18 Week Study Guide Chapter 3, 4, 5 and 7

Be able to define the following:

Force Friction Inertia Kilogram Law of Inertia

Mass Newton Newton’s first Law Inversely

Net Force Newton’s Second Law Normal Force Action Force

Reaction Force Newton’s Third Law Reaction Force

Conserved Elastic Collision Impulse Inelastic Collision

Law of Conservation of Momentum Momentum

Understand and be able to apply:

Newton’s First Law

Newton’s Second Law

Newton’s Third Law

Law of Conservation of Momentum

Review the following:

Newton’s Laws Test

Momentum Quiz

Newton’s Laws Notes

Momentum Notes

Example Questions:

1. A certain force gives a body an acceleration of 4 m/s2. If the force were tripled and the mass stayed the same, what would happen to the acceleration?
2. A certain force gives a body an acceleration of 4 m/s2. If the mass were somehow doubled while the force remained the same, what would happen to the acceleration?
3. A truck speeding down the road collides with a stationary car. Which has the greater force acting on it? Which undergoes the greater change in momentum? Which undergoes the greater acceleration?
4. A bowling ball is rolling down the frictionless hallway which is 100 m long. If it is initially moving at 5 m/s, how fast is it moving at the end of the hallway?
5. How is the inertia of an object found? How is momentum found? Which has more inertia, a 100 kg man standing at rest or a 50 kg boy moving at 3 m/s? Which has more momentum?
6. A 500 kg car is rolling down the street at 10 m/s when it hits a stationary 700 kg car at rest. The cars stick together and move down the street. After the inelastic collision, what is the momentum of the 2 cars that have stuck together? Are the cars moving faster, slower or the same speed as the original 1 car?
7. What makes a collision elastic? What makes it inelastic? Is there any collision that is perfectly elastic?
8. A golfer applies a force of 1000 Newtons to a 1 kg golf ball. If the ball leaves the club at 45 m/s, how long was the club in contact with the ball?
9. How much Impulse is needed to stop a 50 kg person running down the hallway at 4 m/s? If it takes .5 seconds to stop him, how much force is needed?
10. A astronaut in outer space has a mass of 150 kg. If he throws a 15 kg ball at 20 m/s, what happens to the astronaut? Will either of them either come to rest? Why or why not?