Review-Test #1

1. base units: m, kg, s
derived units: $\frac{m}{s}$, $\frac{m}{s^2}$, N, $\frac{kg\,m}{s}$, Ns
↓
$\frac{kg\,m}{s^2}$

2. Formulas:

uniform motion	uniformly accelerated motion	
$\vec{v} = \frac{\vec{d}}{t}$	$\vec{v}_f = \vec{v}_i + \vec{a}t$	$\vec{p} = m\vec{v}$ uniform motion
	$\vec{d} = \frac{1}{2}(\vec{v}_i + \vec{v}_f)t$	$\vec{J} = \Delta\vec{p}$
	$\vec{d} = \vec{v}_i t + \frac{1}{2}\vec{a}t^2$	$\vec{J} = \vec{F}t$
	$\vec{v}_f^2 = \vec{v}_i^2 + 2\vec{a}\vec{d}$	$\vec{J} = m\vec{v}_f - m\vec{v}_i$
		$\vec{F}t = m\vec{v}_f - m\vec{v}_i$ uniformly acc'd motion

Velocity-Time Graph
① $\vec{a}$ = slope = $\frac{\Delta\vec{v}}{\Delta t}$
② $A = \frac{1}{2}bh$, $A = bh$, $A = \frac{1}{2}(a+b)h$

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

3. Symbols and Notation
$a = 9.80\,m/s^2$
$\vec{a} = -9.80\,m/s^2$

4. Vectors vs. Scalars

Vectors	Scalars
$\vec{v}$	m
$\vec{a}$	t
$\vec{F}$	v
$\vec{p}$	d
$\vec{J}$	
$\vec{d}$	

⇒ Level + Component

SOHCAHTOA

5. Analytical + Graphical Analysis of Vectors

Analytical	Graphical
sketch	scale 1 cm = ___
labels SD	labels ($\vec{A}$, $\vec{B}$, $\vec{R}$, °)
arrows	arrows
$\vec{R}$ = ___, ___	$\vec{R}$ = ___, ___ 10 m/s 24° N of W

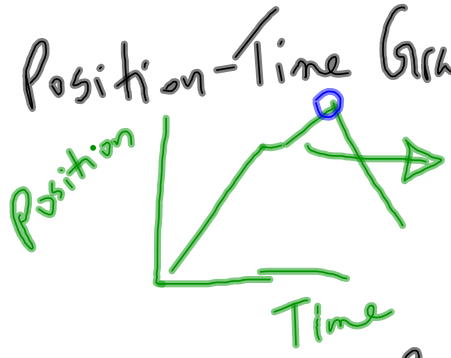
6. Rearranging Formulas

7. Freely Falling Bodies.

$\vec{a} = -9.80\ m/s^2$

8. Definition of physics!

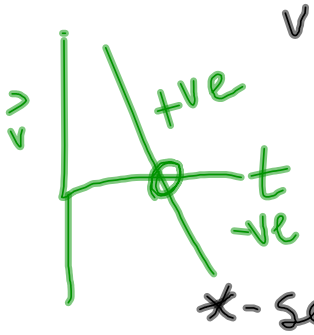
9. Position-Time Graphs



$\vec{m} = \vec{V} = \frac{\Delta \vec{x}}{\Delta t} \Rightarrow \frac{m}{s}$

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

10. Velocity-Time Graphs
$\vec{v}$, t, $\vec{a}$ (slope), $\vec{d}$ (areas)



$d = A_1 + A_2$

$d = A_1 + (-A_2)$

*-see graphing exercises

11. SD's + scientific notation

ie/ $345.3\ kg$

$2.5 \times 10^2\ kg$

12. prefixes $1\ kg = 10^3\ g$

$1\ ms = 10^{-3}\ s$

$1\ km = 10^3\ m$

* $\frac{km}{h} \xrightarrow{\div 3.6} \frac{m}{s}$ $\frac{m}{s} \xrightarrow{\times 3.6} \frac{km}{h}$

$200\ \frac{km}{h} \times \frac{1\,h}{3600\,s} \times \frac{10^3\,m}{1\,km}$

$\frac{200}{3600}$ $\div 3.6$

13. Kinematics, dynamics

"how" (why)

14. Frames of reference

moving or stationary.

* Notes: Impulse + Momentum

① time: ms

$10.0\,ms \times \frac{10^{-3}\,s}{1\,ms} = \_\_\_\_\,s$

② units:

$t \rightarrow s$	$\vec{F} \rightarrow N$
$m \rightarrow kg$	$\vec{J} \rightarrow Ns$ or $kg\frac{m}{s}$
$\vec{v} \rightarrow m/s$	$\vec{p} \rightarrow kg\frac{m}{s}$

③ change in momentum $\vec{\Delta p}$

$\vec{\Delta p} = \vec{p_f} - \vec{p_i}$

$\vec{\Delta p} = m\vec{v_f} - m\vec{v_i}$ ⇐

④ $\vec{F}t = m(\vec{v_f} - \vec{v_i})$

impulse = change in momentum

$\vec{v_f} = ?$

$\vec{F}t = m(\vec{v_f} - \vec{v_i})$ ÷ x

$\frac{\vec{F}t}{m} = \vec{v_f} - \vec{v_i}$

$\frac{\vec{F}t}{m} + \vec{v_i} = \vec{v_f}$

⑤ Check directions!!!

$\vec{v_i}$ +ve

$\vec{v_f}$ -ve