

Two-Force Members

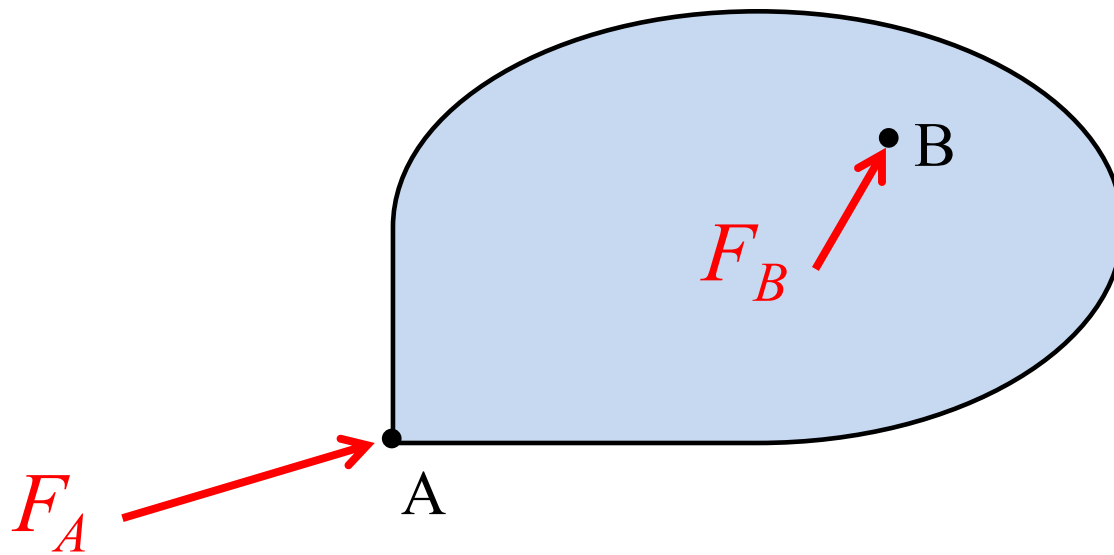
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Notes Regarding Two-Force Members

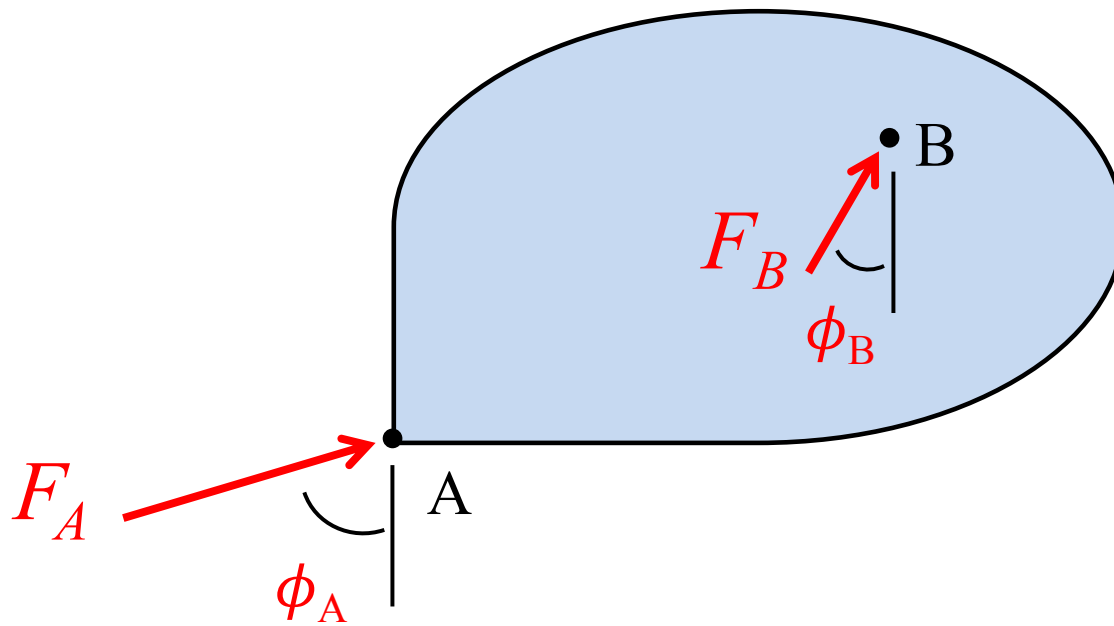
- Identifying two-force members in statics analysis is not strictly necessary;
- Identifying two-force members is usually advantageous as it often simplifies the analysis and reduces the possibility of making errors;
- Look for members that satisfy the following;
 1. Members whose weight is negligible,
 2. Members connected by exactly two pin connections,
 3. Members with no applied loading between connections.

