

## Physics 112

Monday, January 11/16

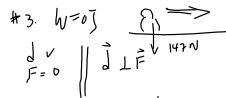
<http://mvhs-sherrard.weebly.com/>  
Textbook - ISBN

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1. Return and Review -> Test - Unit 3
  2. Exam - Review Problems (84)
  3. Wave Behaviors - Continue
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Test - U3 P1 \* ref. level.  $E_g = 0$

#1.  $E_{ki} + E_{gi} + E_{ci} = E_{kf} + E_{gf} + E_{cf}$   
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$   
 $v_i? \quad h_i? \quad x_i? \quad v_f? \quad h_f? \quad x_f?$   
 $E_{ki} = E_{kf} + E_{gf}$   
 $2 \left( \frac{1}{2} m v_i \right)^2 = \left( \frac{1}{2} m v_f \right)^2 + \rho g h_f$   
 $h_f = 0.79 \text{ m}$

2.  $v_i = 20 \text{ m/s}$   
 $v_f = 32.8 \text{ m/s}$   
 $m = ?$   
 $W = Fd$   
 $W = \Delta E_k$   
 $W = E_{kf} - E_{ki}$   
 $W = \frac{1}{2} m v_f^2 - \frac{1}{2} m v_i^2$   
 $W = m \left( \frac{1}{2} v_f^2 - \frac{1}{2} v_i^2 \right)$   
 $m = \frac{W}{\frac{1}{2} v_f^2 - \frac{1}{2} v_i^2}$   
 $m = 1.5 \times 10^3 \text{ kg}$



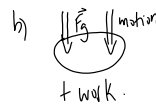
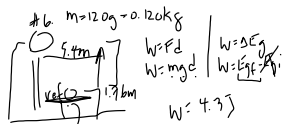
#4.  $E_i = 6.38 \times 10^5 \text{ J}$   
 $E_f = 2.09 \text{ J}$   
 $E_0 = ?$   
 $E_{ff} = E_i$   
 $E_0 = E_{ff} - E_i$   
 $E_0 = \frac{E_{ff} \cdot E_i}{100 \text{ J}}$   
 $E_0 = 1.26 \times 10^5 \text{ J}$

#5.  $m = 2.66 \times 10^4 \text{ kg}$   
 a)  $t = ? \text{ (h)}$   
 $P = 375 \times 10^3 \text{ W}$   
 $v = \text{constant}$   
 $d = 2.00 \times 10^3 \text{ m}$   
 $P = \frac{W}{t}$   
 $P = \frac{F \cdot d}{t}$   
 $P = \frac{m g d}{t}$   
 $t = \frac{m g d}{P}$   
 $t = 1.91 \times 10^5 \text{ s} = 38.8 \text{ h}$

or  $P = \frac{\Delta E_g}{t}$  (ref. level)  
 $P = \frac{E_{gf} - E_{gi}}{t}$  (original position)  
 $P = \frac{m g h_f}{t}$

b)  $3.75 \times 10^3 \text{ W} \times \frac{1 \text{ hp}}{746 \text{ W}} = 5.03 \text{ hp}$

c)  $P = \frac{W}{t}$   
 $P = \frac{m g d}{t}$   
 $P = m g v$   
 $[P = F v]$   
 $v = \frac{d}{t}$   
 $1.44 \times 10^3 \text{ m/s}$



7.   
 $E_e = 0.031 \text{ J}$   
 $F = ?$

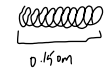
$x = 0.150 - 0.115$   
 $x = 0.035 \text{ m}$   
 $F = kx$   
 $E_e = \frac{1}{2} k x^2$   
 $k = 5.06 \text{ N/m}$   
 $F = 1.8 \text{ N}$

$\frac{1}{2} k x^2 = E_e$   
 $k = \frac{2 E_e}{x^2}$

Test Unit 3 - P3.

x1.  $v_i = 2.14 \text{ m/s}$   
 $v_f = 4.48 \text{ m/s}$   
 $W = Fd$   
 $W = \Delta E_k$   
 $W = E_{kf} - E_{ki}$   
 $\Delta W = \frac{1}{2} m v_f^2 - \frac{1}{2} m v_i^2$   
 $\Delta W = m \left( \frac{1}{2} v_f^2 - \frac{1}{2} v_i^2 \right)$   
 $m = 6.75 \text{ kg}$

x2. ref. level  $\rightarrow$  ground  
 $E_{ki} + E_{gi} + E_{fi} = E_{kf} + E_{gf} + E_{ff}$   
 $v_i = ?$   
 $h_i = ?$   
 $x_i = ?$   
 $E_{gi} = E_{kf} + E_{gf}$   
 $mgh_i = \frac{1}{2} m v_f^2 + mgh_f$   
 $v_f = 14 \text{ m/s}$

