

## Science 10

Monday, May 28/18

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Roller Coaster: Due: Friday, June 1/18  
Optional Assignment - Graphing Characters (Max. 2)  
- Due: Friday, June 1/18

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1. SA - Physics #2 - Still to be written by some.
  2. FA - Position and Displacement
  3. Resultant Displacement
  4. Average Velocity
  5. [Worksheet: Constant and Average Velocity Problems](#)
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6. Position vs Time Graphs
7. Worksheets - Position vs Time Graphs
8. Velocity-Time Graphs
9. Worksheet - Velocity vs Time Graphs
10. Acceleration
11. Comparing Directions of Velocities and Accelerations
12. Sample Problems - Acceleration
13. Worksheet - Acceleration

# Physics 112

Monday, May 28/18

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1. Exam Review - Problem #1 -> See Next Page
2. Return -> FA -  $E_k$  and Work-  $E_k$  Theorem
3. Check:  
Worksheet: C6 PP #27 and 29 -> Grav. Pot. Energy  
C6 PP #30-33 -> W-  $E_g$  Theorem

4. Restoring Force

5. Hooke's Law

6. Elastic Limit

7. Model Problem

8. Elastic Potential Energy

9. Model Problem

10. Worksheets:

Textbook - C6 PP #35-37 -> Hooke's Law

Textbook - C6 PP #38-40 - Hooke's Law and  $E_e$

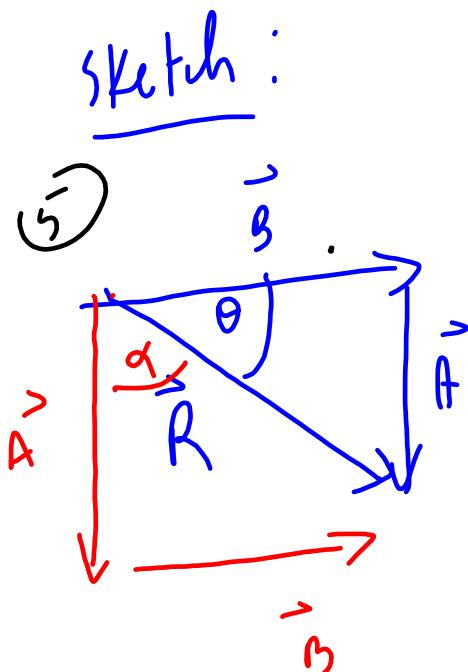
Textbook - C6 PFU

Exam Review - Calculating  $\vec{R}$  #1 - May 28

$\vec{A} = 28.9 \text{ m/s}^2, \text{ S}$  and  $\vec{B} = 37.1 \text{ m/s}^2, \text{ E}$ . Calculate  $\vec{R}$ . (10)

$$\vec{A} = 28.9 \text{ m/s}^2, \text{ S}$$

$$\vec{B} = 37.1 \text{ m/s}^2, \text{ E}$$



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

$$R = \sqrt{A^2 + B^2} \leftarrow$$

$$R = \sqrt{(28.9)^2 + (37.1)^2}$$

$$R = 47.0 \text{ m/s}^2$$

$$\tan \theta = \frac{28.9}{37.1} \leftarrow$$

$$\theta = 37.9^\circ$$

$$\vec{R} = 47.0 \text{ m/s}^2, 37.9^\circ \text{ S of E} \quad \textcircled{1}$$

$$52.1^\circ \text{ E of S}$$

# Physics 122

Monday, May 28/18

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1. SA: U2 - S1 and S2 - Tuesday, May 29
  2. Kepler's Three Laws of Planetary Motion - Experiment 8.1  
Due: Tues → May 29 (at the latest)
  3. Topics for Final Exam  
Exam Review - Problem #1
  4. Check:  
[Worksheet - Kepler's Third Law Problems](#)
- 

5. Universal Law of Gravitation
6. Worksheet - Universal Law of Gravitation
7. Gravitational Field Strength
8. Calculating the Value of "g"
9. Orbital Speed
10. Three Basic Orbits
11. The Period of an Orbiting Object
12. Worksheets - Speed, Period, Etc.

