

# Statics

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# Concepts

- Mechanical Systems
- Forces; External, Distributed, Resultant
- Moments; Couples
- Action & Reaction
- Equilibrium  $\Sigma F = 0$ ,  $\Sigma M = 0$
- 2 Force Members
- Trusses
- Friction
- Fluid Statics

# More Concepts

- Centroids, Area Moments of Inertia
- Shear and Bending Moment Diagrams

# Tools

- Free Body Diagrams
- Vector manipulations (addition, scalar multiplication, components, dot & cross products)
- Moments (vector cross-products)
- Resultant forces and moments (vector additions)
- Algebra

# Procedures

- 1. Define Mechanical System
  - Specify included objects
- 2. Draw free body diagram
  - External forces exploiting action/reaction
- 3. Construct equations
  - Sum forces, moments, friction as needed.
- 4. Manipulate Equations
- Repeat as necessary with additional mechanical systems

# Questions

- Anything on the previous slides that introduces the slightest concern or question on your part?
- Questions on anything not mentioned but you think it might be related to statics?
- Questions on anything?

# Examples

- Selected from your requests and/or Sample Examinations by Lindeburg.