



Additional Problems - Impulse & Momentum

1. A gun is fired vertically into a 3.40 Kg block of wood directly above it. The bullet has a mass of 62.0 g and a speed of 340 m/s. How high will the block rise into the air?
2. A 15 000 Kg railroad car travels alone on a level frictionless track with a constant speed of 30 m/s. A 50000 Kg additional load is dropped onto the car. What will be its new speed?
3. A 4200 Kg rocket is traveling in outer space with a velocity of 150 m/s toward the sun. It wishes to alter its course by 30° and can do so by shooting its rockets briefly in a direction perpendicular to its motion. If the rocket gases are expelled at a speed of 2700 m/s, what mass of gas must be expelled?
4. An atomic nucleus at rest decays radioactively into an alpha particle and a smaller nucleus. What will be the speed of this recoiling nucleus if the speed of the alpha particle is 6.2×10^5 m/s? Assume the nucleus has a mass 57 times greater than that of the alpha particle.