Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Physics 11

**Worksheet 2.6**

**“The Big Three”**

1. A ball rolling down a hill was displaced 19.6 m while uniformly accelerating from rest. If the final velocity was 5 m/s, what was the acceleration?
2. A car starts from rest and accelerates uniformly to reach a speed of 21 m/s in 7 s. What is the speed of the car after 2 seconds?
3. A bike rider accelerates uniformly at 2 m/s2 for 10 s. If the rider starts from rest, calculate the distance traveled in the fourth second (i.e. between t=3 and t=4).
4. If a bullet leaves the barrel of a rifle at 600 m/s and the barrel is 90 cm long, what is the acceleration of the bullet while in the barrel?
5. The Jamaican bobsled team hits the brakes on their sled so that it decelerates at a uniform rate of 0.43 m/s2. How long does it take to stop if it travels 85 m before coming to rest?
6. The driver of a car going 90 km/h suddenly sees the lights of a barrier 40 m ahead. It takes 0.75 s before the driver applies the brakes (this is his “reaction time”). Once he does begin to brake, he decelerates at a rate of 10 m/s2.
   1. Does he hit the barrier?
   2. BONUS: What would be the maximum speed at which the car could have been traveling and NOT hit the barrier?

Answers: 1) 0.638 m/s2 downhill 2) 6.0 m/s 3) 7 m 4) 200,000 m/s2 5) 19.88 s  
6a) Yes, he would need 50 m in order to stop but he only has 40 m. 6b) 78 km/h