Thursday Reading Assessment: Unit 0, Review of 135A

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1 Memory Bank

- $\vec{p} = m\vec{v}$ ... Definition of momentum involving vectors.
- $\vec{p}_{\rm tot,i} = \vec{p}_{\rm tot,f}$ ... Conservation of momentum.

2 Warm-Up Exercises

1. Suppose a physical therapy patient is asked to shove a medicine ball forward off the edge of a table to help rebuild the strength of their shoulders. The medicine ball weighs 7 kg. (a) If the patient is able to give the ball a speed of 1 m s^{-1}, what is the momentum of the ball? (b) If the patient gives the ball the same momentum by rolling it, and it strikes elastically a ball with a mass of 3.5 kg, what will be the velocity of the second ball?

2. (a) Estimate the area of our classroom, in m^2. (b) Estimate the volume of our classroom, in m^3. (c) If 100 people entered this classroom, how much volume would each person have?

3. Perform the following unit conversions:
   - Convert 120 cm to m:
   - Convert 500 cm^2 to m^2:
   - One "atmosphere" of pressure, or 1 atm, is equal to 101325 Pascals, or Pa. A Pascal is defined as 1 N m^{-2}. Convert 610 Pa to atm. (This is roughly the air pressure on Mars).

4. Let $\vec{x} = 0.5\hat{i} - 0.5\hat{j}$, and $\vec{y} = -0.5\hat{i} + 0.5\hat{j}$. (a) Calculate $\vec{x} + \vec{y}$. (b) Calculate $\vec{x} - \vec{y}$.