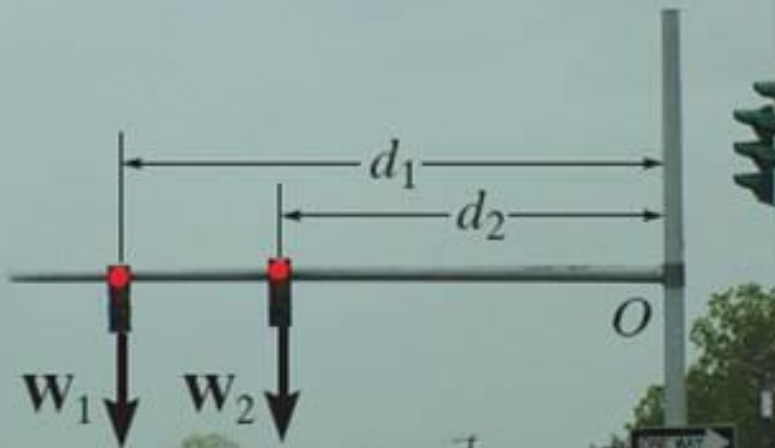
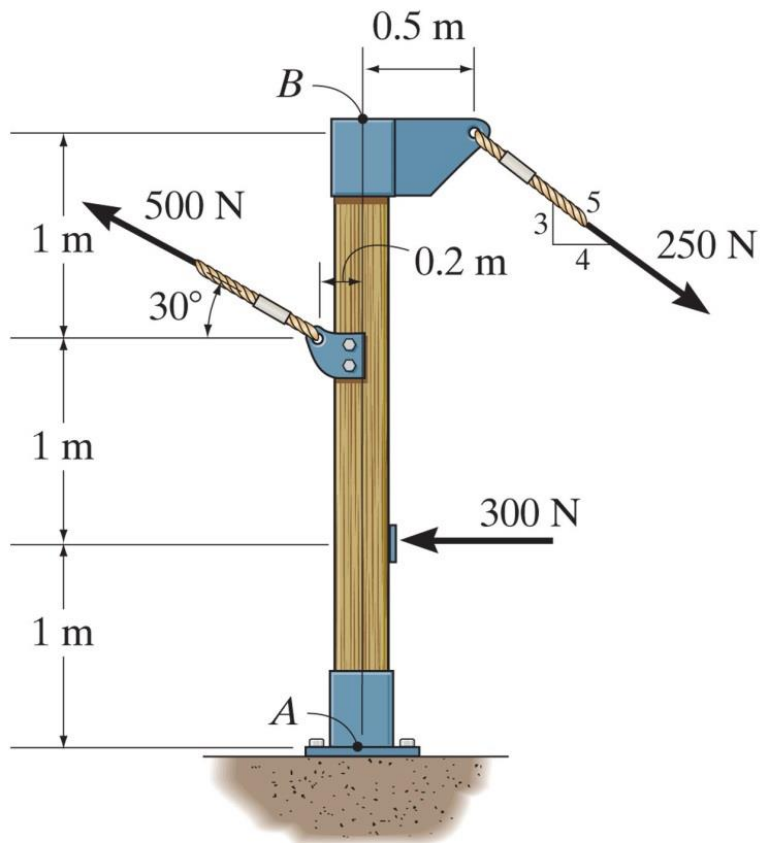


To do ...

- Quiz 2 this week (**ends on today!**)
- WA 1 **due TODAY @ 11:59 pm**
- HW 8 due **Tues**
- HW 9 due **Thurs**
- In class quiz 3 **MONDAY, Oct 2**
- **Thank you for your feedback!!**
- **Happy Autumn Equinox!!**

