

**Class 2**  
*Problem Solving  
and  
Balance*

# Approaches to Problem Solving

What is not a good approach!

# Approaches to Problem Solving

What is a good approach...

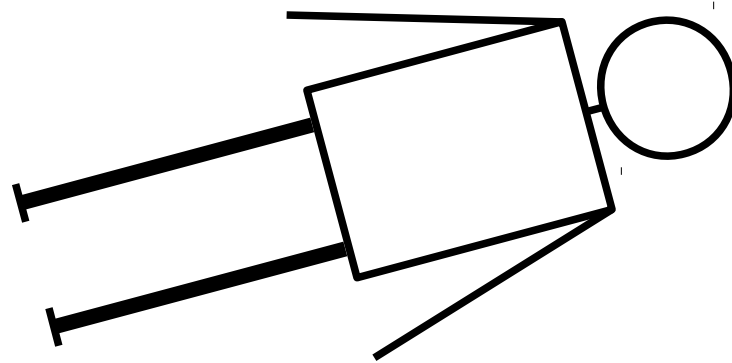
*Successful scientific experimentation is the result of a clear mind attacking a clearly stated problem and producing clearly stated conclusions* - Robert A. Day

# How to solve any\* problem

\*ok, not all, but most...

- 1) What is being asked?
- 2) What information is provided?
- 3) What is needed to get from the question to the answer?

How do I not fall down?



# Important Concepts of Balance

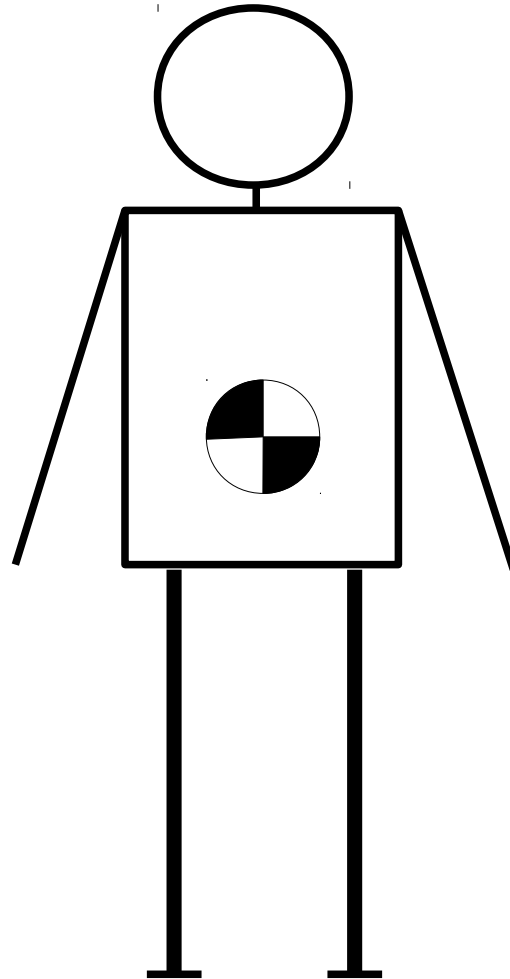
Center of Mass (CoM)

Base of Support (BoS)

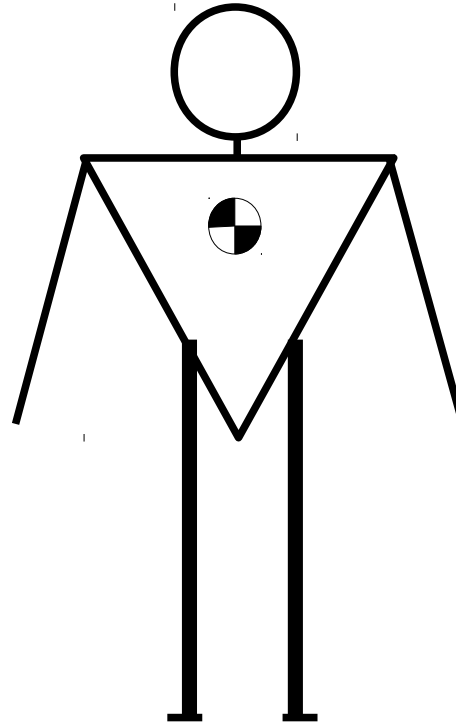
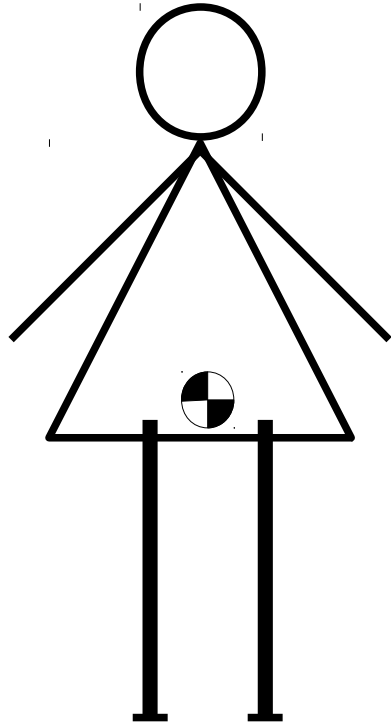
Center of Pressure (CoP)

