Name_____

Regular Physics--Newton's Second Law

Draw a force diagram for the following situations. Label all appropriate forces.

1. A 110 kg physics teacher being pulled across frictionless ice with a rope that has a tension of 100 N.

2. A 1500 kg car needs a force of 12,000 N to maintain a steady speed of 60 mph on flat ground.

3. A 50 kg woman standing on a hill that makes an angle of 30° with the horizontal.

Solve the following problems. ***You must have a force diagram for each problem to receive full credit! Use g= 10 m/s^2 for all problems except as noted.***

4. A 50 kg box is slid across a floor by a rope with a tension of 100 N. If the box experiences a 35 N frictional force, determine the acceleration of the box.

5. A skydiver with a mass of 85 Kg jumps out of a plane. At a certain moment, the skydiver experiences a frictional force of 615 N. At that moment, what is the acceleration of the skydiver?

6. A skydiver with a mass of 85 Kg jumps out of a plane. At a certain moment, the skydiver experiences a frictional force of 833 N. Use 9.8 m/s^2 for gravity. At that moment, what is the acceleration of the skydiver?

7. A force of 300 N is applied to a student of mass 50 kg who is sitting in a 10 kg chair on a frictionless surface. Determine the combined acceleration of the chair and student.

8. What is the net force is required to produce an acceleration of 5 m/s^2 on a 10,000 kg truck?

9. A 20 kg bucket is held up by a rope. If the bucket is stationary, what is the tension in the rope?

10. What is the weight of a 15 kg box on the earth where the acceleration due to gravity is 9.8 m/s^2

11. What is the weight of a 15 kg box on the moon where the acceleration due to gravity is 1.63 m/s^2

12. What is the mass of a student who has a weight of 750 N on the earth?

13. Which would have the most mass, a 10 N weight on the earth or a 10 N weight on the moon? Why

14. If a crate is moving to the left and has a net force acting to the right, explain what will happen to the speed of the crate. Be specific to receive full credit.