Physics 112

Monday, June 6/16

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1. Return Marks -> Test - Unit 3
2. Reports
3. Exam Review

Physics 112 - Exam Review

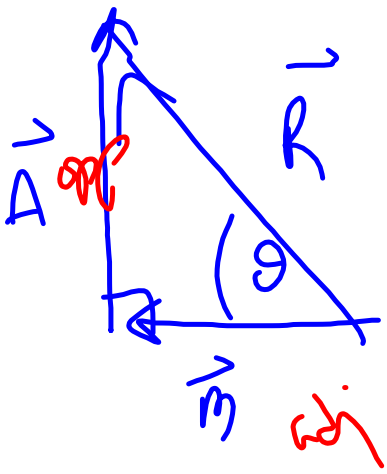
Find $\vec{R}$ analytically.

forces.

Find the resultant of $\vec{A}$ = 67 N, N and $\vec{B}$ = 51 N, W.

N
W E
S

Sketch.



adj

① Magnitude

$R^2 = A^2 + B^2$

$R = \sqrt{(67)^2 + (51)^2}$

$R = 84$ N

② Direction

$\tan\theta = \frac{A}{B}$

$\tan\theta = \frac{67}{51}$ ASD.

$\theta = 53°$ ASD.

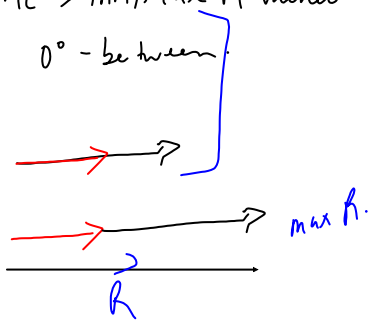
~~84N, [53° N of W]~~

$\vec{R}$ = 84N, 53° N of W

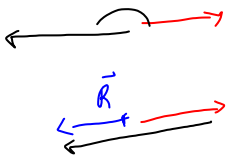
$\vec{R}$ = 84N [W 53° N] ret.

MC → Min/Max R Values.

0° - between



180° - between



R min

→ Which angle produces the largest R.

a) 0°
b) 90°
c) 90°
d) 180° ↳ smallest R

Conversions.

cm ⟷ m

1m = 100 cm
1cm = 10^{-2} m

m/s ⟷ Km/h

÷3.6 (Km/h → m/s)
×3.6 (m/s → Km/h)

Km ⟷ m

KW ⟷ W

1000m = 1Km
1000W = 1KW

1min = 60s

1h = 3600s

ms ⟷ s

1ms = 10^{-3} s

ns ⟷ s

1ns = 10^{-9} s

g ⟷ Kg

1000 g = 1 Kg

Physics 112 - Exam Review

Kinematic Equations

how objects move.

$\vec{v} = \frac{\vec{d}}{t}$

uniform motion | constant velocity

$\vec{v}_f = \vec{v}_i + \vec{a}t$

$\vec{d} = \frac{1}{2}(\vec{v}_i + \vec{v}_f)t$

$\vec{d} = \vec{v}_i t + \frac{1}{2}\vec{a}t^2$

$\vec{v}_f^{\,2} = \vec{v}_i^{\,2} + 2\vec{a}\vec{d}$

uniformly acc'd motion
→ acc. is constant
→ vel. is changing

Freely Falling Body Problem

June 2016

Science 122

Monday, June 6/16

http://mvhs.nbed.nb.ca/

1. Return Test - Nuclear Physics

2. Progress Reports

3. Worksheet #63
   Worksheet #64
   Worksheet - Assigning Oxidation Numbers
   Worksheet - Redox Reactions and Electrochemistry

4. Assignment - Electrochemistry -> Wed., June 8/16.

Science 10

Monday, June 6/16

http://mvhs.nbed.nb.ca/

1. Article - Risks Feared in Bioengineered Insects
   - 1 Day Late
2. Assigment - Ecology -> Wed.
3. Exam Review

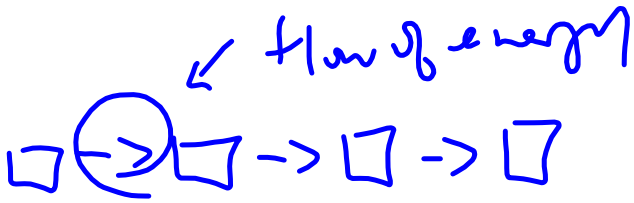
Science 10 - Last Assignment!

