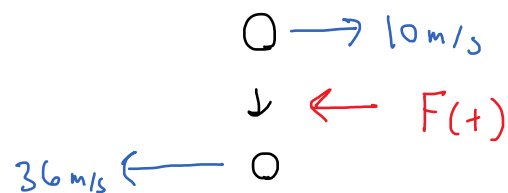


Problem 1

A tennis ball (.06 kg) is served to tennis player at a speed of 10 m/s. The player then returns the ball at a speed of 36 m/s.

- What is the impulse exerted on the ball?
- If a high speed camera reveals the impact lasted .02 seconds, what is the average force exerted on the ball during the collision?



$$J = \Delta m v = m v_f - m v_i$$

$$\Delta m v = (.06 \text{ kg})(-36 \text{ m/s}) - (.06 \text{ kg})(10 \text{ m/s})$$

$$\boxed{\Delta m v = -2.76 \frac{\text{kg} \cdot \text{m}}{\text{s}}}$$

$$J = (F)(t) = \Delta m v$$

↑
0.02 s

$$\boxed{F = -138 \text{ N}}$$