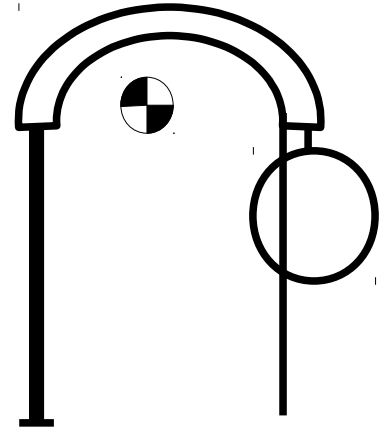
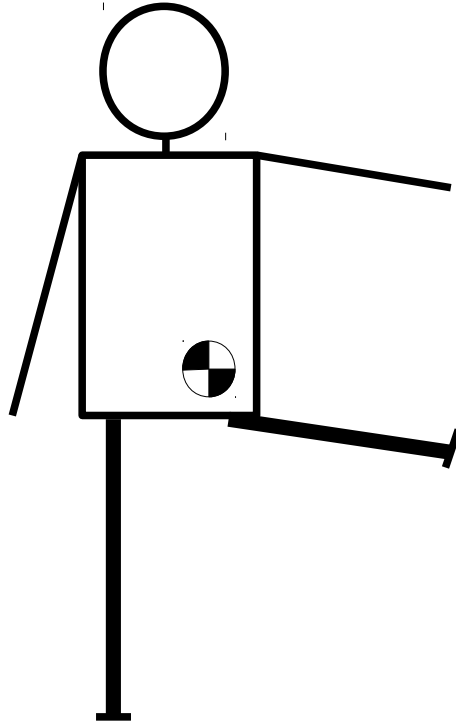
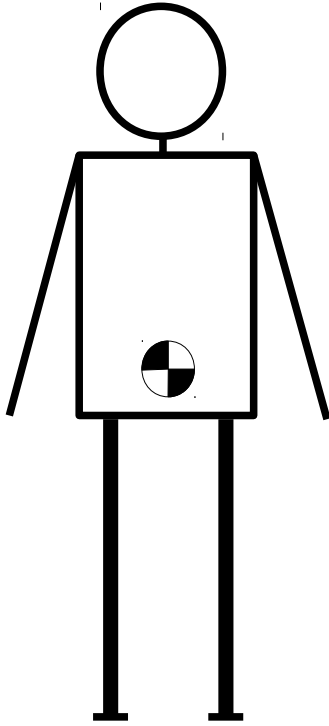
# Center of Mass (CoM)

The point at which all the body's mass seems to be concentrated\*



\*Kreighbaum and Barthels, 1996





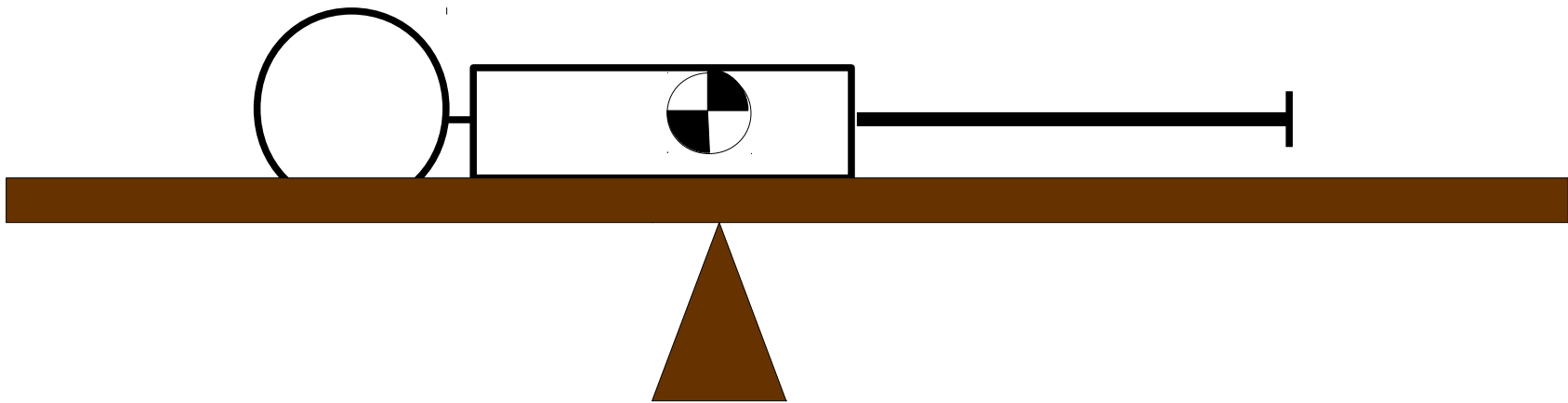
# Center of Mass (CoM)

