Momentum Review Problems

Warmup Question

1. The whoosh bottle has a mass of 0.8 kg and is filled with 0.008 kg of methyl alcohol vapor. When the vapor explodes, it exits the bottle backward at a speed of 180 m/s. What is the speed of the bottle after it launches?

Optional Practice Problems

2. A 4-kg bowling ball rolling to the right at 8 m/s has a head-on collision with a 6-kg ball initially at rest. After the collision, the 4-kg ball moves to the right with a velocity of 2 m/s. What is the velocity of the 6-kg ball after the collision?

3. A 55-kg pole vaulter falls onto a foam-rubber pad. The pole vaulter comes to rest 0.3!sec after landing on the pad. If the stopping force applied by the pad is 1815 N, what is the athlete's velocity just before reaching the pad?

4. A 55-kg girl is on a boat ($m = 100$ kg) that is at rest. The girl jumps off the boat with a velocity of 1.5 m/s. What is the velocity of the boat after she jumps?

5. A 1550-kg car moving **south** at 10 m/s collides with a 2550-kg truck moving **north**. The car and truck stick together and move as a unit at a speed of 5.22 m/s **north**. Find the velocity of the truck before the collision.

Check your answers

2. 4.0 m/s
3. -9.9 m/s
4. 0.825 m/s
5. 14.5 m/s