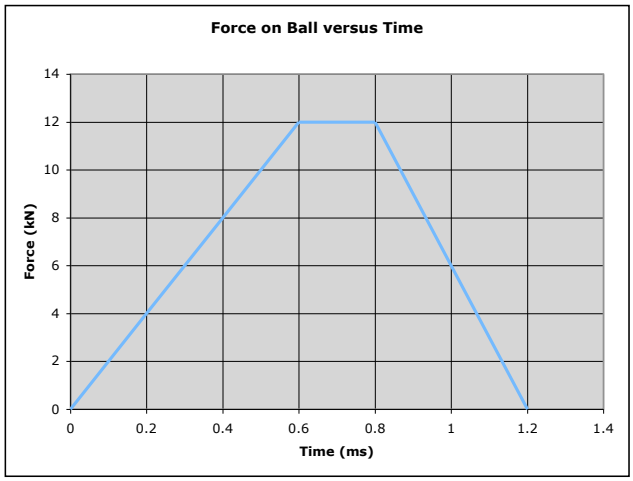
1. Check out this video (http://www.youtube.com/watch?v=vKpSbk8B9ok) of an airbag deploying during a crash. Suppose the mass of the driver's head is 3.00kg, the car is traveling 25.0m/s, and the drivers head comes to rest in 0.120s. For the driver's head, find (a)the initial momentum, (b)the final momentum, (c)the change in momentum, and (d)the average force exerted by the bag. Suppose there were no airbag and the driver's head was stopped by the steering wheel in 0.0100s, (e)find the force exerted by the steering wheel. Why do you want to have a working airbag?

2. The force exerted on a baseball by a bat as a function of time is shown in the graph at the right. Find the impulse exerted during the collision (a)on the baseball and (b)on the bat. Find the change in momentum of (c)the baseball and (d)the bat.



3. A 75.0kg football player (#56) moving eastward at 5.00m/s when he collides with and holds on to an 80.0kg ball carrier (#22) running northward at 4.00m/s. Together they move at 3.89m/s just after the collision. This is not enough information to answer the simple question, "What is the force that #56 exerts on #22?" (a)What additional information do you need? (b)Even if you can't find the force the #56 exerts on #22, what can you say about the force the #22 exerts on #56? (c)What does this tell you about the total momentum of #56 and #22?

4. I saw the sketch below in the newspaper a while back. The author of the associated article explained the benefits of using cable barriers instead of concrete on highways in simple terms. Now, you need to explain the same thing using the principles of physics.