Tuesday, April 2/13
Physics 112/111

Rewrites for Test Unit #1 - Today at Noon

Quiz C4: Date - Wed - April 3

Midterm: Date - Thursday - April 11

Friday - April 12

Course Selection

1. Return: PP #7 - Page 144
2. Check ->Worksheet - Extra Practice: Weight and Friction (C4)
3. PFU: Page 151, #26-28, 30-32, 34
4. Chapter 5 - Newton's Laws
5. Newton's First and Second Laws
6. Text: Page 163, PP #1-3 HW P2

   Handout: Problems - Newton's Second Law
   Text - Page 168 #4-7

Chapter 5 - Newton's Laws (Page 152)

Isaac Newton

(1642-1727)

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Inertia

Inertia is the tendency of an object to resist changes in its state of motion.

Mass is a measure of an object's inertia.

More Matter → More Mass → More Inertia

Newton's First Law of Motion (The Law of Inertia)

An object at rest tends to stay at rest and an object in motion tends to stay in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

net force

- object at rest
- object with uniform motion

State of equilibrium.

Newton's Second Law of Motion

The acceleration of an object produced by a net force is:

- directly proportional to the magnitude of the net force

$a \propto F_{net}$

- inversely proportional to the mass of the object

$a \propto \frac{1}{m}$

Sample Problems

An object is accelerating at 2.0 m/s^2 east.

1. If the net force is tripled, what is the object's new acceleration?

2. If the mass doubles, what is the object's new acceleration?

3. If the net force is tripled and the mass is ~~quadrupled~~, what is the object's new acceleration?

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Newton's Second Law - Equation

$$\vec{a} = \frac{\vec{F}_{net}}{m}$$

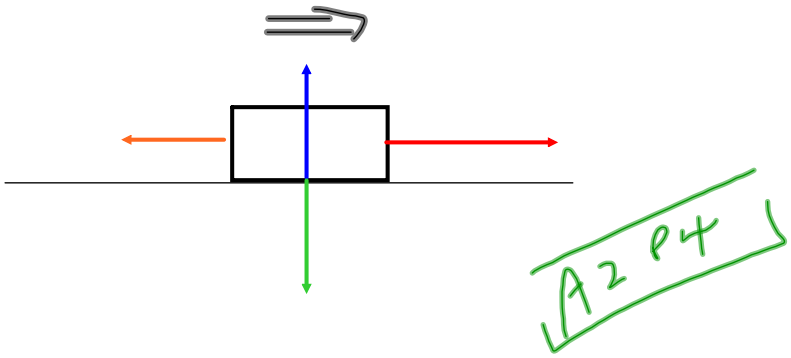
$$\vec{F}_{net} = m\vec{a}$$

← Starting point for force problems involving acceleration.

$\vec{F}_{net}$ -> net force (N)
m -> mass (kg)
$\vec{a}$ -> acceleration (m/s^2)

Note: The acceleration of an object has the same direction as the net force acting on the object.

NOTE: The net force equation is applied to different dimensions independently.



A2 P4

$\vec{F}_{netx}$

$\vec{F}_{nety}$

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