Newton's Laws

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FORCES: - · a force is a push or a pull

· the 4 fundamental forces are: the electromagnetic force, gravitational force, strong nuclear force and weak nuclear force

FRICTION: - a contact force parallel to the contact surfaces

· static friction ads to prevent objects from sliding -> f = msN

· kinetic friction ands to make stiding objects slow down —> f = MaN

TENSION: - · an ideal chard has zero mass, does not stretch, and the tension is the some throughout the chard

SPRING FORCE: - exerted by a compressed or stretched spring upon any object that is attached to it.

· on object that compresses or dretches a spring is always acted upon by a force that restores the object to its rest lequilibrium position.

NORMAL FORCE: - · acts in the direction be to the contact surface

LAWS OF MOTION: - . if an object move with uniform motion Coordiant velocity), no force is required for the motion to be maintained, for example, moon-earth system, electron-nucleus system.

on object accelerates only if the net force adding on it + zero, else acc = zero, velocity remains another, and object is said to be in equilibrium.

NEWTON'S LAWS: - 1. an object at rest | in motion will stay at rest | in methon at const-velocity, unless added upon by an unbalanced force

2. acceleration of an object is directly proportional to the net force acting on it, and inversely proportional to its mass $C \le k = ma$)

3. every action force has an equal and appearts reaction force $CF_A = -F_B$)

INERTIA: - the tendency of an object to resist any attempt to change its velocity

MASS: - how much inertia on object has

WEIGHT: - weight = magnitude of growtaltand force exerted on abject

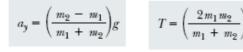
ATWOOD'S MACHINE:-

When two objects of unequal mass are hung vertically over a frictionless pulley of negligible mass, Determine the magnitude of the acceleration of the two objects and the tension in the lightweight cord.

$$\sum F_y = \, m_2 g - \, T = \, m_2 a_y$$

$$\sum F_y = T - m_1 g = m_1 a_y$$

$$-m_1g + m_2g = m_1a_y + m_2a_y$$



Special Cases When $m_1 = m_2$, then $a_y = 0$ and $T = m_1 g$, as we would expect for this balanced case. If $m_2 \gg m_1$, then $a_y \approx g$ (a freely falling body) and $T \approx 2 m_1 g$.

