

Phys11 Momentum : W.S. - 40

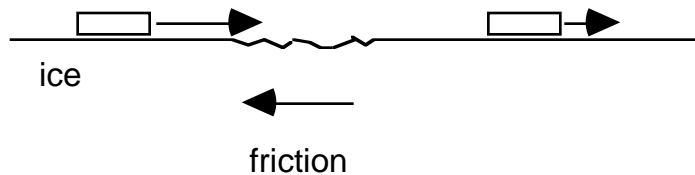
1) A pitcher throws a 0.35 kg ball (initially stationary) with a velocity of 22 m/s. The time Δt for the throw is 0.10 s.

- a) $P_{\text{initial}} = \underline{\hspace{2cm}}$ b) $P_{\text{final}} = \underline{\hspace{2cm}}$ c) $\Delta P = \underline{\hspace{2cm}}$
 d) $F \Delta t = \underline{\hspace{2cm}}$ e) $F_{\text{pitcher}} = \underline{\hspace{2cm}}$

2) A pitcher throws a 0.28 kg ball with a velocity of -18. m/s towards a batter. The batter hits the ball, giving it a velocity of +32 m/s. $\Delta t = 0.020$ seconds.

- a) $P_i = \underline{\hspace{2cm}}$ b) $P_f = \underline{\hspace{2cm}}$ c) $\Delta P = \underline{\hspace{2cm}}$
 d) Impulse = $\underline{\hspace{2cm}}$ e) $F_{\text{bat}} = \underline{\hspace{2cm}}$

3) A 0.20 kg puck moves on ice with a velocity of 15 m/s. The puck slows down because of friction. The friction force of -3.0 N acts for 0.50 seconds.



- a) $P_i = \underline{\hspace{2cm}}$ b) $F \Delta t = \underline{\hspace{2cm}}$ c) $\Delta P = \underline{\hspace{2cm}}$
 d) $P_f = \underline{\hspace{2cm}}$ e) $V_f = \underline{\hspace{2cm}}$

4) A gun with a mass of 3.2 kg fires a 4.0 gram bullet with a velocity of 510 m/s.

- a) The momentum of the bullet is $\underline{\hspace{2cm}}$.
 b) The final momentum of the gun is $\underline{\hspace{2cm}}$.
 c) Find the initial recoil velocity of the gun. $\underline{\hspace{2cm}}$.

Answers : 1)a) 0.0 kg m/s, b) 7.7 kg m/s, c) 7.7 kg m/s, d) 7.7 N-s, e) 77 N, 2)a) -5.0 kg m/s, b) +9.0 kg m/s, c) +14 kg m/s, d) +14 N-s, e)

7.0x10² N, 3)a) 3.0 kg m/s, b) -1.5 N-s, c) -1.5 kg m/s, d) 1.5 kg m/s,
e) 7.5 m/s, 4)a) 2.0 kg m/s, b) -2.0 kg m/s, c) -0.64 m/s.