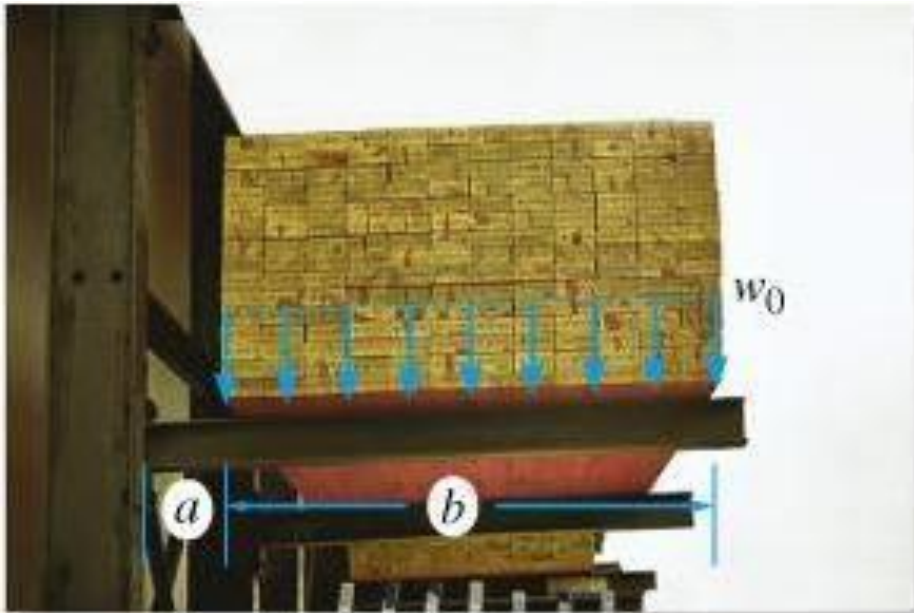
What is the equivalent system?



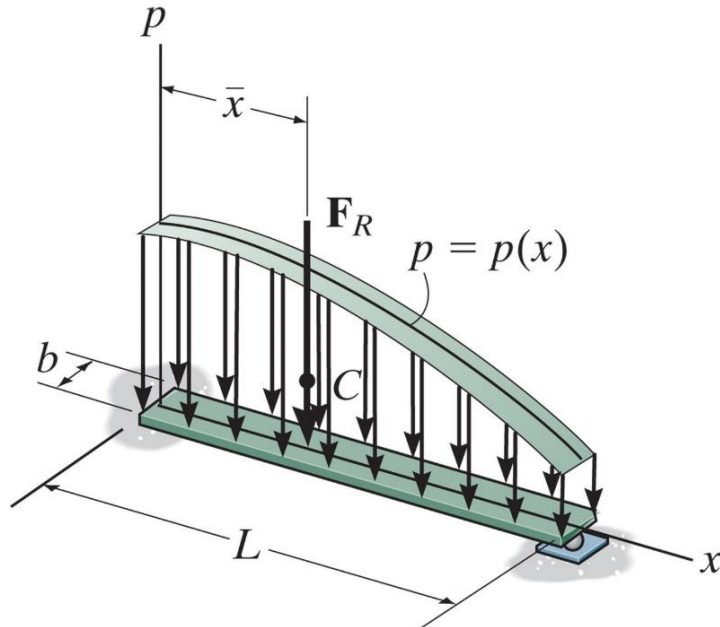


Replace the force system acting on the post by a resultant force and resultant moment about point A, and specify where its line of action intersects the post AB measured from point A.

Reduction of a simple distributed load

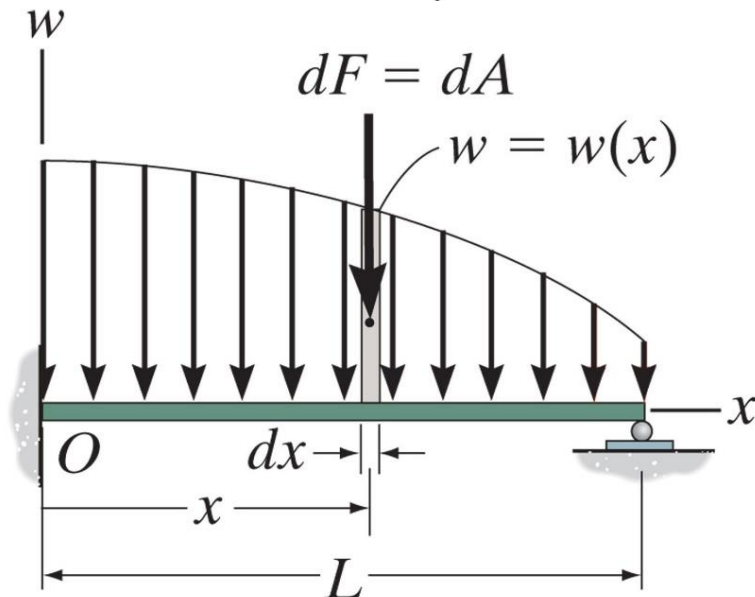


Reduction of a simple distributed load



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.



