Science 10

Thursday, March 23/17

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1. Single Replacement Reactions
2. Double Replacement Reactions
3. Worksheet: SR and DR Reactions - To Be Continued
4. Assignment - Balancing Chemical Equations - Today

5. Combustion Reactions
6. Worksheet: Combustion Reactions

Physics 112

Thursday, March 23/17

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1. Check -> Worksheet - Motion Problems
   Worksheets (3) - Freely Falling Bodies

2. FA - Motion Problems

3. SA - U1: S2 & 3 -> Friday, March 24/17
   -> Velocity-Time Graph
   -> Motion Problems (4)

4. Concept Page - U2 - S1

5. Introduction to Forces

6. Force of Gravity

7. Practice Problems (PP) - C4 - Weight - Page 137: 1-4 - HW

8. Applied Force

9. Normal Force

10. Tension

11. Force of Friction

12. Free Body Diagrams (FBDs)

Formative Assessment - Motion Problem

A helicopter is ascending vertically with a speed of 5.00 m/s. At a height of 105 m above the ground, a package is dropped from a window. How much time does it take for the package to reach the ground?

Formative Assessment - Freely Falling Body

$\vec{v}_i = +5.00\ m/s$
$\vec{a} = -9.80\ m/s^2$
$\vec{d} = -105\ m$
$t = ?$

Solution 1

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

$-105 = 5.00t + \frac{1}{2}(-9.80)t^2$

$-105 = 5.00t - 4.90t^2$

$-4.90t^2 + 5.00t + 105 = 0$

$a \quad b \quad c$

$t = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$t = \frac{-(5.00) \pm \sqrt{(5.00)^2 - 4(-4.90)(105)}}{2(-4.90)}$

$t = \frac{-5.00 \pm \sqrt{2083}}{-9.80}$

$t = \frac{-5.00 \pm 45.64}{-9.80}$ ← keep extra digit

$t = 5.17\ s$ or $t = -4.15\ s$

It took 5.17 s.

Solution 2

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

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

$\vec{v}_f = \sqrt{(5.00)^2 + 2(-9.80)(-105)}$

$\vec{v}_f = -45.64\ m/s$

↑ keep an extra digit

⊖ because package is falling

$\vec{a} = \frac{\vec{v}_f - \vec{v}_i}{t}$

$t = \frac{\vec{v}_f - \vec{v}_i}{\vec{a}}$

$t = \frac{-45.64 - (5.00)}{-9.80}$

$t = 5.17\ s.$

It took 5.17 s.

Physics 122

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1. Intersection Problems
2. SA - Torque -> 30 minutes
3. Worksheets - Relative Velocity (5)