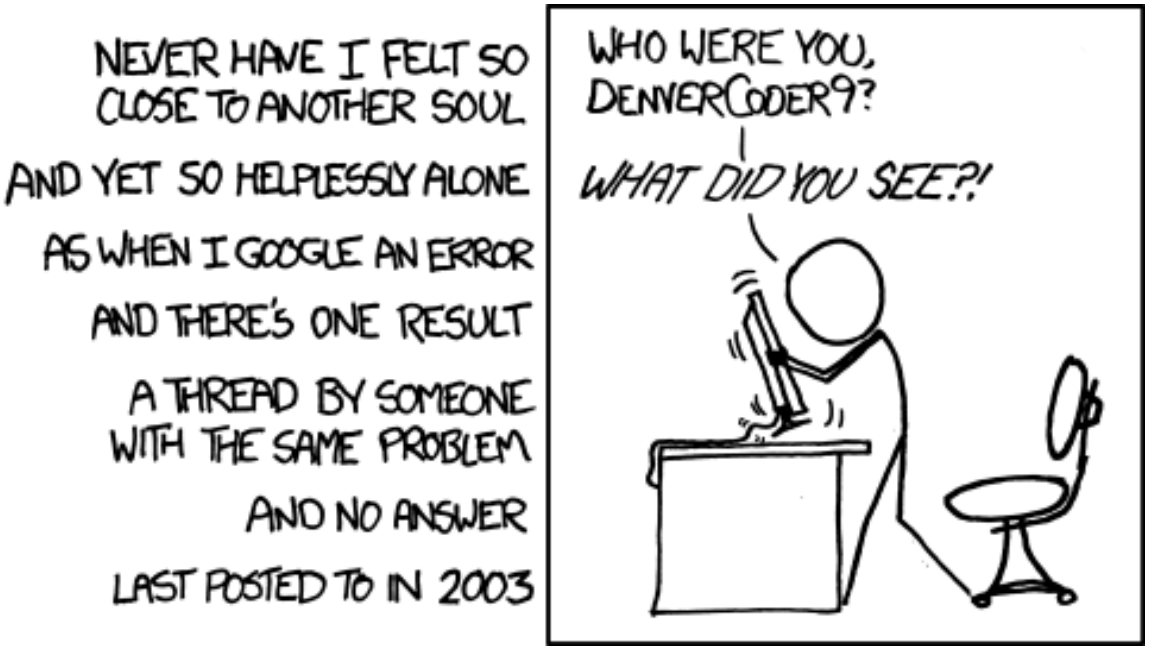
Announcements

- Written Assignment 1 due today
- Piazza etiquette

❑ Upcoming deadlines:

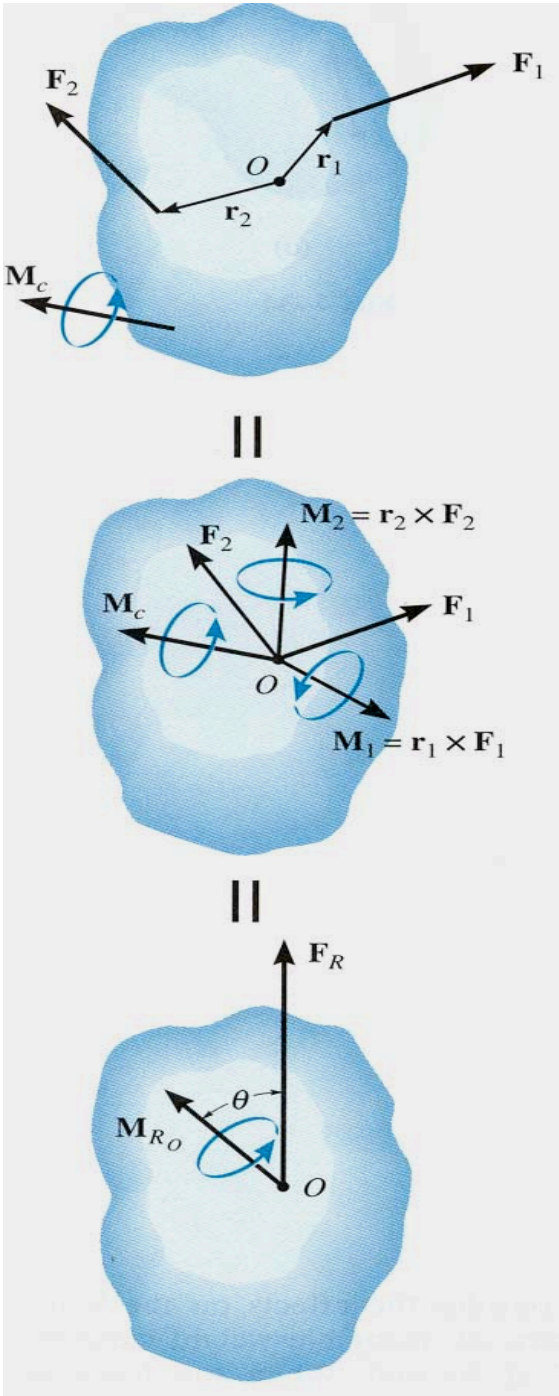
- Tuesday (9/26)
  - PL HW8
- Thursday (9/28)
  - ME HW9