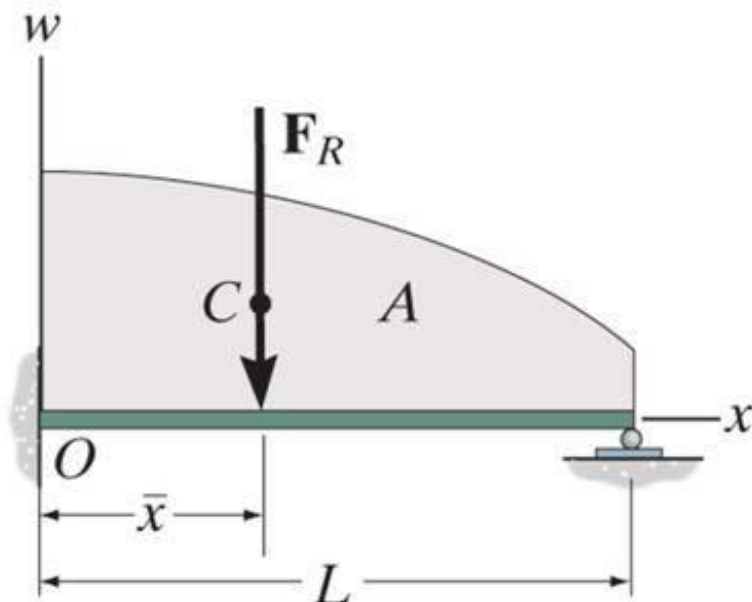
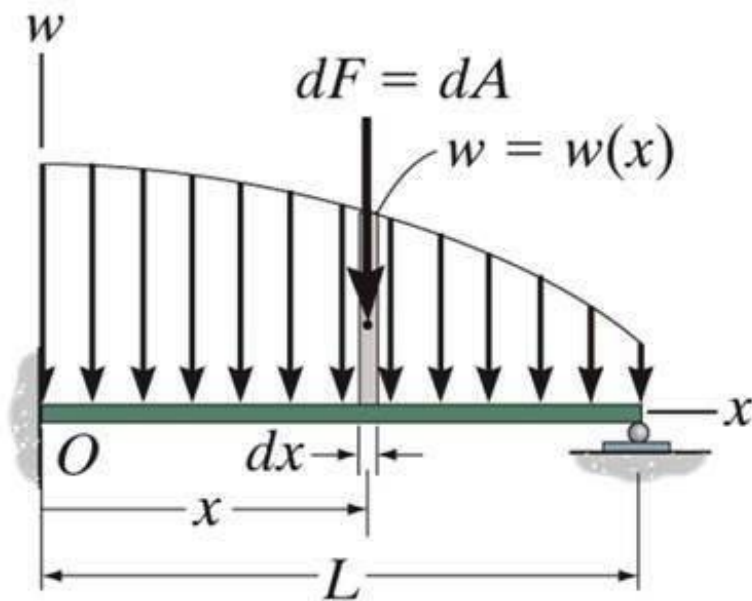
Distributed Loading

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



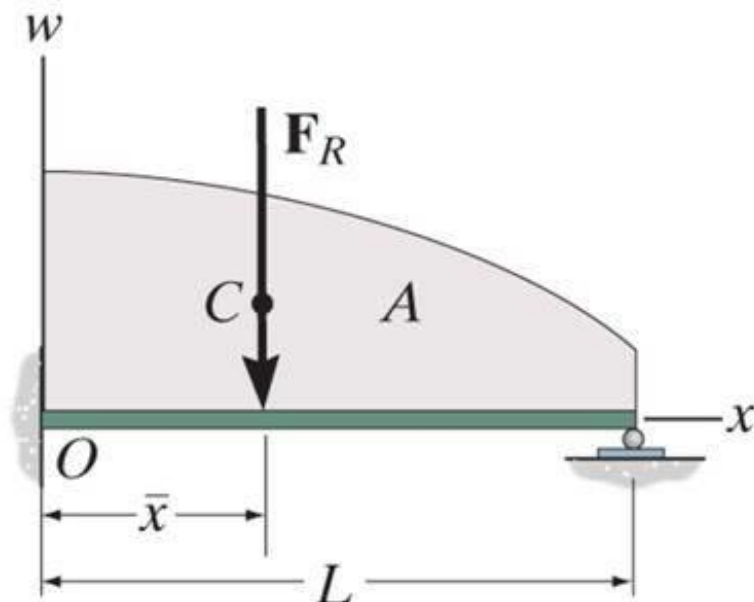
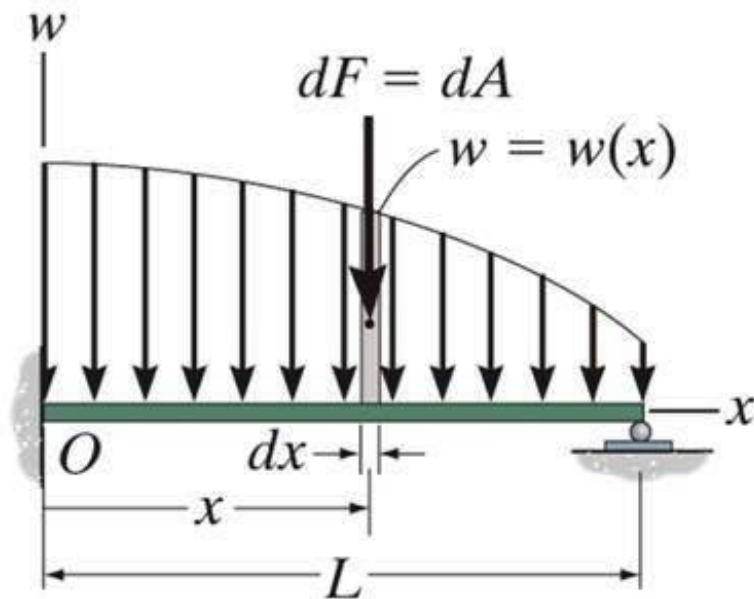
Location of the Resultant Force

