8.4 Varying Density

- Density over length, area or volume:
  Substance mass with density varying over a volume g/cm^3
  Population quantity like people/square mile, bacteria/cc.
- Slice so density is approximately constant:
  If $\delta = f(x)$, then slice $\perp x$, for constant density slices
  mass=$\sum$density $\cdot$ length (Δx), area, or volume
  If $\delta = f(r)$, then slice from center outward, annular rings
  population=$\sum$density $\cdot$ area $\rightarrow \int_a^b 2\pi r \delta(r)\, dr$
- Key: figure out slicing variable, then $\int \delta \cdot$ length or $\int \delta \cdot$area
  or $\int \delta \cdot$volume in that variable