xkcd.com

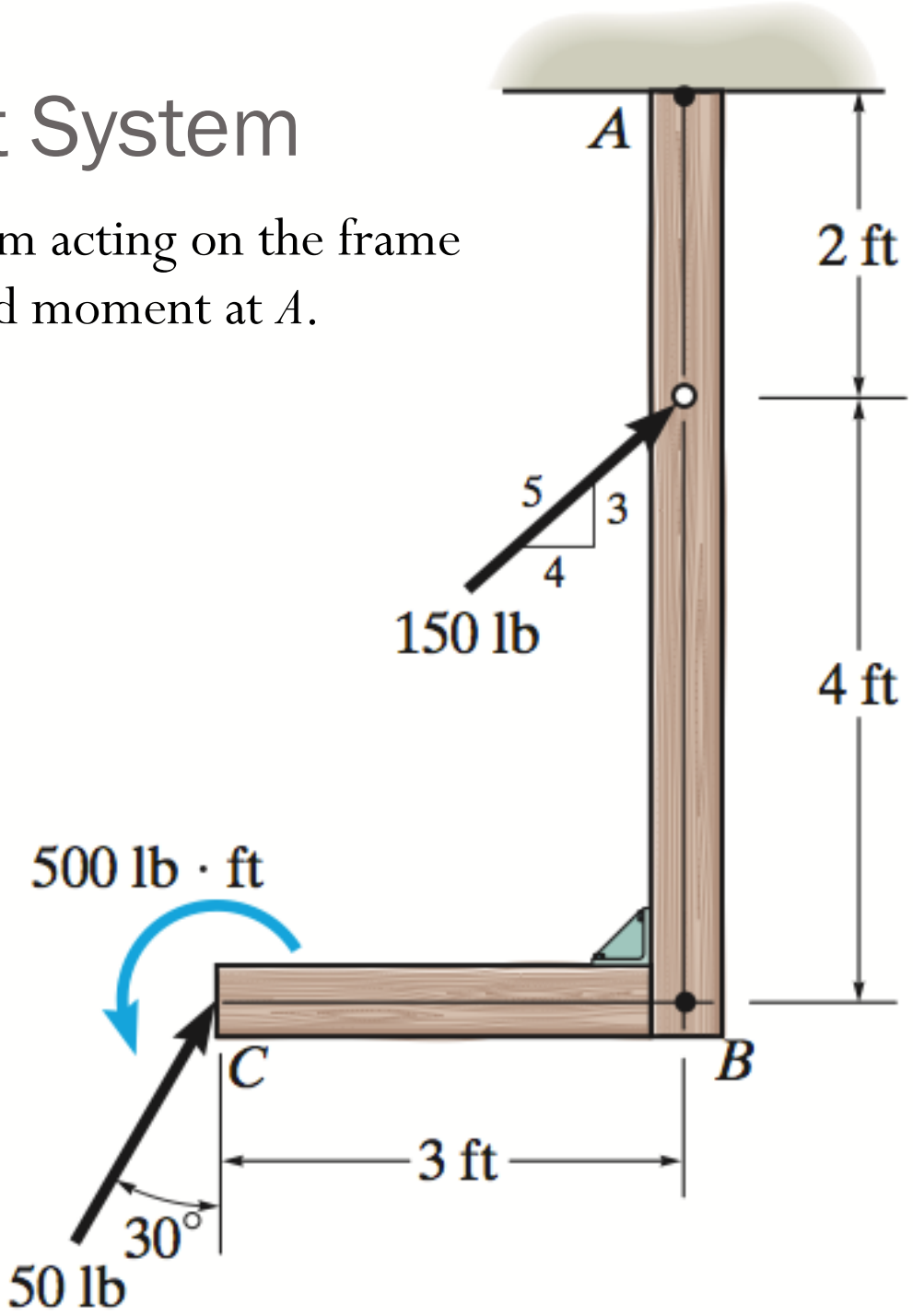
Recap

- Equivalent force systems

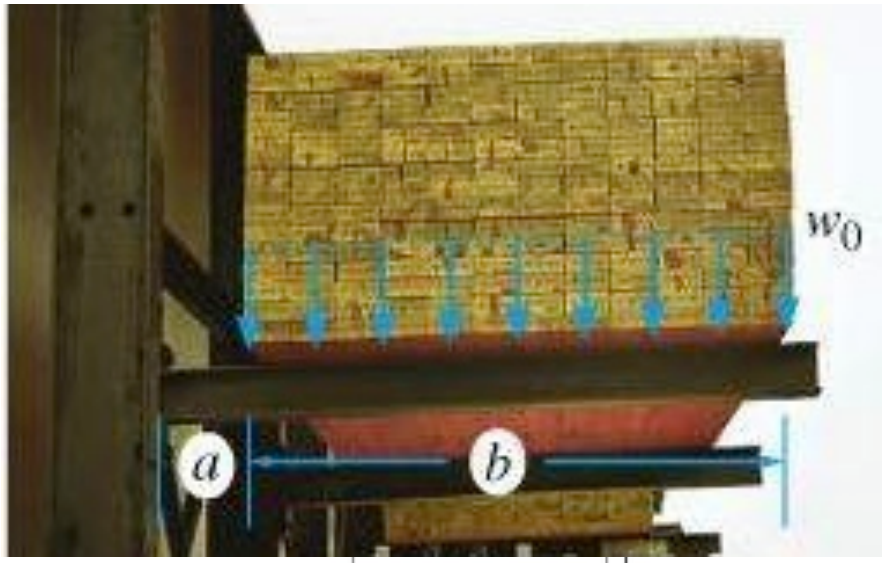