## Physics 122/121 - Topics - Final Exam

### Unit 1

- > force problems
  - push/pull
  - suspended objects
  - incline plane
- > static torque
  - horizontal
  - involving an angle
- > relative velocity (boat, plane and intersection problems)
- > collisions
  - 1 D
    - simple
    - elastic/inelastic
  - 2D
    - collision/explosion

### Unit 2

- > projectiles
  - horizontal
  - fired at an angle
- > circular motion
  - horizontal circular motion
  - banked and unbanked curves
- > Kepler's Laws (3)
- > Law of Universal Gravitation
- >  $g$ ,  $v$  and  $T$  of satellites, moons, planets, etc.
- > SHM
  - pendulum
  - mass on a spring

Unit 3

-> electrostatics

- types of electrical charges (2)
- transfer of charge between identical objects/conservation of energy
- charging objects
  - by electrification by friction
  - by conduction
  - by induction
- electric force - Coulomb's Law
  - 2 charges
  - 3 charges
- electric fields
  - diagrams
  - electric field strength
- electric potential energy
- electric potential difference

-> electric current

- conventional current/electron flow
- circuit symbols
- open/closed circuits
- ammeters/voltmeters
- resistance in a wire?
- Ohm's Law
- power
- circuits
  - VIR chart
  - series
  - parallel
  - complex

## June 2018

Format - multiple choice = 20  
problems = 10

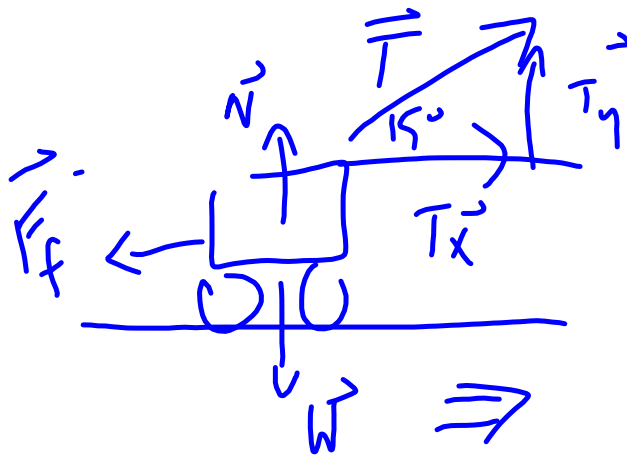
1. push/pull OR inclined plane problem
2. circular motion OR relative velocity
3. static torque problem
4. 2D collision/explosion
5. projectile fired at an angle
6. Law of Universal Gravitation and  $g$ ,  $v$  and  $T$  of satellite or planet, etc.
7. SHM - mass on a spring
8. Coulomb's Law - 3 charges
9. electric field - diagram, magnitude and direction
10. circuit - complete VIR chart

# P122 - Exam Review - Problem #1

## Pull Problem

 $6.6 \times 10^2 \text{ N}$ 

A 200 kg cart is pulled along a level surface by a rope angled at  $15^\circ$  above the horizontal. If the cart's speed increases at a rate of  $1.6 \text{ m/s}^2$ , what is the magnitude of the tension in the cable? Assume the coefficient of friction between the cart and the surface is 0.18.



$$F_{\text{net}} = ma$$

$$+T_x - F_f = m(a)$$

$$T \cos 15^\circ - \mu N = ma$$

$$N \neq W$$

$$N + T_y - W = 0$$

$$T \cos 15^\circ - \mu (mg - T \sin 15^\circ) = ma$$

$$N = W - T_y$$

$$N = mg - T \sin 15^\circ$$

$$T \cos 15^\circ - \mu mg + \mu T \sin 15^\circ = ma$$

$$T \cos 15^\circ + \mu T \sin 15^\circ = ma + \mu mg$$

$$T = \frac{ma + \mu mg}{\cos 15^\circ + \mu \sin 15^\circ}$$

$$T = 6.6 \times 10^2 \text{ N. } \checkmark$$

The magn. of tension is \_\_\_\_\_.

## Science 122

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1. Return -> FA - Build a Table of Redox Half-Reactions
  2. 5 Steps For Predicting Redox Reactions
  3. [Worksheet: #64](#)
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4. Oxidation Numbers/States
5. Rules for Assigning Oxidation Numbers
6. Worksheet - Assigning Oxidation Numbers
7. Balancing Redox Reactions Using Oxidation Numbers
8. Chemistry 30:  
Unit 6: Redox Reactions and Electrochemistry