The force dF will produce a moment about O of

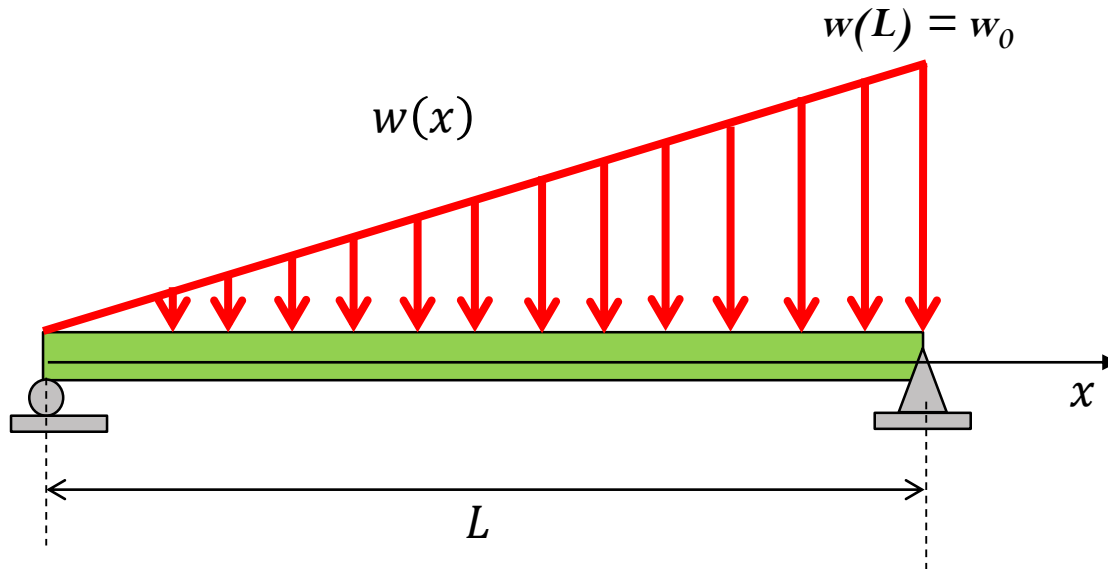
The total moment about point O is

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

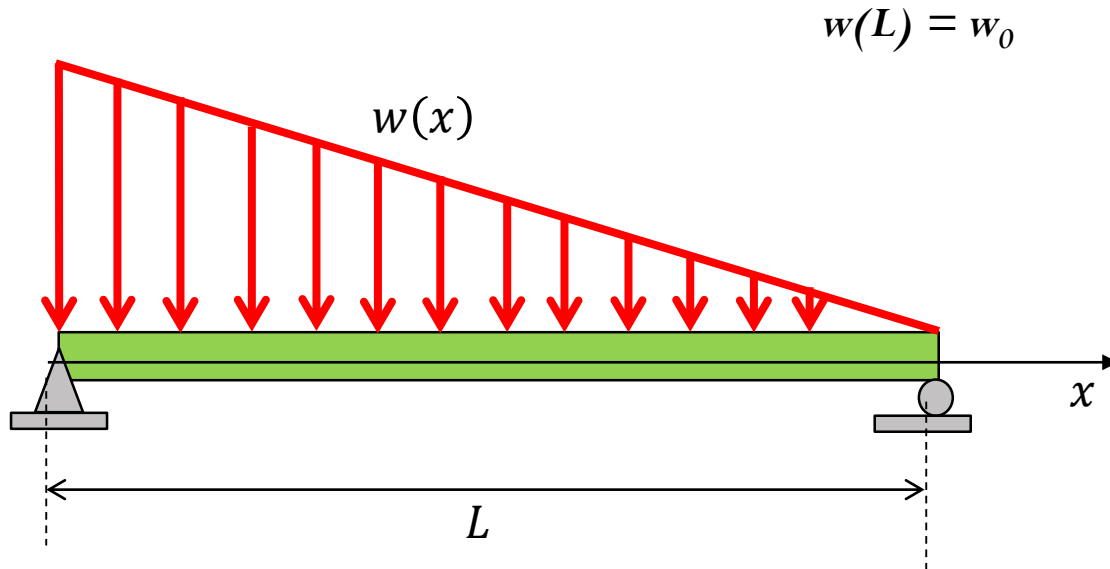
Hence,