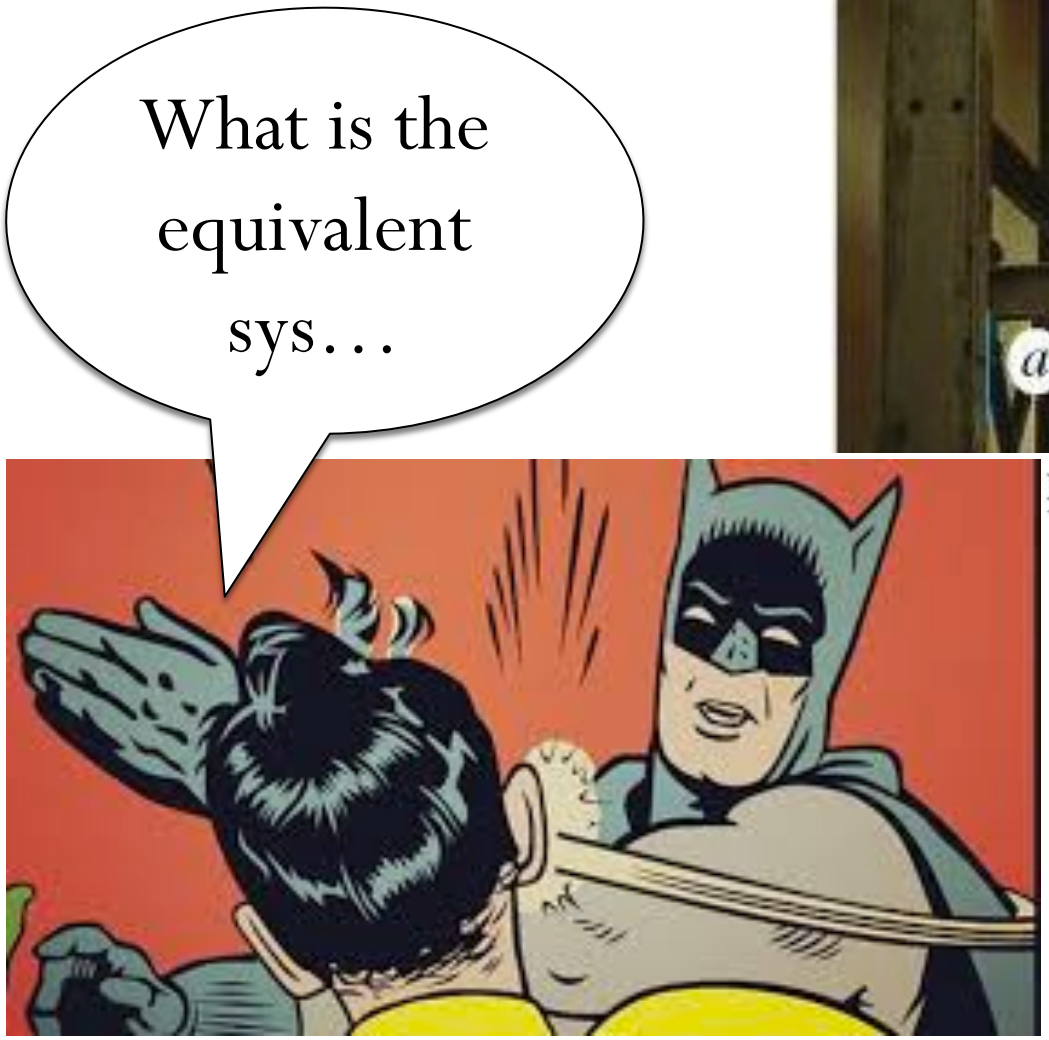
Example –Equivalent System

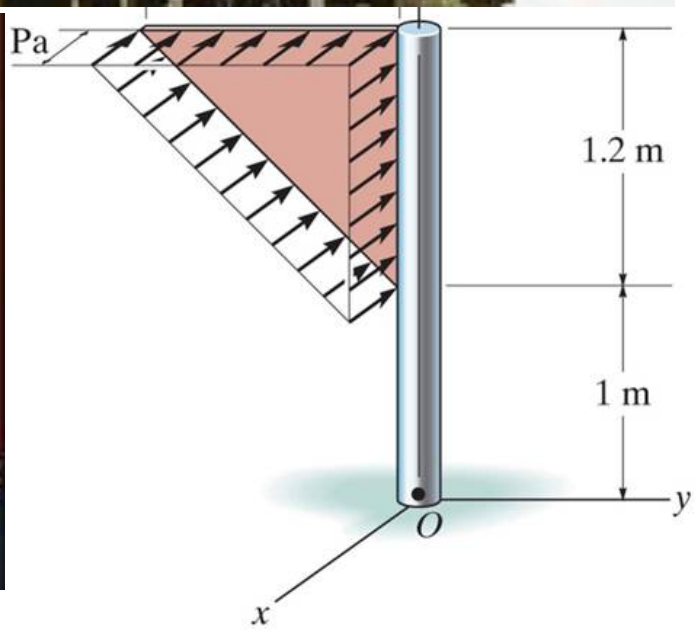
Replace the force and couple system acting on the frame by an equivalent resultant force and moment at *A*.