- ecology – def
- ecological levels in an ecosystem: organism
  - species
  - population
  - community
  - ecosystems
  - ecotones
  - biomes

def. biosphere

simple → complex

- indicator species
- abiotic and biotic factors
- organisms: producer
  - consumer
    - herbivore
    - carnivore
    - omnivore
  - decomposer



- food chain
- detritus food chain
- primary energy source (sun)
- photosynthes (word and balanced chemical equations)
- trophic levels: primary producer (autotroph)
  - primary consumer (1st heterotroph - herbivore)
  - secondary consumer (2nd heterotroph - 1st carnivore)
  - tertiary consumer (3rd heterotroph - 2nd carnivore)
  - quaternary consumer (4th heterotroph - top carnivore)
- food web

- biodiversity

- bioaccumulation and biomagnification (ie/ mercury, DDT)
  - toxin
  - dosage
  - duration

- sustainability

- types of substances: organic (proteins, sugars, fats)
  inorganic (CO_2, H_2O, NH_3)

- movement of energy (⟶) and matter (↻) through ecosystems

- matter and atoms — flows / cycles

- biogeochemical cycles ✓ ✓ ✓

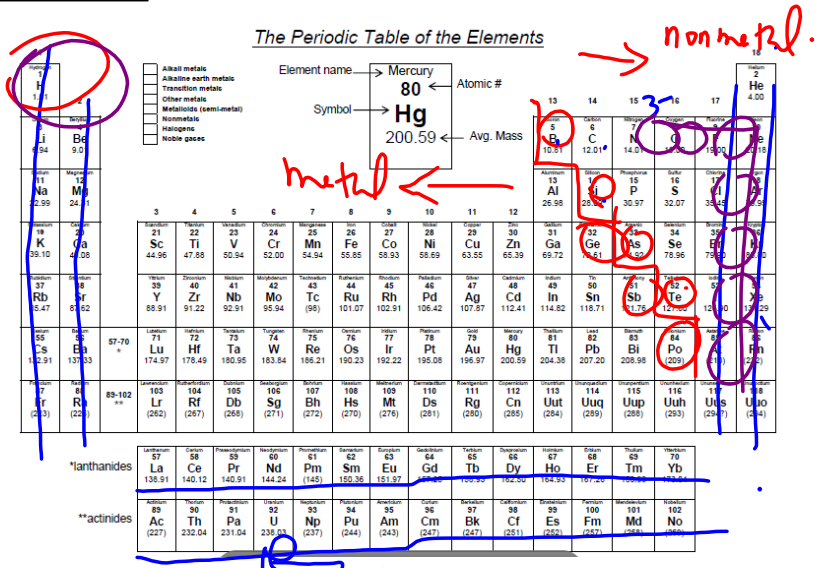
- reservoirs - atmosphere, oceans, earth
  N_2 > O_2 > C — atmosphere ✓

- carbon cycle - key element in living things
  - photosynthesis and cellular respiration ✓
    (word and balanced chemical equations)
  - concept map

- nitrogen cycle - needed to make proteins and DNA
  - nitrogen fixation (N_2 -> NO_3^-)
  - denitrification (NO_3^- -> N_2)

Science 10 - Exam Review

Periodic Table



Element/Atoms/Ions

Element Name	Element Symbol	Atomic Number	# e Atom	Ion Name	#e Ion	Ion Symbol
sodium	Na	11	11	Sodium ion	10	Na^+
fluorine	F	9	9	fluoride ion	10	F^-
neon	Ne	10	10	—	—	—

Ionic Compounds

- → transfer of e⁻'s.
- → electrically neutral
- → binary ionic cpds. NaCl
- → polyatomic ions NH_4SO_4
- → multi-valent metal $CuSO_4$

Copper(II)sulfate.

Molecular Compounds

- → sharing of e⁻'s.
- → prefixes.

CO_2 → Carbon dioxide

diatomic molecules: $O_2, N_2, F_2, Br_2, Cl_2$, etc.

