Friday, September 27/13
Physics 112/111

ID Pictures: Sept. 25-26

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1. Quiz-> Unit 1: Section 1 -> Results Monday
   -> Rewrite Thursday

2. Kinematic Equations -> Continue

3. Worksheet: Motion-Problems -> HW: #9, 11, 15, 19-22, 24-25

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4. Freely Falling Bodies

Given: $ax^2 + bx + c = 0$

Quadratic Formula: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Example: Find the roots of $6x^2 + 6x - 36 = 0$. $x = -3$ or $x = 2$

$x^2 + x - 6 = 0$

$(x - 2)(x + 3) = 0$

$x = 2 \quad x = -3$

$1x^2 + 1x - 6 = 0$

$ax^2 + bx + c = 0$

$a = 1$, $b = 1$, $c = -6$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \dfrac{-1 \pm \sqrt{(1)^2 - 4(1)(-6)}}{2(1)}$

$x = \dfrac{-1 \pm \sqrt{25}}{2}$

$x = \dfrac{-1 \pm 5}{2}$

$x = \dfrac{-1+5}{2}$ or $x = \dfrac{-1-5}{2}$

$x = 2 \qquad x = -3$

The quadratic formula may be useful in some motion problems:

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

$\frac{1}{2}\vec{a}t^2 + \vec{v}_i t - \vec{d} = 0$

$ax^2 + bx + c = 0$

$a =$

$b =$ > quadratic formula

$c =$

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Kinematic Equations

Uniform motion

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

Uniformly acc'd

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

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

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

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

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

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