Unit 4 Review Sheet **Name** _____

Terms:

inertia	air resistance	trajectory
force	terminal velocity	vertical velocity
net force	projectile	horizontal velocity

Newton's 1st Law - Law of _____

Newton's 2nd Law - Law of _____

Newton's 3rd Law - Law of _____

I. Problems:

1. What is the weight of an object whose mass is 4.2 kg?

2. If the object in #1 is pushed across the floor with a net force of 20 N, what will the acceleration be?

3. Where would a sack of flour land horizontally from the dropping point if it were dropped out of a plane flying horizontally at 60.0 m/s at an altitude of 300.0 m?

4. While skiing, Ellen encounters an unexpected bump that she leaves traveling horizontally at 12.0 m/s. (a) How far out from her starting point will she land if she falls from a height of 7.00 m? (b) What is the final vertical velocity?

5. A "g" is an acceleration of 9.80 m/s^2. How much force is needed to accelerate a 0.0090 kg object at 3.0 "g's"?

6. What force is required to stop a 1200 kg in 7.0 s if the car is traveling at 22 m/s?

7. a. What is the acceleration of a falling skydiver (mass 72 kg including the parachute) when the upward force of air resistance is equal to $\frac{1}{4}$ of her total weight?

   b. Shortly after opening her parachute, the skydiver descends to the ground at constant velocity. What is the air resistance on her now?

8. A stone is thrown horizontally at 8.0 m/s from the edge of a cliff 78 m high. How far from the base of the cliff does the ball land?

II. The following statements are false. Tell what is wrong with each or change it to a true statement.

1. An object always moves in the direction of the net force applied to it.

2. A horse must pull a cart harder than the cart pulls back on the horse to move forward.

3. Action-reaction forces cancel out so that neither object can accelerate.

4. When a car hits a bug, the bug hits back with the same force and both car and bug accelerate equally.

5. If everyone inside a car pushes forward on the car, they can make the car speed up.

6. To hit a distant target with an arrow, Robin Hood should aim directly at the target.

7. A feather and a hammer will fall with the same acceleration in a vacuum because there is no gravity in a vacuum.

8. The real reason for #7 is that gravity pulls the feather and the hammer with the same force.

9. When the human cannonball leaves the barrel of the cannon, his horizontal motion is accelerated and his vertical motion is uniform.