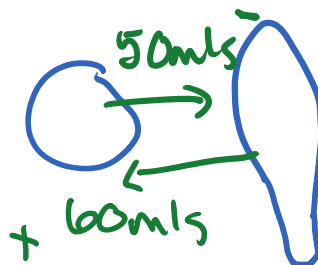# Momentum Example Problems

Thursday, November 14, 2013   9:57 AM

1. A 1 kg ball is kicked from rest to a velocity of 20 m/s in .2 seconds. What is its impulse?

$$I = F \cdot \Delta t$$

$$\Delta p = m\Delta v = F \cdot \Delta t \rightarrow N \cdot s$$

$$1 \cdot (20-0) = 20 \, kgm/s$$

2. A .5 kg ball comes in at 50 m/s and hits a bat. It leaves at 60 m/s. This collision takes .1 seconds.
   How much force is on the bat?

$$m\Delta v = F\Delta t$$

$$\frac{m\Delta v}{t} = F$$

$$\frac{.5(60-50)}{.1}$$

50m/s

+ 60m/s

$$v_i = -50 \, m/s$$
$$v_f = 60 \, m/s$$

$$F = \frac{m\Delta v}{t} = \frac{.5(60 - -50)}{.1}$$

$$= \frac{.5 \cdot 110}{.1} = 550 N$$