

Static Equilibrium Problems Methods

The Model

For any rigid body that is not moving, and remains not moving, the net force on the system in every direction and the net torque around any axis must be zero. We can use these facts to analyze the forces acting on such a system.

Problem Solving Steps

- 1) Organize and Plan
 - a. Draw a clear diagram that includes all forces and indicates where they are applied on the object.
 - i. Weight forces should be drawn so they act through the center of mass of the object.
 - b. Choose, and indicate on your diagram, an axis of rotation, usually at the location of an unknown force (since the torque caused by the unknown force will be zero).
- 2) Solve
 - a. Write expressions for the net force in the x and y directions, and the net torque, and set all expressions equal to zero.
 - b. Use algebra to solve for what you don't know
- 3) Reflect
 - a. Does the answer make sense?
 - b. Are the units correct?
 - c. Did you use any new techniques?
 - d. Any other insights?