Question#24918

I am unable to understanding about all the laws of Newton's motion
please help me in understanding all the three laws of Newton's Plz
help me I am beginner in Physics Plz Help me!

Answer:

**Newton's laws of motion:**

1. **First law**:

The first law states that if the net force (the vector sum of all forces acting on an object) is zero,
then the velocity of the object is constant. Velocity is a vector quantity which expresses both
the object's speed and the direction of its motion; therefore, the statement that the object's
velocity is constant is a statement that both its speed and the direction of its motion are
constant.

Consequently,

- An object that is at rest will stay at rest unless an unbalanced force acts upon it.
- An object that is in motion will not change its velocity unless an unbalanced force acts
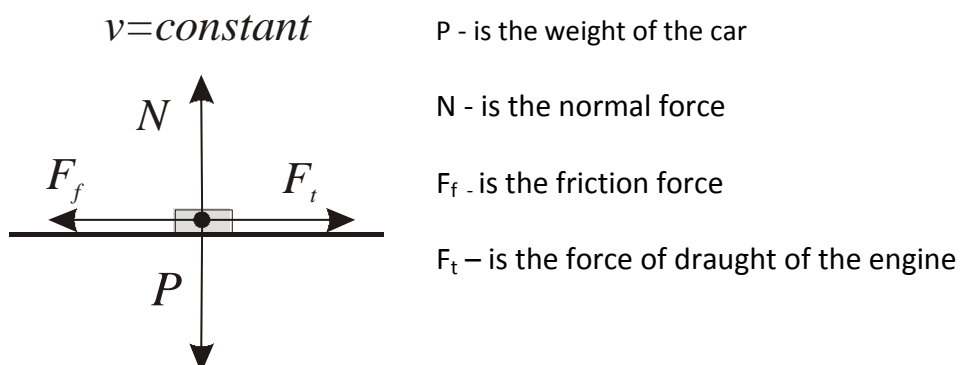 upon it. This is known as *uniform motion*.

Examples:

A body on the spring

$v=0$ 　　P - is the weight of the body (is the force of gravity)

F- is the force of the spring

F

P
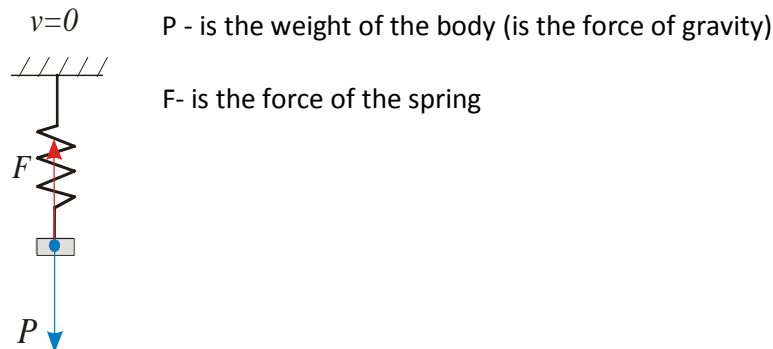
The net force is equal to zero.

A car on the road moving with the constant speed on the direct line

$v=constant$ 　　P - is the weight of the car

N 　　N - is the normal force

F_f 　　　F_t 　　F_f - is the friction force

P 　　　F_t – is the force of draught of the engine

The net force is equal to zero.

2. **Second law**: The acceleration **a** of a body is parallel and directly proportional to the net force **F** acting on the body, is in the direction of the net force, and is inversely proportional to the mass m of the body, i.e., **F** = m**a**.

The second law states that the net force on an object is equal to the acceleration product on weight of the body.

Moving an object an inclined plane
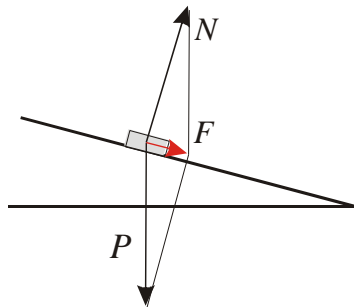
P - is the weight of the object

N - is the normal force

F - is the net force (the vector sum of N and P)

An object moving with acceleration   a=F/m, were m is the mass of the object.

3. **Third law**: When a first body exerts a force F_1 on a second body, the second body simultaneously exerts a force $F_2 = -F_1$ on the first body. This means that F_1 and F_2 are equal in magnitude and opposite in direction.

The third law states that all forces exist in pairs: if one object A exerts a force F_A on a second object B, then B simultaneously exerts a force F_B on A, and the two forces are equal and opposite: $F_A = -F_B$. The third law means that all forces are *interactions* between different bodies, and thus that there is no such thing as a unidirectional force or a force that acts on only one body. This law is sometimes referred to as the _action-reaction law_, with F_A called the "action" and F_B the "reaction". The action and the reaction are simultaneous, and it does not matter which is called the *action* and which is called *reaction*; both forces are part of a single interaction, and neither force exists without the other.

At the first example (a body on the spring)

v=0
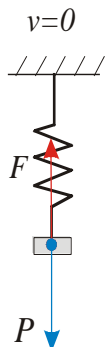
A body exerts a force P on a spring.

A spring exerts a force F on a body.

Two force P and F are equal and opposite.

F

P