The balance point of the body\*

*Balance a pencil*

# Center of Mass (CoM)

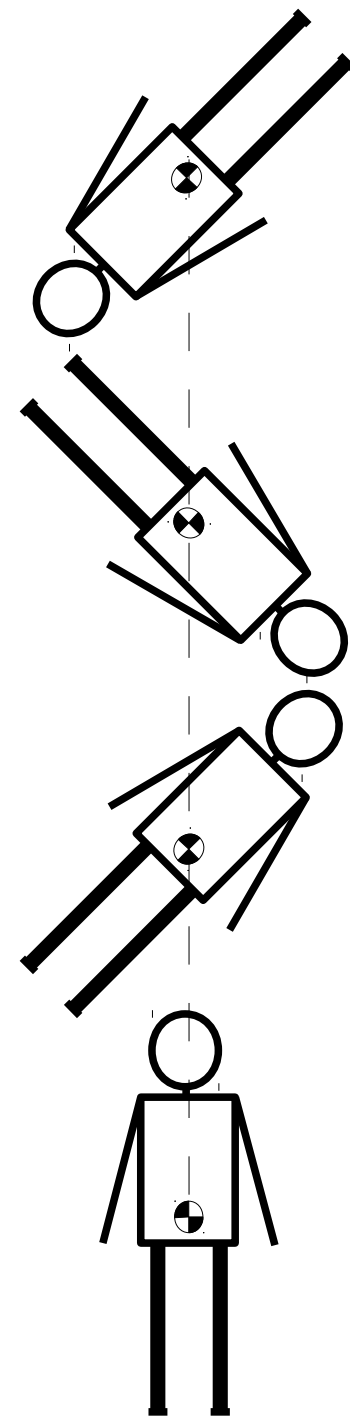
The balance point of the body\*



\*Kreighbaum and Barthels, 1996

# Center of Mass (CoM)

The point around which the sum of the torques or the segmental weights is equal to zero\*



