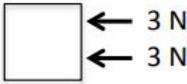


# ICP: Newton's Law and Gravity Notes

Name: \_\_\_\_\_

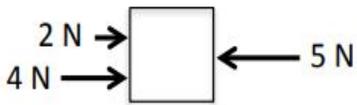
- **Review.** Calculate the net force of the problems below!



Magnitude (Net Force): \_\_\_\_\_

Direction:  
Left or Right or Stationary

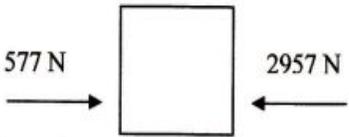
Balanced or Unbalanced



Magnitude (Net Force): \_\_\_\_\_

Direction:  
Left or Right or Stationary

Balanced or Unbalanced



Magnitude (Net Force): \_\_\_\_\_

Direction:  
Left or Right or Stationary

Balanced or Unbalanced

- **Newton's First Law**

An object in \_\_\_\_\_ tends to stay in \_\_\_\_\_ unless acted upon by an unbalanced force and an object at \_\_\_\_\_ tends to stay at \_\_\_\_\_ unless acted upon by an unbalanced force.

This is known as \_\_\_\_\_.

- **Newton's Second Law**

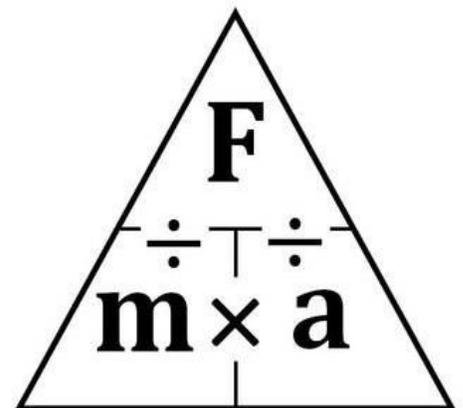
Force of an object is directly proportional to \_\_\_\_\_ and directly proportional to \_\_\_\_\_.

$$F = ma$$

Force must be in \_\_\_\_\_ (N).

Mass must be in \_\_\_\_\_ (\_\_\_\_\_).

Acceleration must be in \_\_\_\_\_.



- **Newton's Third Law**

As object A exerts a force on object B, object B exerts an \_\_\_\_\_ and \_\_\_\_\_ force on object A.

- **Gravity**

\_\_\_\_\_ air resistance, two objects dropped from the \_\_\_\_\_ height at the \_\_\_\_\_ time will hit the ground at the same time. \_\_\_\_\_ is a weak force that depends on the \_\_\_\_\_ (like a golf ball and a bowling ball). It pulls every mass toward every other mass.

Gravity = \_\_\_\_\_

- **Terminal Velocity**

*What is it?* When \_\_\_\_\_ slows the gravitational acceleration of an object, the object reaches its \_\_\_\_\_ — its terminal velocity (\_\_\_\_\_ mph).

*How does it happen?* When \_\_\_\_\_ and \_\_\_\_\_ become balanced, the object reaches terminal velocity.

*What is terminal velocity of a person?* Without parachute a person in \_\_\_\_\_ can reach speeds of 320 km/hour, or \_\_\_\_\_ miles/hour. When the parachute is deployed, a person reaches a new terminal velocity of 5-10 km/hour, or 3-6 mph — a safe landing speed.

*What did Einstein think about gravity?* Einstein's Theory of Relativity says that \_\_\_\_\_ is not an invisible force, but that it is a \_\_\_\_\_ of the fabric of \_\_\_\_\_ caused by \_\_\_\_\_ objects—kind of like a bowling ball thrown on a rubber mat. As a result, smaller objects move in toward the Earth. As the Earth rotates, it churns the mat, dragging space and time with it.

- **Newton's Law of Universal Gravitation**

All masses are \_\_\_\_\_ to all other masses. The force between two masses

\_\_\_\_\_ as the masses move \_\_\_\_\_ apart.