x3.   
 $x = 0.035 \text{ m}$   
 $E_c = 0.031 \text{ J}$   
 $E_c = \frac{1}{2} k x^2$   
 $k = \frac{2E_c}{x^2}$   
 $k = \frac{2 \cdot 0.031}{(0.035)^2}$   
 $k = 50.6 \text{ N/m}$   
 $F = kx$   
 $F = 1.8 \text{ N}$

x4.  $E_i$   
 $E_{ff}$   
 $E_o = ?$   
 $E_{ff} = E_o \times 100\%$   
 $E_o = \frac{E_{ff} \cdot E_i}{100\%}$   
 $E_o = 1.84 \times 10^{15} \text{ J}$

x5.  $\vec{F}$   
 $\vec{I}$   
 $W = 0 \text{ J}$

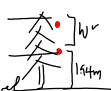
x6.  $P = 0.901 \text{ hp} \times \frac{746 \text{ W}}{1 \text{ hp}} = 672 \text{ W}$   
 $m = 362 \text{ kg}$   
 $d = 15.6 \text{ m}$   
 $t = ? \text{ (min)}$

$P = \frac{W}{t}$   
 $P = \frac{Fd}{t}$   
 $P = \frac{mgd}{t}$   
 $t = 82.45 = 1.37 \text{ min}$

$P = \frac{W}{t}$   
 $P = \frac{mg \cdot d}{t}$   
 $P = \frac{mg \cdot h \cdot f}{t}$

b)  $P = \frac{W}{t}$   
 $P = \frac{mgd}{t}$   
 $P = mgd$   
 $v = ?$

$d = -m$   
 $t = -s$   
 $v = \frac{d}{t}$   
 $v = 0.149 \text{ m/s}$

x7.   
 $m = 3.70 \text{ kg}$   
 $m = 0.00370 \text{ kg}$   
 $W = \Delta E_g$   
 $W = E_{gf} - E_{gi}$   
 $W = E_{gf} - mgh_i$   
 $E_{gf} = W + mgh_i$

# Physics 122

Monday, January 11/16

<http://mvhs-sherrard.weebly.com/>

## 1. Experiment 8.1 - Kepler's Laws -> 5 Days Late

Worksheets - *Planetary*

Text: Page 608, #1-4

Page 623, #23-27, 30

Text: Page 614, #5-8

Page 623, #28, 29

Worksheet - SHM

*] Mass on a Spring*

*] Pendulum*

## 2. Test - Unit 2 -> Horizontal Projectile

Projectile Fired At an Angle

Circular Motion, Banked/Unbanked

Planetary Motion

SHM - Mass on a Spring

Pendulum

\* Wednesday, Jan. 13/16

*} Problems only*

## 3. Review Problem

## 4. Unit 3 - Electrostatics and Electric Current

- Electric Charge

- Transfer of Charge

- Charging by Conduction and Induction

- Law of Conservation of Electric Charge

- Electric/Electrostatic Force

- Coulomb's Law

## 5. Handout: Charge and Coulomb's Law

Textbook: Page 638, #4-5

## P122 - Review #1 - Jan 11/16

Bubba Newton assembles a  $7.50 \times 10^3 \text{ N}$  spacecraft in his backyard. He accidentally launches the spacecraft. What is the weight of the spacecraft when it is located  $1.92 \times 10^7 \text{ m}$  from the center of the Earth?

Earth	Space
$W_E = 7.50 \times 10^3 \text{ N}$ $g_E = 9.80 \text{ m/s}^2$ $m_E = ?$ $W_E = m_E g_E$ $m_E = 765.3 \text{ kg} *$	$W_s = ?$ $r = 1.92 \times 10^7 \text{ m} \leftarrow$ $m_s = 765.3 \text{ kg}$ $W_s = m_s g_s *$ $g_s = \frac{GM}{r^2} *$
$\boxed{W = F}$ weight force	$*F_s = \frac{G m_E m_s}{r^2}$

## Science 10

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

Monday, January 11/16

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1. Assignment: Oh, What a Tangled Web We Weave  
**2 Days Late**
  2. Return Marks -> Quiz - Ecology to Food Webs
  3. Article: Keeping Threatened Amphibian Species Afloat  
**- Pass in for Marking Today**
  4. Sustainability
  5. Types of Substances
  6. Cycling of Organic Matter
  7. Biogeochemical Cycles
  8. The Carbon Cycle - To Be Continued
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9. The Nitrogen Cycle
  10. The Oxygen Cycle
  11. Fertilizers and Their Effects on Ecosystems
  12. Paradigm Shifts