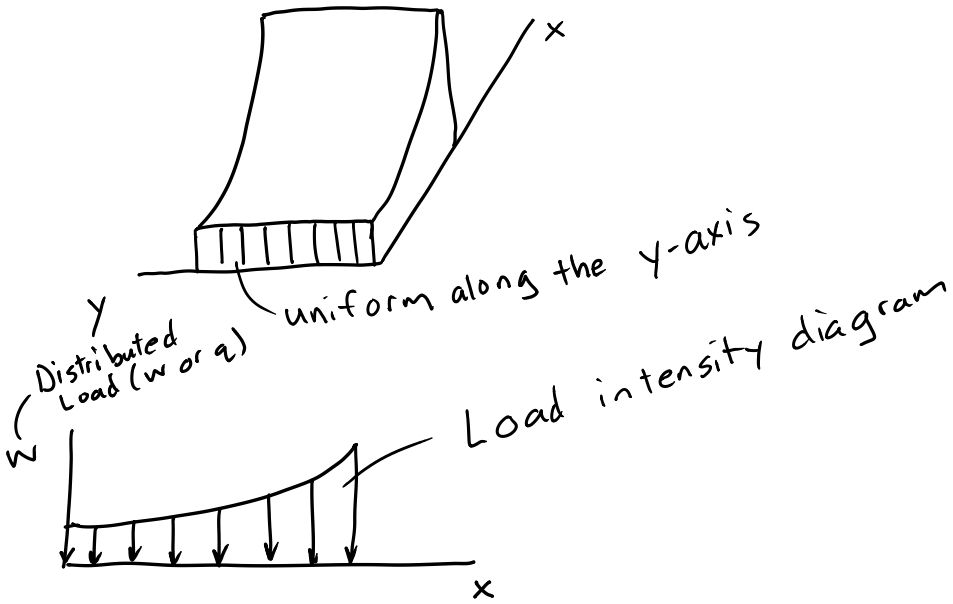
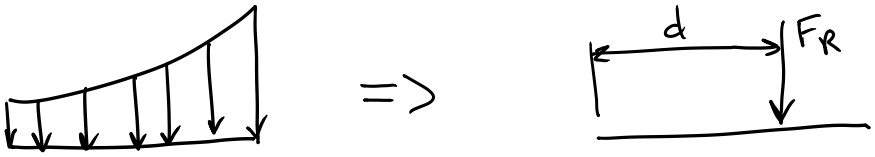
4.3) Distributed Loads

Distributed Loading
- Load is distributed over the surface of the body
- Examples: Wind, fluid, weight of a beam
- For now, the load will be assumed to be uniform along one axis



Goal



Result

F_R = Area under the load intensity diagram
d = Centroid of the load intensity diagram

$$F_R = \int_{x_1}^{x_2} w\,dx = \text{Area}$$

$$d = \bar{x} = \frac{\int_{x_1}^{x_2} x\,w\,dx}{\int_{x_1}^{x_2} w\,dx} = \text{Centroid}$$

If the geometric properties of the shape are known, then integration is not necessary.