Exactly Two Forces Applied to the Member

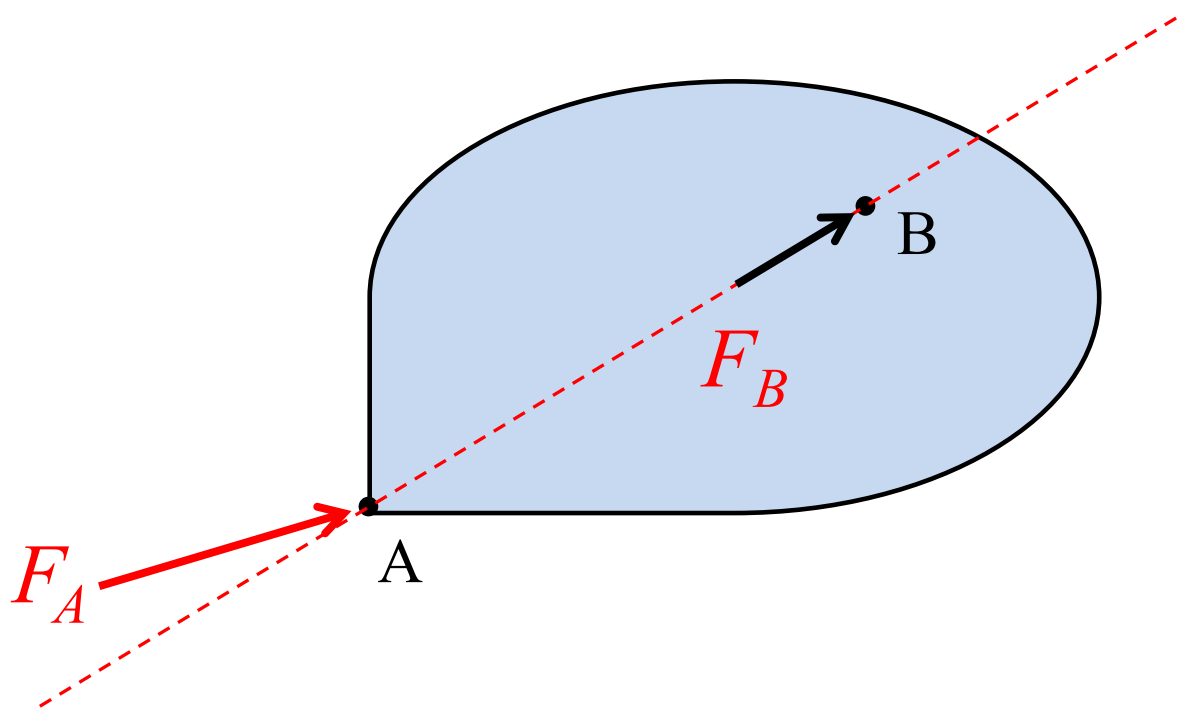


4 Unknowns

3 Independent Equations of Equilibrium

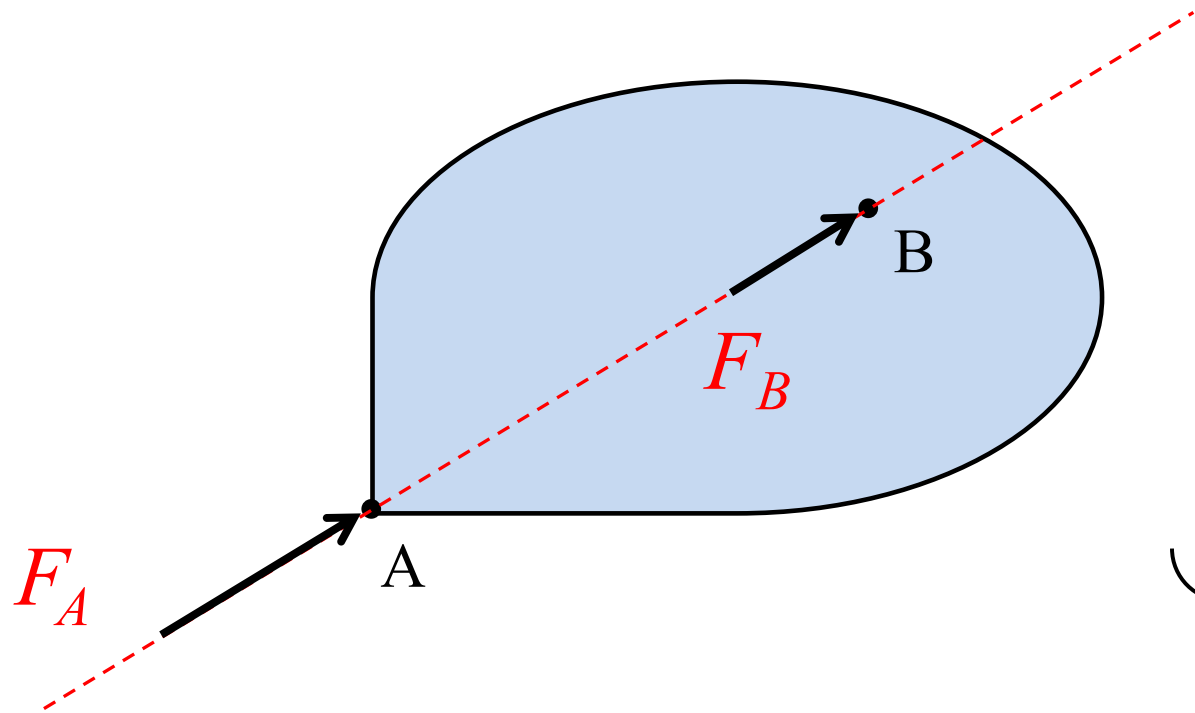


Satisfy Moment Equilibrium about Point A