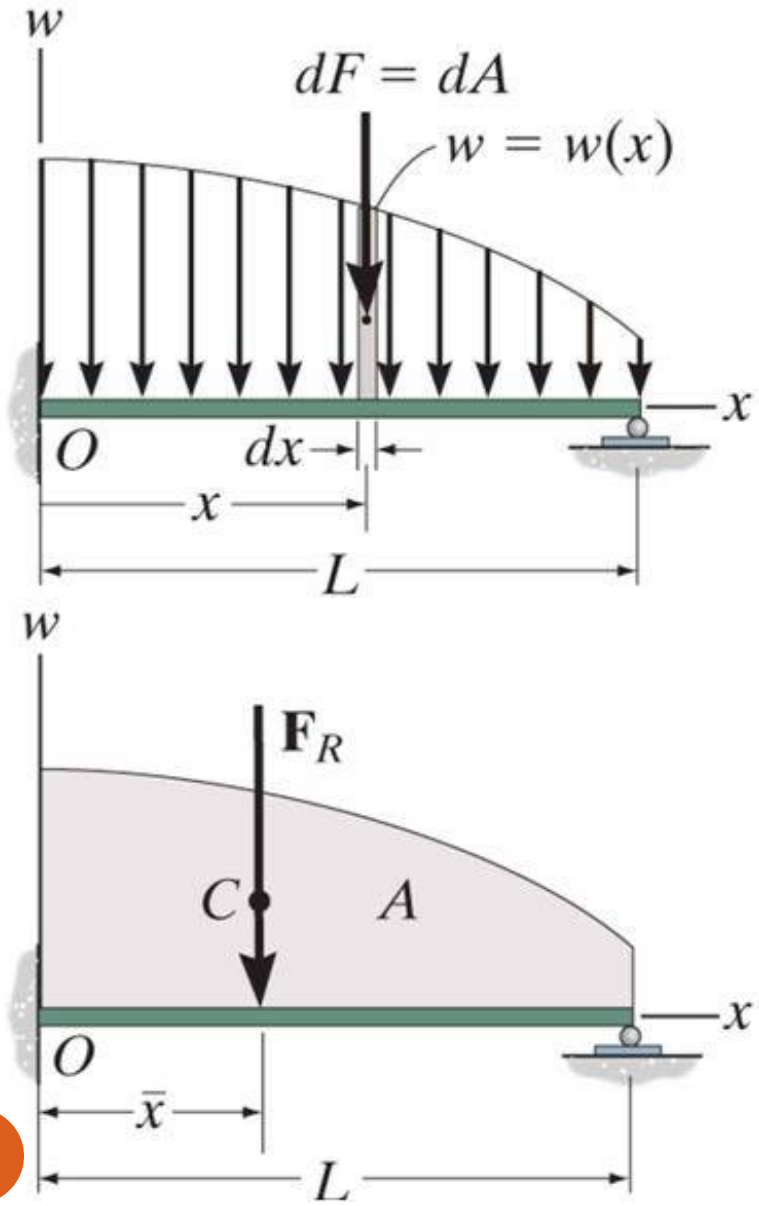
Distributed Loading







Distributed Loading



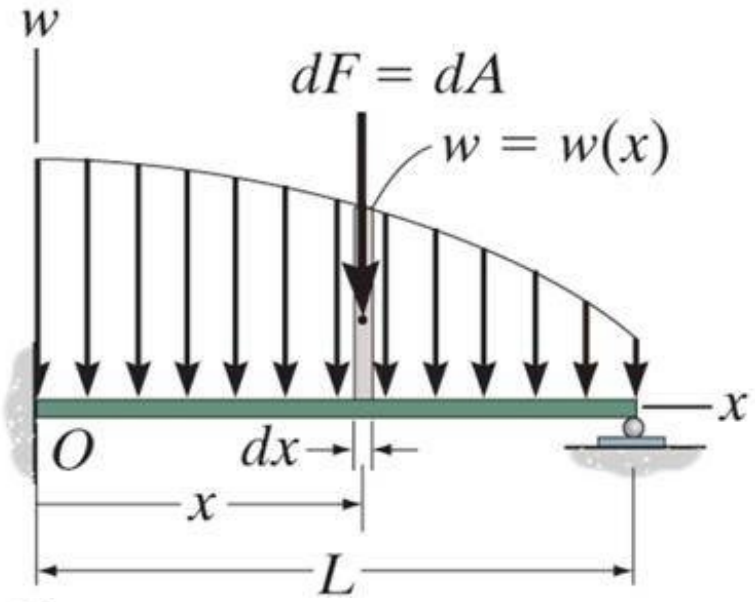
A common case of distributed loading in a uniform load along one axis of a flat rectangular body.

In such cases, w is a function of x and has units of

Consider an element of length dx. The force magnitude dF acting on it is given as

