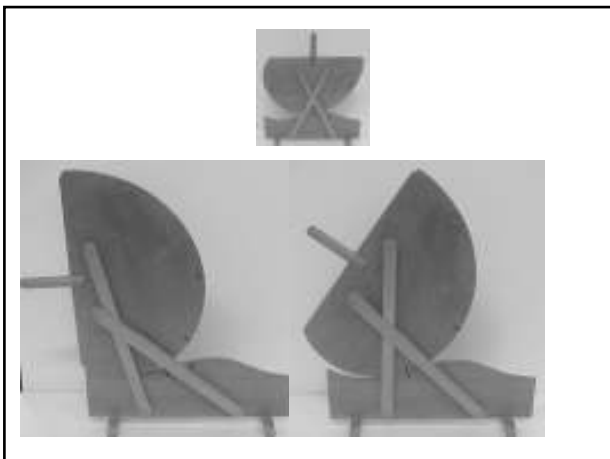
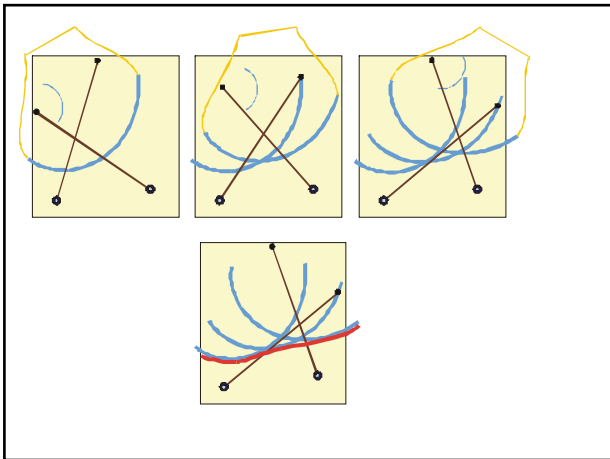












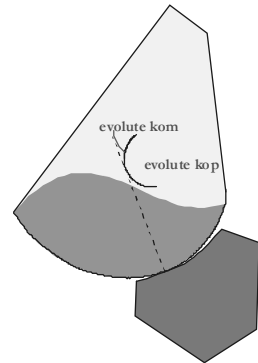
EISEN VOOR BEWEGINGSDEFINITIES:



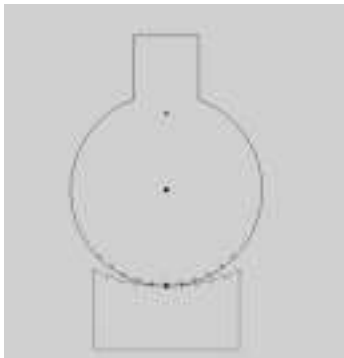
- 1. Eenduidige contactverplaatsingen
- 2. Convex t.o.v concaaf = concaaf t.o.v convex

BEWEGINGSDEFINITIES VOOR CONVEX:

- 1. ROL
- 2. SCHUIF

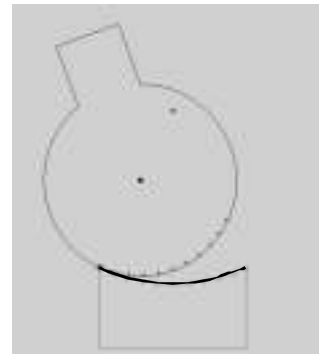


ROL



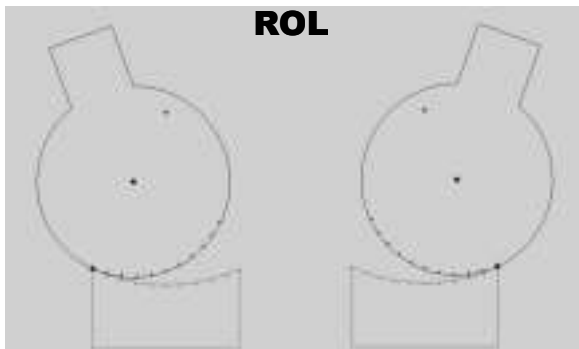
Afgelegde weg op kop en kom gelijk (homolateraal contact)

