Name:

Date:

Final Review: Impulse Momentum and Thermodynamics

You must show your work and box your answers for the following problems.

1. A bouncy ball (1.2-kg) is thrown down with an initial velocity of 12 m/s. If the ball rebounds up with a velocity of 7 m/s, what was the impulse of the collision? (Hint: sketch a diagram of the action)
2. Ima and Youra are at the roller skate rink. Ima (58-kg) travels towards the stationary Youra (62-kg) at 2.1 m/s. If the two collide and move off together, what will be the pair’s final velocity?
3. A marble (0.25-kg) rolls at a rate of 3 m/s. The marble collides with a stationary Lego (0.5-kg). If the marble bounces off and rolls with a velocity of -1.5 m/s, at what velocity with the Lego start to move?

Matching.

1. After being excused from class to “get water”, you text and walk down the hallway. Unfortunately, not watching where you are walking, you slam straight into the wall. You will experience a \_\_\_\_\_\_\_ change in momentum as compared to the wall?
   1. lesser
   2. equal
   3. greater
2. Sherlock (80-kg) and Watson (75-kg) are both running at the same velocity. Which man has the greater momentum?
   1. Sherlock
   2. Watson
   3. They have the same momentum
3. While riding a bicycle, your mother insists that you wear a helmet. Which selection best states why?
   1. Wearing a helmet will lessen your impulse, if you crash.
   2. Wearing a helmet will lessen your change in momentum, if you crash.
   3. Wearing a helmet will lessen your force by increasing the time of impact, if you crash.
   4. Yo mama secretly wants you to have helmet hair.
4. While baking cookies for your beau/belle, you accidently forget to use pot holders to remove the cookie sheet from the oven. You burn your hands because heat was transferred through \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
   1. Convection
   2. Conduction
   3. Radiation
   4. Energy
5. Which is an example of increasing entropy?
   1. Organizing your closet by the color spectrum.
   2. Alphabetizing your bookshelf.
   3. Sweeping up crumbs into a pile.
   4. Throwing your school papers in the air and watching them fall as will.
6. Which statement is false?
   1. Heat will always flow from cold to hot.
   2. Absolute zero, 0 K, cannot be reached.
   3. Ice melts into water because heat will always transfer until thermal equilibrium occurs.
   4. Energy cannot be created nor destroyed.
7. A copper wire and its rubber casing are both at the same temperature. Why does the copper feel colder than the rubber?
   1. Metal is colder than rubber
   2. Copper has a higher specific heat capacity than rubber.
   3. Rubber is a better insulator, while copper a better conductor.
8. Which statement is false?
   1. The SI unit for mass is the kg.
   2. The SI unit for temperature is Celsius.
   3. The SI unit for work is the J.
   4. The SI unit for momentum is the kg•m/s