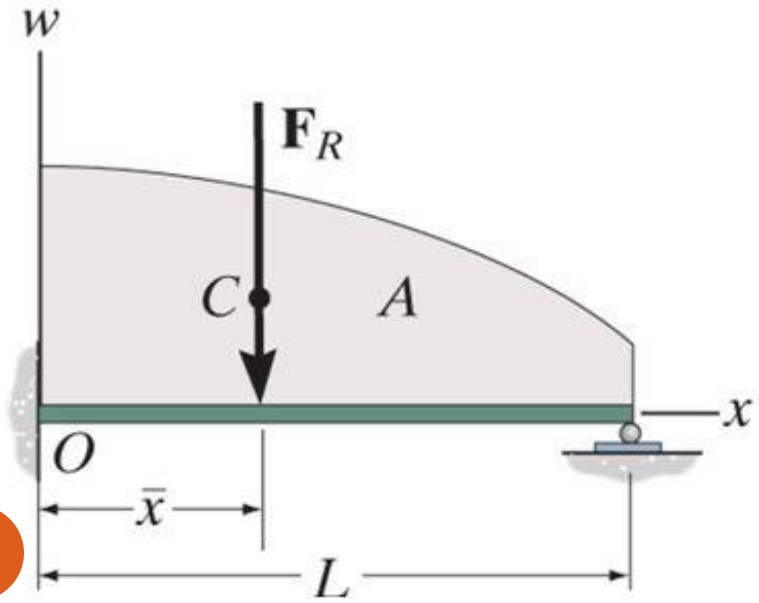
The net force on the beam is given by

Location of the Resultant Force



The force *dF* will produce a moment about *O* of

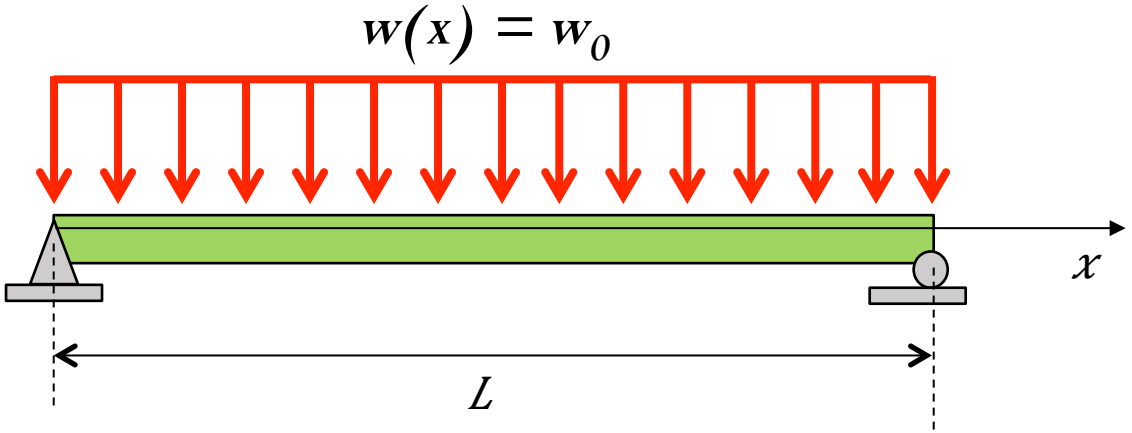
The total moment about point O is



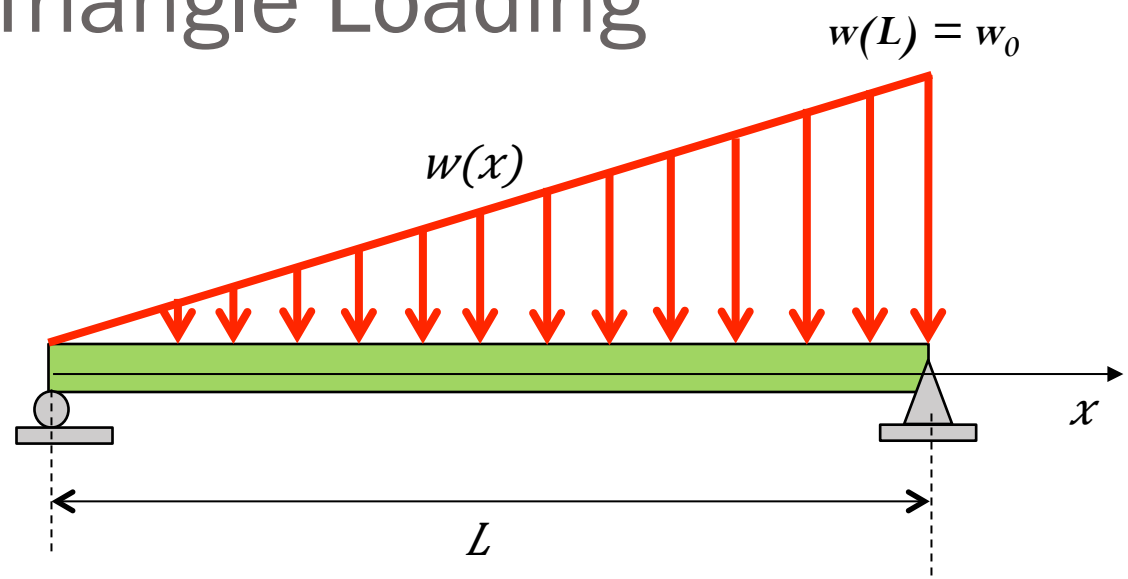
Assuming that $\mathbf{F}_R$ acts at $\underline{x}$, it will produce the moment about point *O* as

