Newton’s 2nd Law HW

1. How much force is needed to accelerate a 66 kg skier at 2 m/sec2?
2. What is the force on a 1000 kg elevator that is falling freely at 9.8 m/sec2?
3. What is the acceleration of a 50 kg object pushed with a force of 500 newtons?
4. The mass of a large car is 1000 kg. How much force would be required to accelerate the car at a rate of 3 m/sec2?
5. A 50 kg skater pushed by a friend accelerates 5 m/sec2. How much force did the friend apply?
6. A force of 250 N is applied to an object that accelerates at a rate of 5 m/sec2. What is the mass of the object?
7. A bowling ball rolled with a force of 15 N accelerates at a rate of 3 m/sec2; a second ball rolled with the same force accelerates 4 m/sec2. What are the masses of the two balls?
8. If a 60 kg person on a 15 kg sled is pushed with a force of 300 N, what will be person’s

acceleration?

1. A force of 20 N acts upon a 5 kg block.  Calculate the acceleration of the object.
2. An object of mass 300 kg is observed to accelerate at the rate of 4 m/s2.  Calculate the force required to produce this acceleration.
3. A 5 kg block is pulled across a table by a horizontal force of 40 N with a frictional force of 8 N opposing the motion.  Calculate the acceleration of the object.
4. An object of mass 30 kg is in free fall in a vacuum where there is no air resistance. Determine the acceleration of the object.
5. An object of mass 30 kg is falling in air and experiences a force due to air resistance of 50 newtons.
6. Determine the net force acting on the object and
7. calculate the acceleration of the object.
8. A student pushes on a crate with a force of 100 N directed to the right.  What force does the crate exert on the student?
9. A force of 200 N is exerted on an object of mass 40 kg that is located on a sheet of perfectly smooth ice.
10. Calculate the acceleration of the object.
11. If a second object identical to the first object is placed on top of the first object, what acceleration would the 200 N force produce?

1. Just before opening her parachute a skydiver of mass 50 kg reaches terminal velocity. Calculate the force of air resistance.
2. For a person who has a mass 60 kg, calculate the weight in Newtons and in pounds.
3. An object of mass 10 kg is accelerated upward at 2 m/s2.  What force is required?

19. A water skier has a mass of 79 kg and accelerates at 1.4 m/s2. What is the

net force acting on him?

20. What is the mass of an object if it takes a net force of 32 N to accelerate

it at a rate of 0.88 m/s2?

21. A net force of 15 N is applied to a cart with a mass of 2.1 kg. What is the acceleration of the cart?

22. What is the acceleration of a box weighing 666 kg if a force of 777 N is

applied to it?

23. What is the net force needed to lift a full grocery sack of 210 kg mass

uniformly? What is the net force needed to accelerate the grocery sack upward at 1.5

m/s2?