To do ...

- Quiz 2 this week (Tues-Sat)
- HW 7 ME due Thurs
- WA 4 due Sun
- HW 8 PL due Tues
Moving a force on its line of action
Moving a force off of its line of action

\[ M = Fd \]
Equipollent (or equivalent) force systems

A force system is a collection of forces and couples applied to a body.

Two force systems are said to be equipollent (or equivalent) if they have the same resultant force AND the same resultant moment with respect to any point $P$. 
What is the equivalent system?
Replace the force and couple system acting on the member by an equivalent force and couple moment acting at point O.
Replace the force system acting on the post by a resultant force and resultant moment about point A, and specify where its line of action intersects the post AB measured from point A.
Forces and couple moments are applied to the pipe. Find an equivalent resultant force and couple moment at point O.
Reduction of a simple distributed load
Reduction of a simple distributed load

In structural analysis, we often are presented with a distributed load $w(x)$ (force/unit length) and we need to find the equivalent loading $F$.

Example of such forces are winds, fluids, or the weight of items on the body’s surface.
Triangular loading

\[ w(x) \]

\[ w(L) = w_0 \]
Rectangular loading

\[ w(x) = w_0 \]