Triangular loading

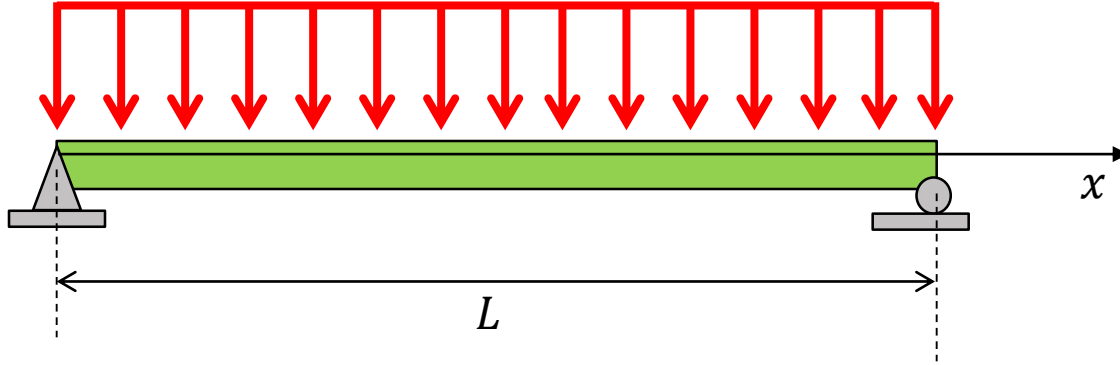


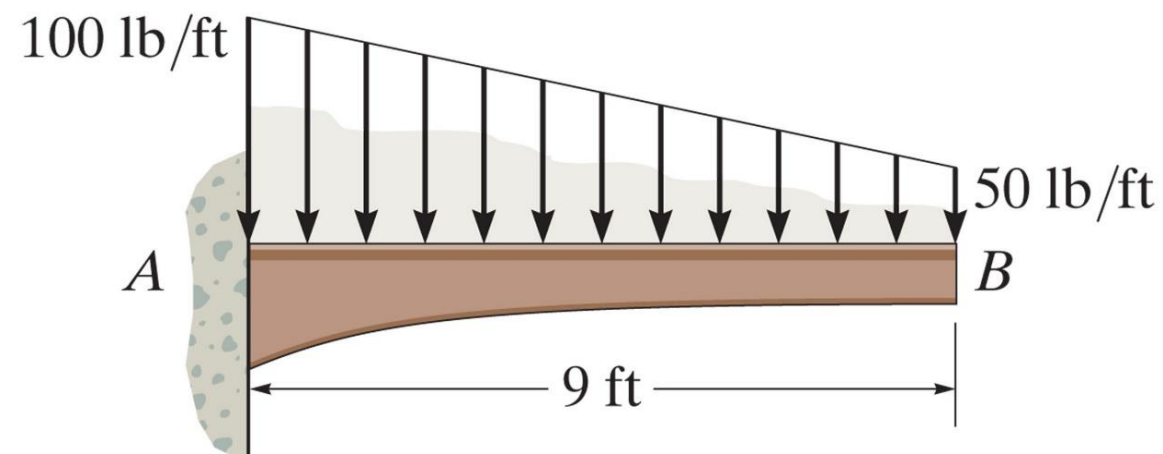
Triangular loading



Rectangular loading

$$w(x) = w_0$$





Determine the magnitude and location of the equivalent resultant of this load.

