

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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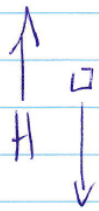
1. Check -> Worksheet - Motion Problems
Worksheets (3) - Freely Falling Bodies
2. FA - Motion Problems
3. SA - U1: S2 & 3 -> Friday, March 24/17
-> Velocity-Time Graph
-> Motion Problems (4)
4. Concept Page - U2 - S1
5. Introduction to Forces
6. Force of Gravity
7. Practice Problems (PP) - C4 - Weight - 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



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

Solution 1

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

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

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

$$\underbrace{-4.90t^2}_a + \underbrace{5.00t}_b + \underbrace{105}_c = 0$$

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

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

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

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

$$t = 5.17 \text{ s} \text{ or } t = -4.15 \text{ s}$$

If took 5.17 s.

Solution 2

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

$$\begin{aligned} \sqrt{\vec{v}_f^2} &= \sqrt{\vec{v}_i^2 + 2\vec{a}\vec{d}} \\ \vec{v}_f &= \sqrt{(5.00)^2 + 2(-9.80)(-105)} \end{aligned}$$

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

↑ keep an extra digit
⊖ because package is falling

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

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

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

$$t = 5.17 \text{ s.}$$

If took 5.17 s.

Physics 122

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1. Intersection Problems
2. SA - Torque -> 30 minutes

3. Worksheets - Relative Velocity (5)