\*Kreighbaum and Barthels, 1996

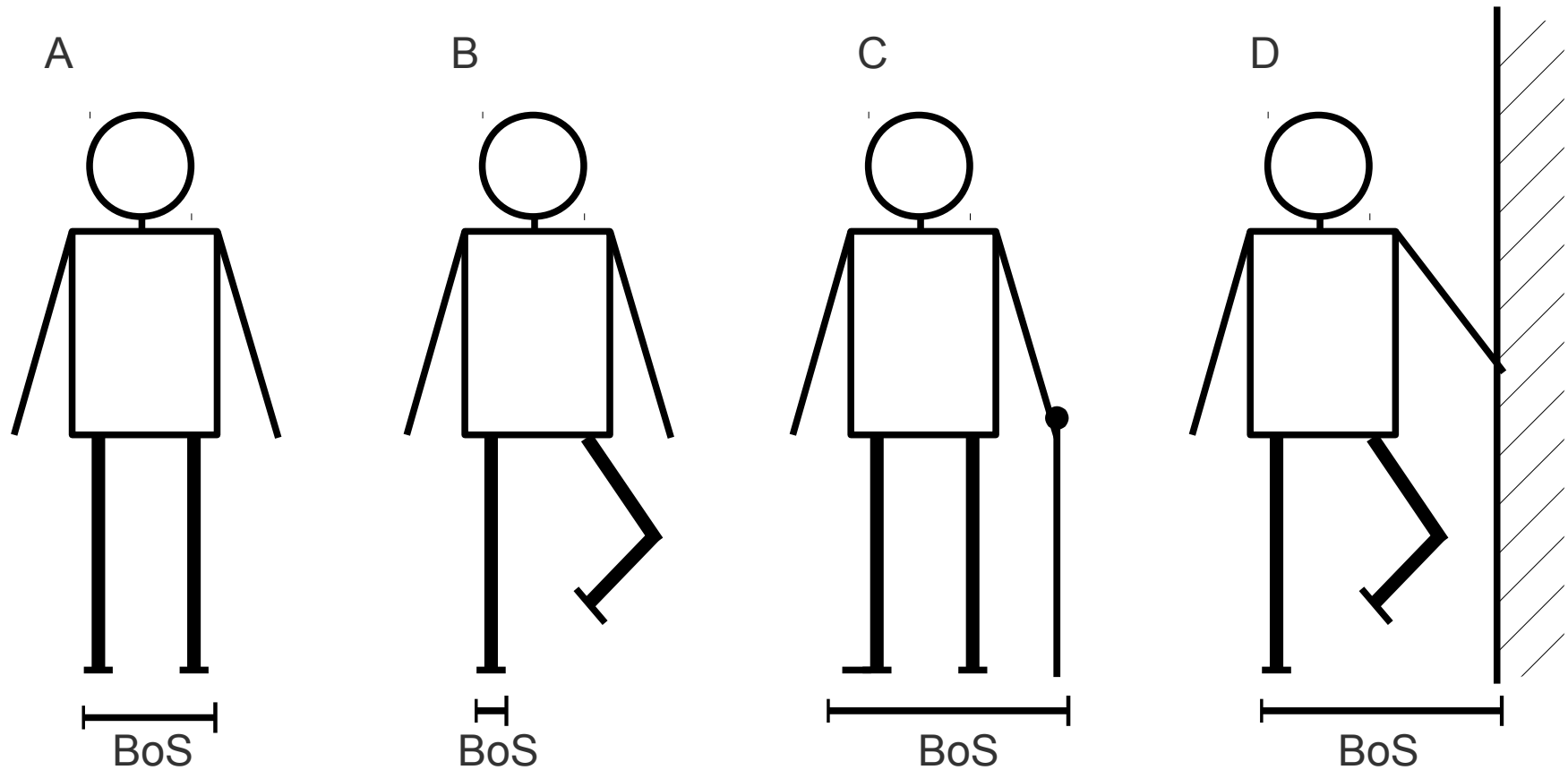
# Base of Support (BoS)

The region bounded by body parts in contact with some resistive surface that exerts a reaction force against the body\*

*Hands pushing against each other*

# Base of Support (BoS)

The region bounded by body parts in contact with some resistive surface that exerts a reaction force against the body\*



\*Kreighbaum and Barthels, 1996

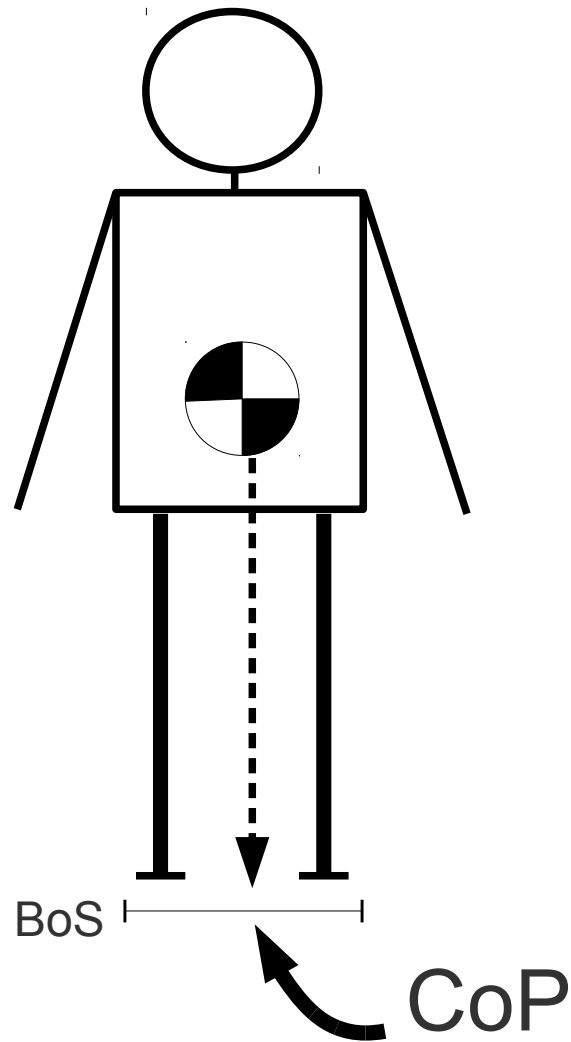
# Center of Pressure (CoP)

The point of application of the sum of all ground reaction forces

*Restaurant bill*

# Center of Pressure (CoP)

The CoP is necessarily within the Base of Support



# During static balance

The CoP is vertically aligned with the CoM

