**Physics Unit 2 Acceleration Test Review**

**Test Setup:**

Multiple Choice: 29 (1 pt each ) Short Answers: 4 (5 pt each) Problems: 8 (6 pt each)

**Short Answers:**

1. Distinguish between the displacement of a traveler who takes a train from New York to Boston and the displacement of a traveler who flies from Boston to New York. Be sure to compare the magnitudes of the displacements
2. Why is the direction of free-fall acceleration usually negative?
3. Describe how applying the brakes to stop a bicycle is an example of force.
4. Why is air resistance consider a form of friction?

**Multiple Choice:**

1. Know the definition of negative displacement and be able to identify it in a problem
2. Know the SI unit for velocity and for acceleration
3. Know the definitions of
4. Acceleration
5. Instantaneous velocity
6. Displacement position
7. weight
8. Know the effects of force on acceleration
9. Be able to identify action-reaction pairs
10. Know the formula for force
11. You will have 2 force problems using cosine to solve
12. If you know an objects acceleration, what info must you have to determine if the velocity is increasing or decreasing?
13. Know the effects of air resistance and no air resistance on an object
14. Be able to read a graph and answer questions
15. Be able to read a free-body diagram
16. Know about free falling objects
17. Know the formula for net force
18. Check over your formula page and make sure you have all of your formulas present

**Problems:**

Be able to solve for : Speed, Average velocity , velocity ,net force, gravitational force, distance, draw a force diagram

**Examples**

1. A pair of glasses are dropped from the top of a 32.0 m high stadium. A pen is dropped 2 seconds later. How high above the ground is the pen when the glasses hit the ground?
2. A hiker travels south along a straight path for 1.5 hours with an average speed of .75km/hr and then travels north for 2.5 hours with an average speed of 0.90 km/hr what is the hikers displacement for the entire trip?
3. A fully loaded Saturn V rocket has a mass of 2.92 x 106kg. Its engines have a continual upward thrust of 3.34 x 107 N . Calculate the downward force, caused by gravity, on the rocket at blastoff. What is the net force acting on the rocket at blastoff?
4. The velocity of an airplane with respect to the air is 425 km/h in a direction 45 degrees north of east. A wind is blowing northward at 75 km/h What is the resultant velocity of the airplane?
5. A car with a mass of 525 kg is being pushed west (left) by a force of 375 from its engine. The coefficient of friction felt by the car is 0.0420. Calculate the acceleration of the car.
6. A 1kg mass box is lying flat on a horizontal surface. The mass is being accelerated to the right at 15m/s 2 If the coefficient of friction between the mass and the surface is .51, draw a free-fall diagram
7. How long will it take a car traveling at a constant speed of 45m/s to cover a distance of 2.5 km?
8. How far will a swimmer travel in 3 min if her speed is 2.5 km/hour
9. You are pulling on an object at an angle of 25 degrees above the horizontal. If the horizontal component of the force is 45.6N, what is the force exerted on the handle to lift the object
10. An object weighing 250 N is held in place on a frictionless 30 degree slope by a rope attached at the top. The rope is parallel to the slope. Find the normal force of the slope acting on the object