ROL



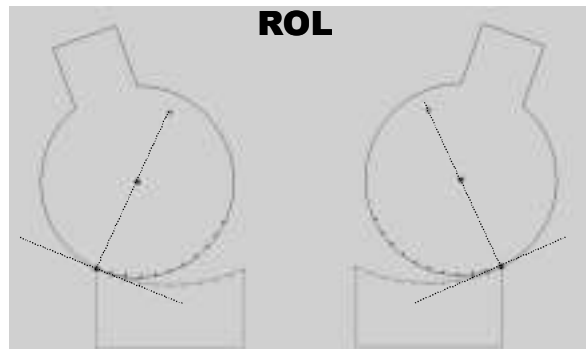
CENTRODE

ROL



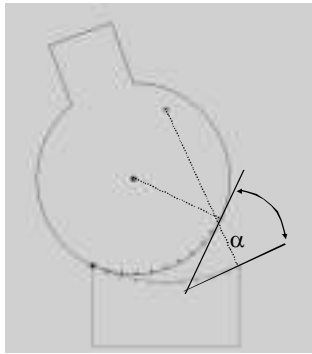
bewegingsuitslag

ROL



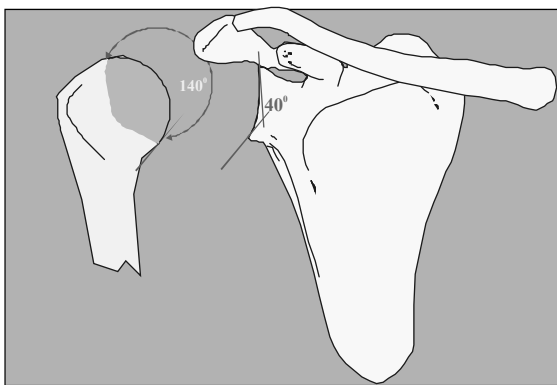
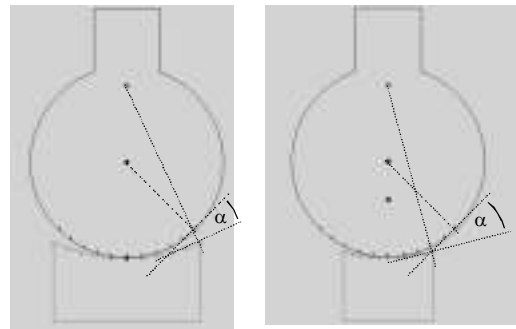
bewegingsuitslag

ROL



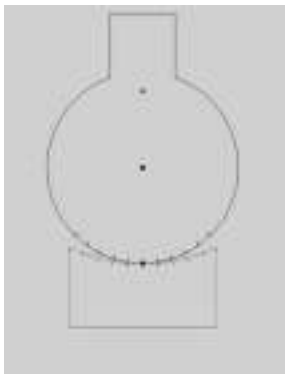
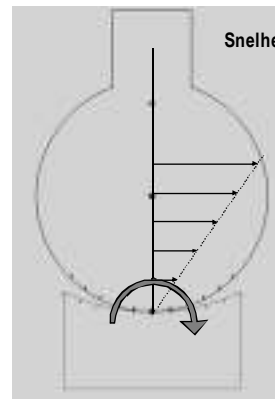
bewegingsuitslag

Welk gewricht is het lenigst?



