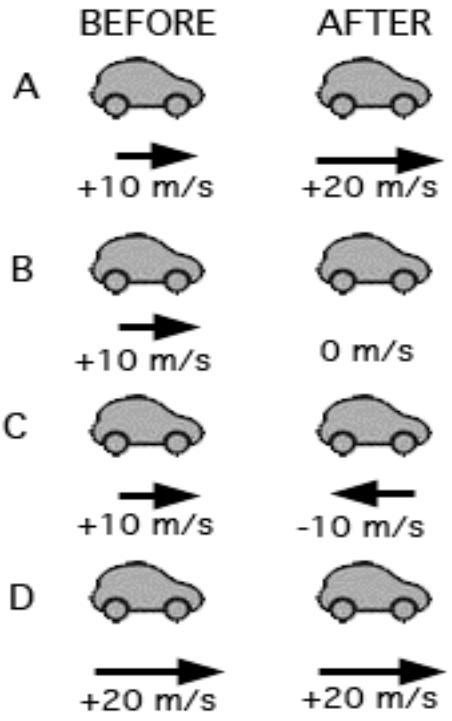
Name:_____

Solve the following problems in the space provided. Use the back of the page if needed. Each problem is worth 20 points. You must show your work in a logical fashion starting with the correctly applied physical principles. The equations you need are on the equation sheet. Your score will be maximized if your work is easy to follow because partial credit will be awarded.

1. The four situations to the right show before and after "snapshots" of a car's velocity. Rank these situations, in terms of the impulse on the car required to create these changes in velocity, from most positive to most negative, All cars have the same mass. Explain your reasoning for full credit.



2. A nickel (m = 5.00g) slides along a smooth counter at 3.00m/s and collides head-on with a quarter (m = 5.67g) originally at rest. The speed of the quarter just after the collision is 2.75m/s. (a)Find the speed of the nickel just after the collision and (b)determine if the collision is elastic.

3. A CD player consists of a rotating palate with a rotational inertia of $1800 g \cdot cm^2$ that spins at 100rpm. A CD, which can be treated as a 50.0g disk of radius 5.00cm, is dropped on to the center of this palate. Find the rotation rate of the palate and CD just after it lands.

4. A 150g meterstick is pivoted at one end. It is initially held horizontally and released from rest. Find the speed of the tip of the meterstick when it reaches the vertical.

5. A 5.00g straw is just long enough to rest across the glass as shown. Assume the top of the glass is smooth. (a)Show the forces that act on the straw. Find (b)the weight of the straw and (c)the force exerted on the straw by the top of the cup.