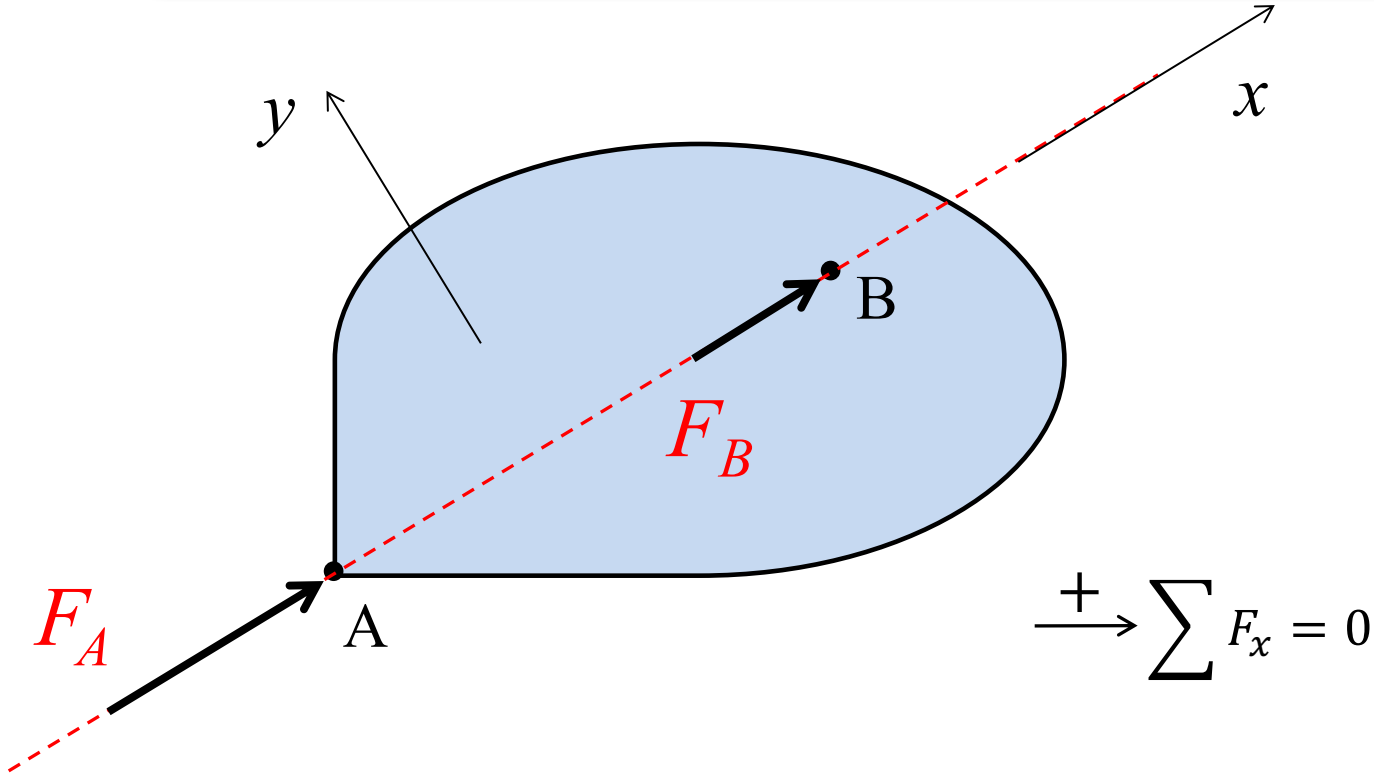
$$\curvearrowright \sum M_A = 0$$

Satisfy Moment Equilibrium about Point B

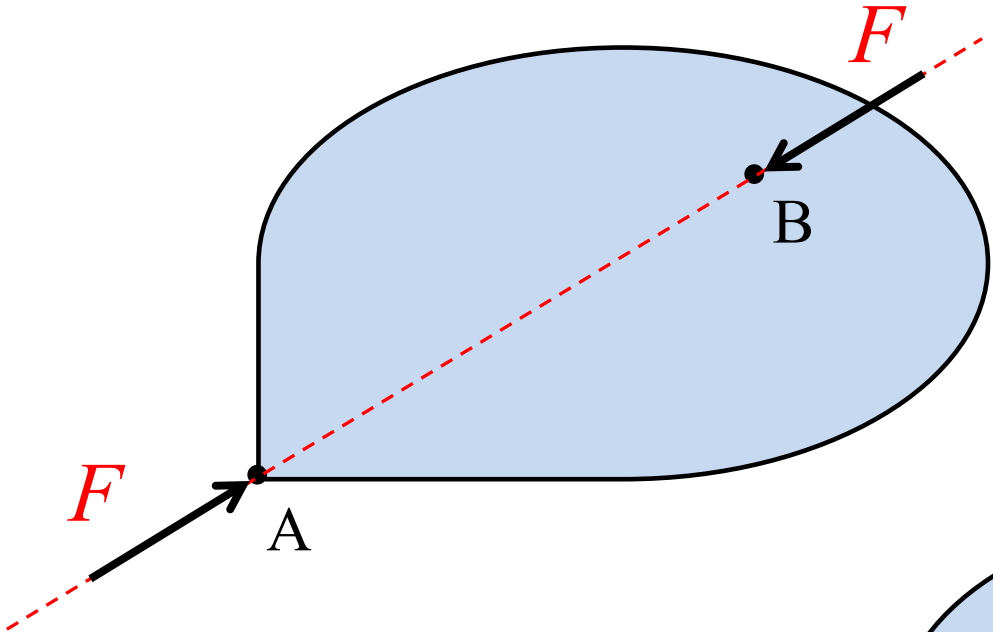


$$\sum M_B = 0$$