Booghoek kop - booghoek kom = max. gewrichtshoek

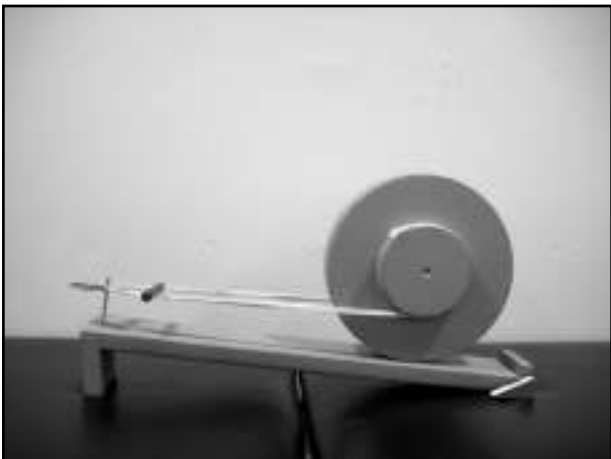
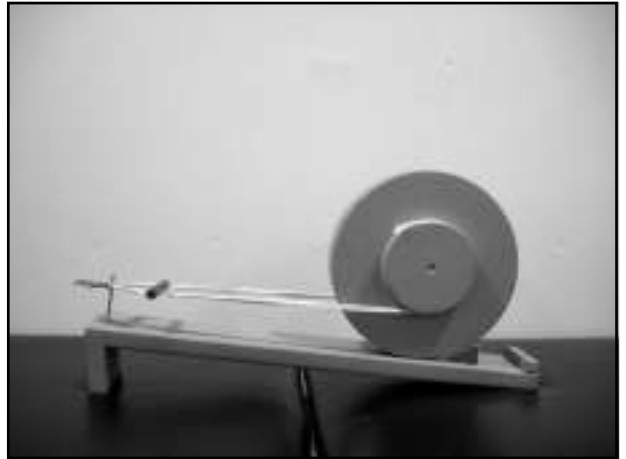
Snelheidsverdeling rol

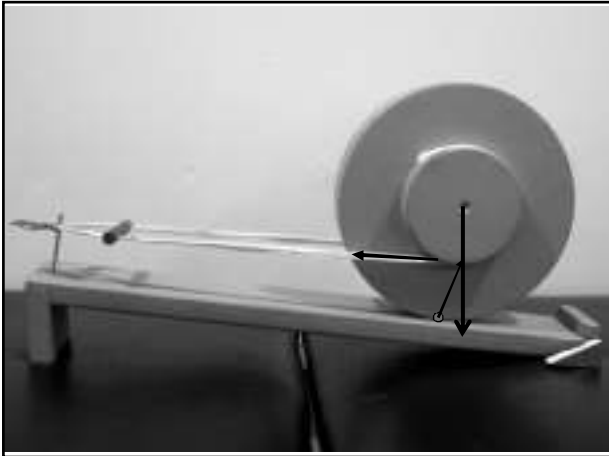


Rol van de kom = Schommel

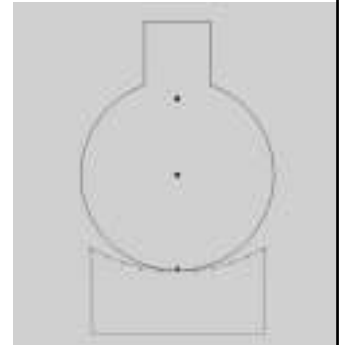






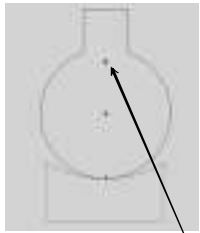


SCHUIF

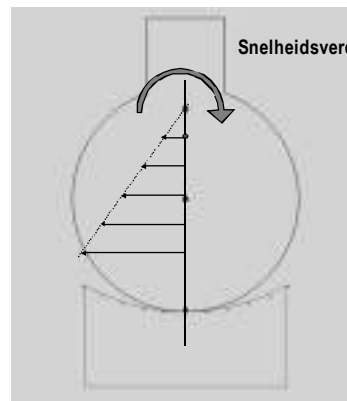
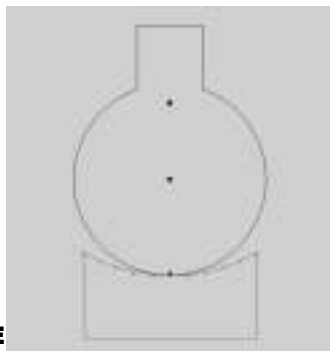


Een punt van convex langs meerdere punten van concaaf.

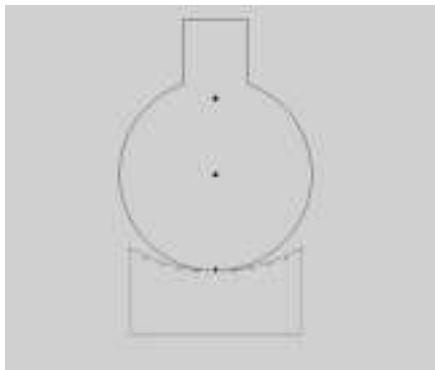
SCHUIF



CENTRODE



Snelheidsverdeling schuif



Schuif van de kom = Glij

