Name _____ Period_____

Force Problems — **DRAW A PICTURE**!

$F = ma$ $F = mg$ $g = 9.8\ m/s^2$ $N = kg \cdot m/s^2$

1. What is the mass of a dog that weighs 75-N?

2. An astronaut with all her equipment has a mass of 95-kg.

   a. How much will she weigh on the Earth?

   b. How much will she weigh on the moon where acceleration to gravity is 1.67-m/s^2.

3. An object with a mass of 15-kg is observed to accelerate at $3m/s^2$. What is the net force on the object?

4. A net force of 200-N acts an object with a mass of 40-kg on. What is the acceleration of the object?

5. An object is observed to accelerate at 14 m/s^2 while under the influence of 270-N net force. What is the object's mass?

6. A net force of 150-N acts upon an object with a mass of 25-kg for a time period of 4 seconds. What is the acceleration acting on the object?

   a. If the initial velocity of the object is 13-m/s, what is the final velocity?

   b. What is the distance traveled of the 25-kg object?

Name _____ Period_____

Force Problems – Answer on another sheet of paper - **DRAW A PICTURE**!

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7. An object with a mass of 9-kg is observed to have an initial velocity of 3 m/s. Twelve seconds later its velocity is 24 m/s. What is the acceleration acting on the object?

   a. What must be the force acting on the object during that time?

   b. If the 9-kg object initial position is 15-m from the reference point, what will be its final position?

8. A 95-N force acts upon an object. It is initially at rest and is observed to travels distance of 400-m in 6-seconds. What is the acceleration acting on the object?

   a. What is the mass of the object?

   b. What is the final velocity of the 95-N object?

9. A parachutist is falling under the influence of Earth's gravity. His mass is 80-kg.
   a. Neglecting air resistance, what will be his acceleration?

   b. What, therefore, is the net force acting on the parachutist (still neglecting air resistance)?

   c. Now he opens the parachute, which provides an additional force of 300-N in the opposite direction of gravity. What is the net force acting on the parachutist?

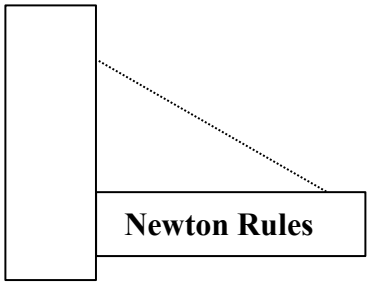
   d. With his parachute now open, what will the acceleration be?

e. Repeat # 9 for a parachutist with a mass of 150-kg. Will his acceleration for part d be more, less or the same? Explain.

10. A sled is being pulled along a horizontal road at constant speed by means of a rope that makes a 25^{o} with the horizontal. If the friction between the sled and the snow is 84-N, how much is the forward pull?

    a. How much is the tension on the rope?

11. A sign is supported as shown; the tension in the rope is 350-N. How much does the sign weigh if the angle between the rope and the wall is 40^{o}?



12. A 20-kg pile of books is resting on a plank tilted so that it makes an angle of 20^{o} with the ground. How much force do the books exert against the plank?

13. A force of 20-N is needed to push a wagon up a frictionless 35^{o} slope. How much does the wagon weigh?