- torque → statics
  - angular momentum $I$
  - acceleration $\dot{\alpha}$
- harmonic oscillators
  (Young's modulus)
Statics: Forces sum to zero

Moments sum to zero.

What are all the forces acting?
mechanical advantage
Stable: $|T_2| = 1 \text{mN}\cdot \text{g}$

Torque: $T_2 = \phi \cdot 1 \text{mN}\cdot \text{g}$

Ref. pt.: $F_2$ (put it here, b/c we don't know $F_2$)
\[ T_2 L + m_b g \frac{L}{2} - T_1 L \sin \theta = 0 \] (torque)

\[ F_x = -T_1 \cos \theta + F_{px} = 0 \] (x-component of the unknown force)

\[ F_y = -m_b g - T_2 + T_1 \sin \theta + F_{py} = 0 \]

\[ T_2 - m_s g = 0 \] (sign is static too!)
\[ T_2 = mg \checkmark \]

\[ T_1 \tan \theta = mg \frac{1}{2} + \frac{1}{2} m_b g \]

\[ T_1 = mg \frac{1}{2} + \frac{1}{2} m_b g \]

\[ F_{px} = T_1 \cos \theta = \left[ mg \frac{1}{2} + \frac{1}{2} m_b g \right] \frac{\cos \theta}{\sin \theta} \]

\[ F_{py}: \frac{1}{2} m_b g - mg + \left( mg + \frac{1}{2} m_b g \right) + F_{py} = 0 \]

\[ F_{py} = \frac{1}{2} m_b g \]