

Handed Out: _____
Due: _____

Name: _____
Date: _____

Momentum Problems 2

Physical Science and Technology

Use the five steps for each of these problems except where indicated.

1. A 500kg object moving at 8 m/s strikes a 200 kg object (which is standing still) and stops. As a result of the collision, the 200 kg object starts moving.
 - a. What is the 500 kg object's momentum before the collision?
 - b. What is the 200 kg object's momentum after the collision (you do not need to use the five steps for this!)?
 - c. What is the 200 kg object's velocity after the collision?

2. A green gorilla is swinging on a rope. He has a mass of 86 kg. At the very bottom of his swing he hits Tarzan, who is standing still. The green gorilla comes to a complete stop and Tarzan goes flying as a result of the collision. At the moment of the collision, the green gorilla's velocity was 11.92 m/s. Tarzan's mass is 61 kg.
 - a. What is the green gorilla's momentum before the collision?
 - b. What is Tarzan's momentum after the collision (you do not need to use the five steps for this!)?
 - c. What is Tarzan's velocity after the collision?

3. Brittney Spears is driving an automobile at 15.8 m/s. She sees a cute bunny rabbit standing still on the road and adeptly swerves so that she hits it straight on. The total momentum of Brittney and her automobile is 1,700 kg m/s. After the collision, Brittney's automobile comes to a complete stop. As a result of the collision, the rabbit takes a brief trip at 98.7 m/s (the rabbit lands on its feet, uninjured).
 - a. What is the rabbit's momentum after the collision (you do not need to use the five steps for this!)?
 - b. What is the mass of the rabbit?

4. In problem #3 above, what is the combined mass of Brittney and her automobile?

5. Peyton Manning is barreling down a football field at 2.4 m/s. He has a mass of 87 kg. Igor Olshansky, with a mass of 52.9 kg, is running straight towards him. How fast will Igor have to run in order to bring Peyton to a complete stop when they collide? (Hint - to get him to stop, Igor Olshansky will have to have the exact same momentum as Peyton Manning)