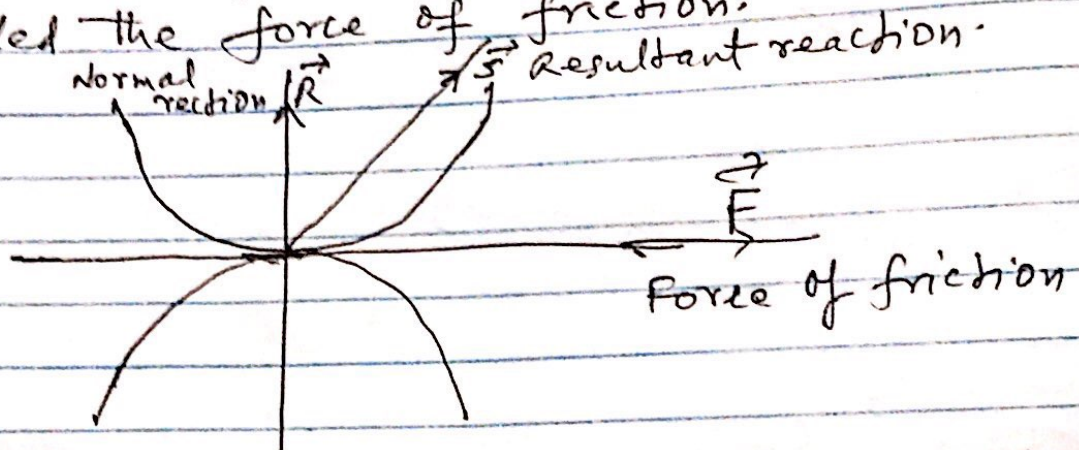


FRICTION

Definition: If two bodies be in contact with one another, the property of two bodies, by virtue of which a force is exerted between them at the point of contact to prevent one body from sliding on the other, is called friction and the force exerted is called the force of friction.



Properties

1. By friction we shall mean the force of friction.
2. The amount of friction is variable, it increases but not unlimitedly.
3. Friction is a self adjusting force.
4. Friction is a passive force.

Kinds of friction

1. Limiting friction: When one body is just on point of sliding upon another body, the friction then exerted is called limiting friction and the equilibrium then is said to be limiting.

2. Statical friction: When one body is in a position of equilibrium (but not limiting) upon another, then the friction then exerted is called statical friction. Its magnitude is less than that of limiting friction.

3. Dynamical friction: When one body actually moves upon another body, the friction exerted is called dynamical friction. Its magnitude is less than that of the limiting friction.

Laws of friction:

1. The point of contact of the bodies is the point of application of the force of friction.
2. The direction of friction is opposite to the direction in which the body moves or tends to move.
3. The magnitude of friction just sufficient to prevent motion.
4. The magnitude of the limiting friction between two bodies bears a constant ratio to that of the normal reaction between them. If \vec{F} be the limiting friction and \vec{R} is the normal reaction then
$$\frac{F}{R} = \mu \Rightarrow F = \mu R$$
 The constant ratio μ depends upon the substances of which the bodies are made. μ is called the coefficient of friction.
5. The magnitude of the limiting friction is independent of the area and shape of the surfaces in contact.

6. When motion takes place by one body sliding upon the other, the friction is independent of the velocity and is proportional to the normal reaction. In this case, the ratio of the friction to the normal reaction is slightly less than μ .