Hence,

Rectangle Loading

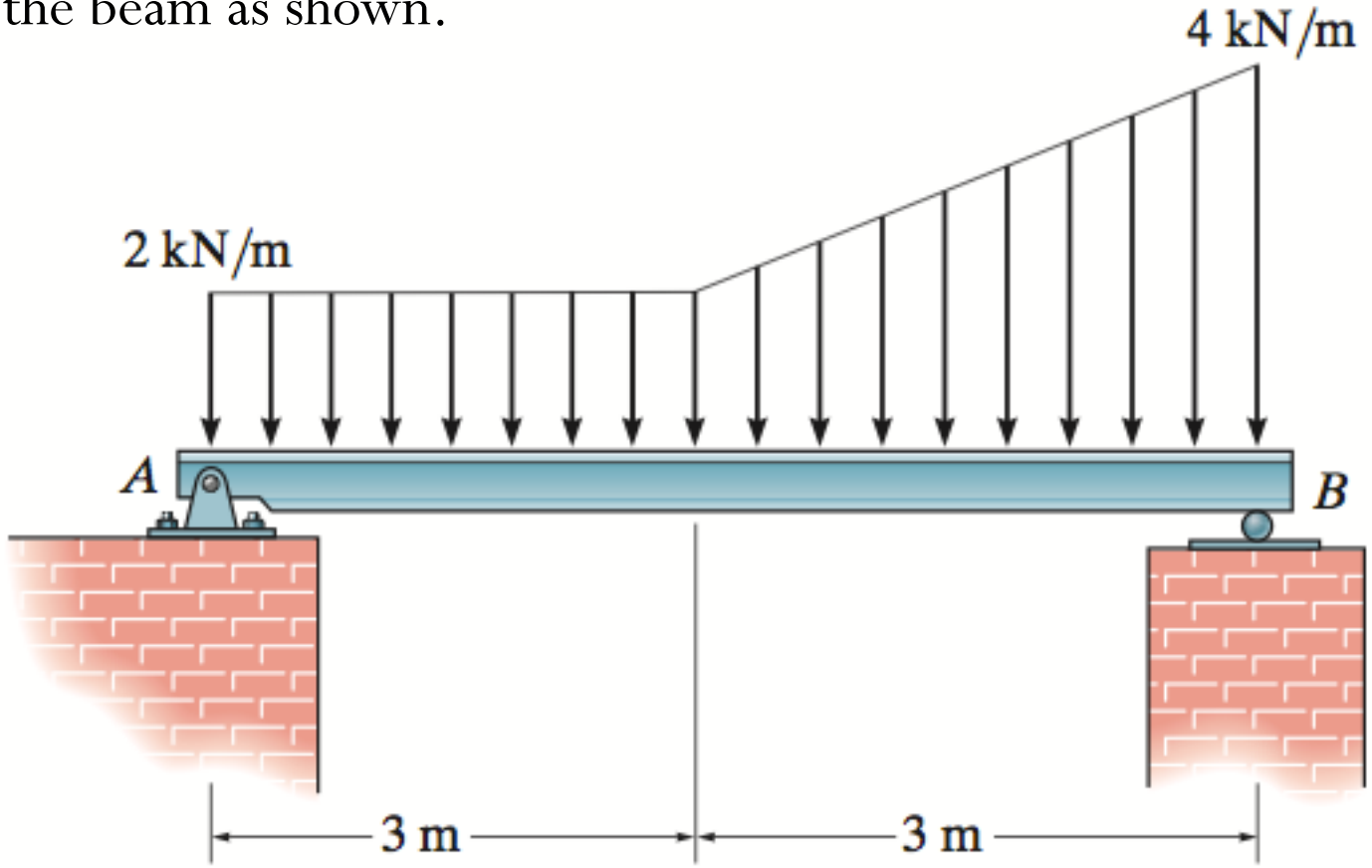


Triangle Loading



Example

Find the equivalent force and its location from point *A* for the loading on the beam as shown.



Example

Find the equivalent force and its location from point A for the loading on the beam as shown.