Sg → Sulfur P_4 – phosphorous

Chemical Reactions

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1. Exam Topics

2. Marks -> Quiz - Electrostatics

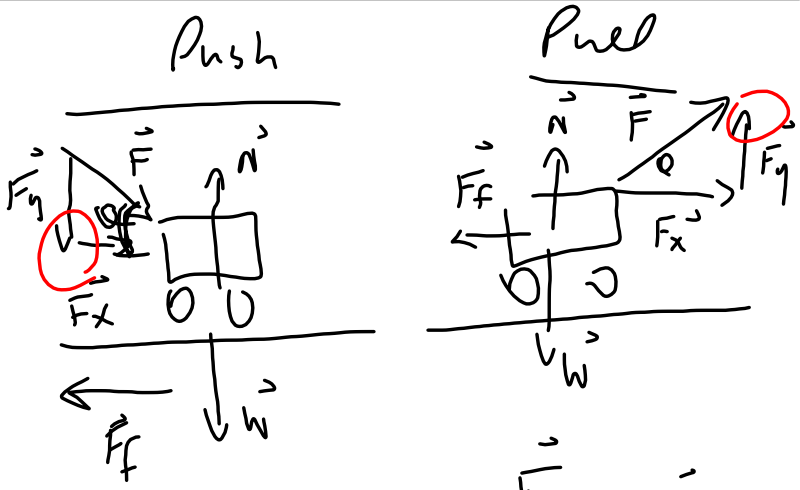
3. Worksheet - Textbook: Page 719, C15 - PP #27-31 (S. Circuits)
   Textbook: Page 724, C15 - PP#32-35 (P. Circuits)

   Textbook: Page 728, PP #36-37
   Textbook: Page 749, PFU #33-34 } (C. Circuits)

4. Exam Review

Physics 122 - Exam Review

Push/Pull Problems



$\vec{F}_{net_x} = m\vec{a}_x$ $\quad$ $\vec{F}_{net} = m\vec{a}$

$+\vec{F}_x - \vec{F}_f = 0$ [const. vel]

$+F_x - F_f = m(+a)$ [acc]

$F_x = F\cos\theta$ $\quad$ $F_y = F\sin\theta$

F_x adj

$F_f = \mu N$

$F_f = \mu(mg + F\sin\theta)$

$N \neq W$

$F_{net_y} = ma_y$

$+N - W - F_y = 0$

$N = W + F_y$

$N = mg + F\sin\theta$

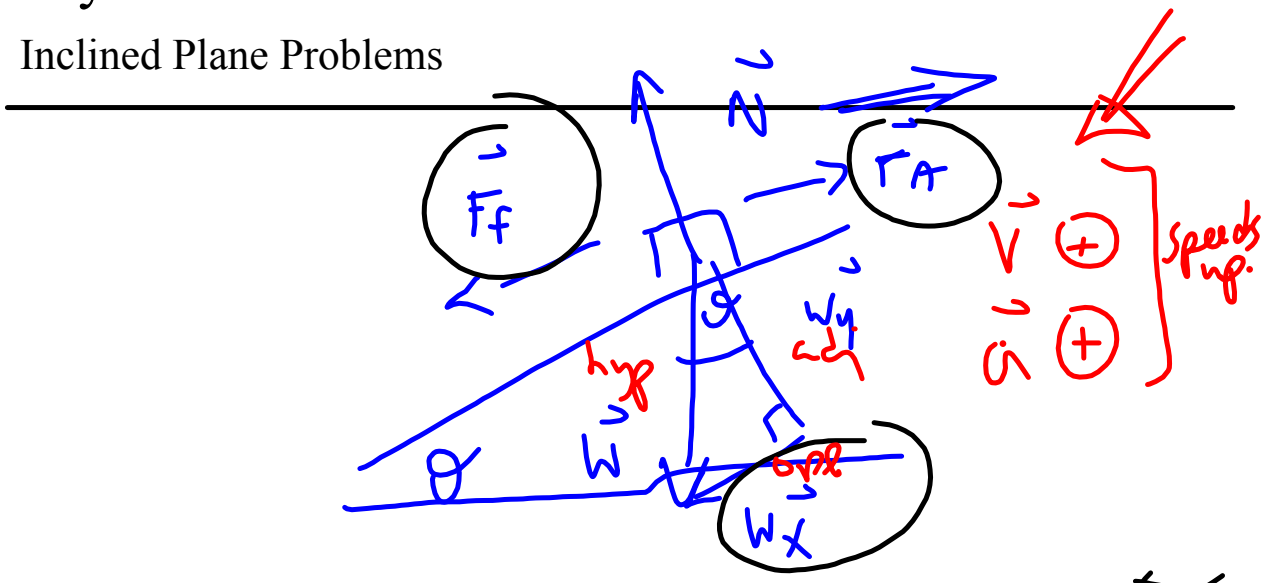
Push

$F\cos\theta - \mu(mg + F\sin\theta) = ma$

$F\cos\theta - \mu mg - \mu F\sin\theta = ma$

Physics 122 - Exam Review

Inclined Plane Problems



$$F_{net_x} = ma_x$$

$$+F_A - F_f - W_x = m(+a)$$

$$F_A - \mu N - Wx = ma$$

$$F_A - \mu W_y - Wx = ma$$

$$F_A - \mu W\cos\theta - W\sin\theta = ma$$

$$F_A - \mu mg\cos\theta - mg\sin\theta = ma$$