We can define our coordinate system to line up with AB

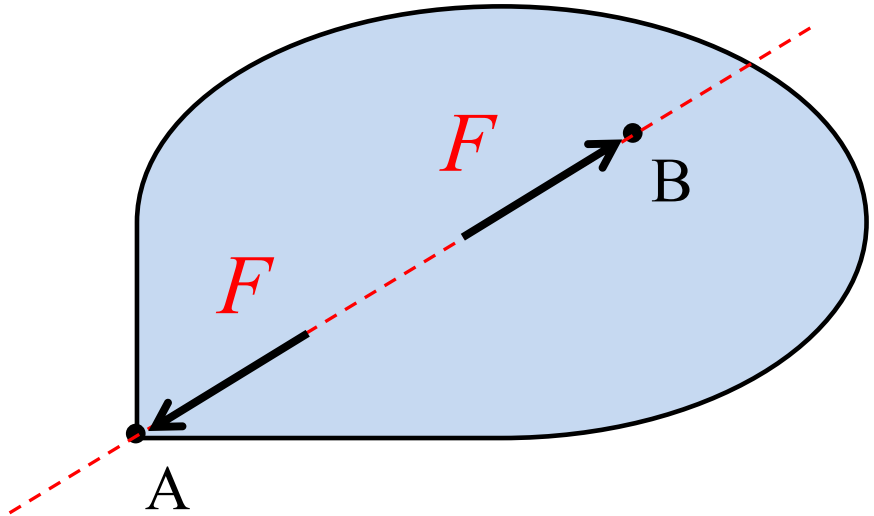


Two possibilities for Equilibrium for Two-Force Members

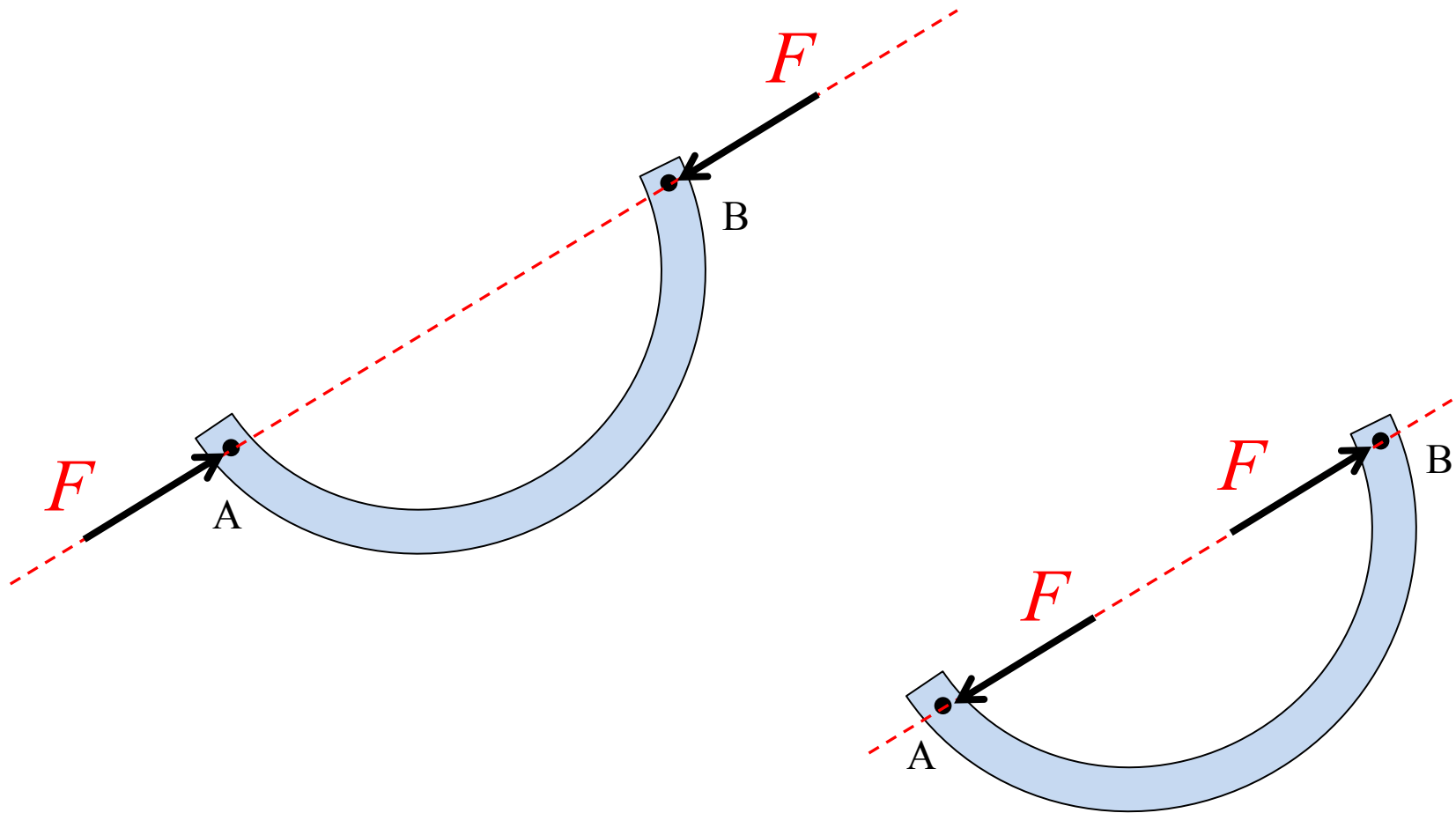


The only unknown remaining is the magnitude of the force

or



Note that the shape of the two-force member does not change the result





Braces in frames to resist seismic loads are often idealized as two-force members

