

IMPORTANT TERMS:

- Force
- Net force
- Vector
- Vector quantity
- Scalar quantity
- Mechanical equilibrium
- Equilibrium rule
- Support force
- resultant

EQUATIONS:

$$\Sigma F = 0$$

UNIT I: MECHANICS

Chapter 2: Mechanical Equilibrium

I. Force (2.1)

A. **force**– is a _____ or _____

1. A **force** is needed to change an object's state of _____

2. State of motion may be one of two things

a. At _____

b. **Moving uniformly** along a _____ path.

B. Net force

1. Usually more than one force is acting on an object

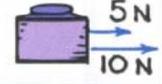
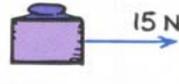
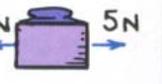
2. **combination of all forces** acting on object is called _____.

3. The net force on an object changes its _____

4. Can _____ or _____ to get resultant net force

5. If forces acting on object equal _____ then we say the **net force** acting on the **object = 0**

6. Scientific units for force are _____

APPLIED FORCES	NET FORCE
	
	
	

C. Tension and Weight

1. _____ is a “**stretching force**”

2. When you hang an object from a spring scale the there are _____ forces acting on object.

a. **Force of** _____ pulling down (also called _____)

b. **Tension** force pulling _____

c. Two forces are **equal** and **opposite in direction** and add to zero (**net force = _____**)

D. Force Vectors

1. Forces can be represented by _____

a. **length** of arrow represents **amount**
(_____) of force

b. _____ of arrow represents
direction of force

c. Refer to arrow as a _____
(represents both **magnitude** and **direction** of force)

2. **Vector quantity**- needs both _____
and _____ to complete description (i.e.
force, velocity, momentum)

3. _____ **quantity**- can be described by
_____ **only** and has no direction (i.e.
temperature, speed, distance)

II. Mechanical Equilibrium (2.2)

A. Mechanical equilibrium- a state wherein **no physical**
_____ **occur** (state of steadiness)

1. When **net force equals** _____, object is said to
be in _____ **equilibrium**

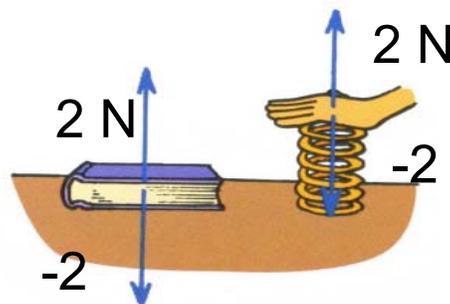
a. Known as _____ **rule**

b. Can express rule **mathematically** as



1). Σ symbol stands for “**the** _____ **of**”

2). **F** stands for “_____”



$$\Sigma F = (2 - 2) = 0$$

III. Support Force (2.3)

A. _____ **force**- the **upward** force that balances the weight of an object on a _____

1. The upward force balances the _____ of an object
2. Support force often called _____ **force**

B. For an object at rest on a horizontal surface, the support force must _____ the objects _____.

1. Upward force is _____ (____) and the downward force is _____ (____).
2. Two forces add mathematically to _____

IV. Equilibrium of Moving Objects (2.4)

A. Equilibrium can exist in both objects at _____ and objects moving at constant _____ in a _____-line path.

1. **Equilibrium** means **state of _____ change**
2. _____ of forces equal zero $\sum F = 0$

B. Objects at rest are said to be in _____ **equilibrium**

C. Objects moving at constant speed in a straight-line path are said to be in _____ **equilibrium**

V. Vectors (2.5)

A. Parallel vectors

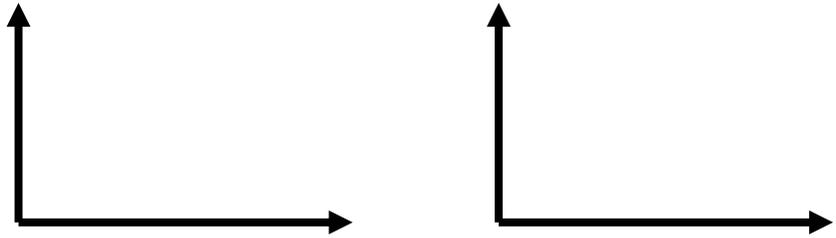
1. **Add** vectors if in _____ **direction**
2. **Subtract** vectors if in _____ **direction**
3. The sum of two or more vectors is called the _____ **vector**.



B. Non-parallel vectors

1. Construct a _____ to determine **resultant vector**
2. The _____ of the parallelogram shows the **resultant**

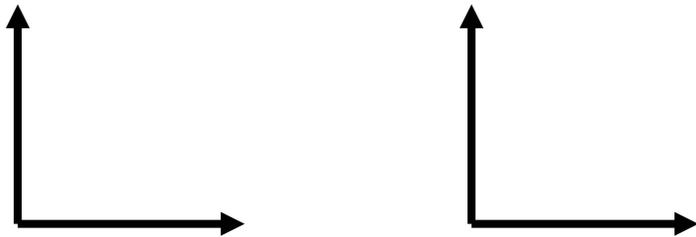
a. Perpendicular vectors



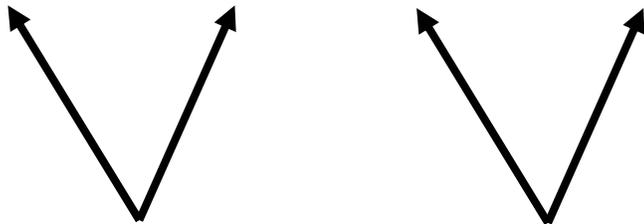
b. Perpendicular vectors with **equal** sides (special case)

1). For a square the length of diagonal is $\sqrt{2}$ or 1.414

2). Resultant = _____ x one of sides



c. Parallelogram (**not perpendicular**)



C. Applying the Parallelogram Rule- as angle _____, _____ increases.

