**MOMENTUM MOCK TEST!** Remember to look at the website under “G Solutions” for the appropriate sample problems for each page! Here are some practice problems for additional help:

1. **Two 400 g blocks of wood are at rest on that by now familiar frictionless surface. A 78 g bullet initially going 890 m/s goes through both blocks. Following this, the first block is moving 7 m/s, and the second 4 m/s. Neither the bullet nor the blocks lose any pieces.**

* 1. **What is the velocity of the bullet after going through both blocks?**
  2. **What was the bullet’s velocity between the blocks?**
  3. **How much kinetic energy did the bullet have before entering the first block? How much kinetic energy did it have after it went through the first block?(mass in kg)**
  4. **If the bullet exerted 5150 N on the first block, how long did the bullet take to go through it?**

A=834 m/s B=854 m/s C=30,892 J, 28,443 J D=0.00054 s

1. **A rocket has a total mass of 20 kg. The mass of the actual rocket itself is 8.0 kg. It consumes the fuel in 4.7 seconds, generating 1290 N of thrust as it takes off from EARTH vertically upward.**
   1. **What is mass of the fuel? What’s the burn rate?**
   2. **What is the velocity of the exhaust gasses leaving the engine?**
   3. **What are the initial and final accelerations of the rocket? (Just like I&M, don’t forget gravity)**
   4. **If the rocket burned the same fuel in the same time, but the exhaust velocity changed to 1778 m/s, what is the thrust force of the engine?**

A=12 kg, 2.55 kg/s B=506 m/s C=54.7 m/s2, 151 m/s2 D=4539 N

**You should also spend time looking at questions like Thor and Priscilla on the carts….because I see *someone* in the distance on some carts, preparing to jump….could it be……is it *really him*????????**

**6. Momentum and Impulse**

A. What speed does a 0.145 kg baseball have if it has 5.8 kg m/s of momentum? (40. m/s)

B. If you exert 1.2 N on a 0.347 kg air track glider for 3.2 seconds, what is its change in velocity if there is no friction? (11.1 m/s)

C. A 4.50 g bullet going 415 m/s is going 312 m/s after passing cleanly through a 670 g block of wood that is initially at rest. What is the velocity of the block of wood just after this? (0.692 m/s)