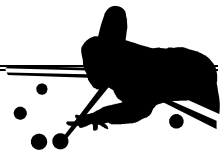
NAME PERIOD DATE



# *MOMENTUM REVIEW PROBLEMS*

1. A 6110-kg bus traveling at 20.0 m/s can be stopped in 24.0 s by gently applying the brakes. If the driver slams on the brakes, the bus stops in 3.90 s. What is the average force exerted on the bus in both these stops?

2. A force of 200. N acts on a 7.20-kg bowling ball for 0.350 s. Calculate its change in velocity.

*3.* You kick a stationary soccer ball ($F_g$ = 8.00 N) with a force of 150 N. If your foot is in contact with the ball for 7.00 x $10^{-2}$ s, what is the final velocity of the ball? *( hint: $F_g = mg$ )*

4. A force of 6.00 N acts on a 3.00 kg object for 10.0 s:
   a) what is the object's change in momentum?

   b) what is its change in velocity?

5. A car traveling at 80 km/hr runs into a truck traveling in the opposite direction at 40 km/hr. The truck weighs 3 times as much as the car. Assuming they couple together, how fast are they moving after the collision?

6. If a huge truck and a motorcycle have a head-on collision, which vehicle will experience…
   The greater force of impact?

   The greater impulse?

   The greater change in momentum?

   The greater acceleration and, hence the greater damage?

7. A 2-kg body moving at 5 m/s due north collides with a 2-kg body moving at 5 m/s due east. Assuming they couple together, what is their combined momentum?

8. A 10,000 kg railroad car traveling at 24.0 m/s strikes an identical car at rest. If the cars lock together, what is their common velocity afterward?

9. Ball A (m = 7.10 kg) rolling across a frictionless surface at a velocity of 6.05 m/s, has a head-on collision with ball B (m = 15.3 kg) initially at rest. After the collision, ball B has a velocity of 4.00 m/s. What is the final velocity of ball A?