**The National Orthodox School /Shmaisani**

**Subject: Physics Title: Collision HW**

**Name: Mark: \_\_\_/10**

1. A bullet of mass 0.1 kg traveling horizontally at a speed of 300 m/s embeds itself in a block of mass 3.5 kg that is sitting at rest on a nearly frictionless surface.
   1. What is the speed of the block after the bullet embeds itself in the block?
   2. Calculate the kinetic energy of the bullet and the block before the collision.
   3. Calculate the kinetic energy of the bullet and the block after the collision.
   4. Was this collision elastic or inelastic? Explain your answer.
2. A 4500.0 kg pickup truck is moving at 15.0 m/s. A 2500.0 kg Tesla Model X is sitting at rest at a stop sign. The pickup truck collides with the Tesla and the cars DO NOT stick together. After the collision, the Tesla is moving at 12.0 m/s.
   1. What is the final velocity of the truck?
   2. What is the total initial kinetic energy of the two-car system?
   3. What is the total final kinetic energy of the two-car system?
   4. What type of collision is this? Explain your answer.