

3. We take the final direction of motion to be the $+\hat{i}$ direction (when it is headed back to the pitcher) so that $\vec{v}_f = +60\hat{i}$ and $\vec{v}_i = -40\hat{i}$ in SI units. Therefore, $\Delta\vec{v} = 60 - (-40) = 100\hat{i}$ m/s. The magnitude of the average force is

$$\left|\vec{F}_{\text{avg}}\right| = \frac{|\Delta\vec{p}|}{\Delta t} = \frac{m|\Delta\vec{v}|}{\Delta t} = \frac{(0.150\text{ kg})(100\text{ m/s})}{5.0 \times 10^{-3}\text{ s}} = 3.0 \times 10^3\text{ N} .$$