September 9, 2016 Physics 131 Prof. E. F. Redish

- **Theme Music:** **The Ventures**
  Walk Don't Run
- **Cartoon:** **Jef Mallet**
  Frazz

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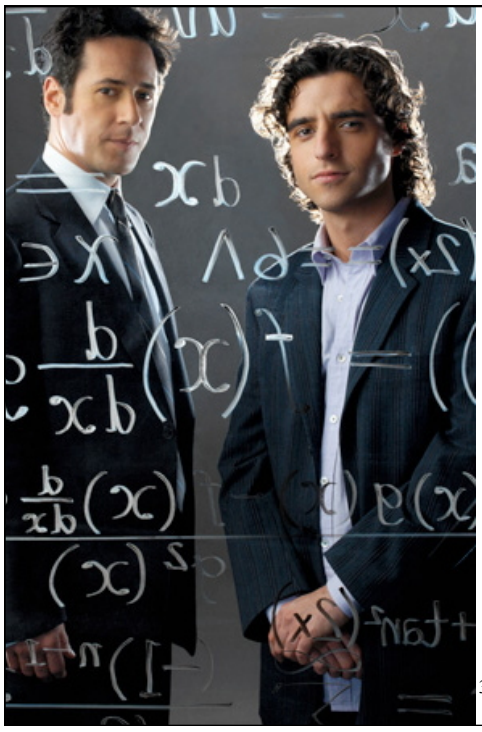

The Equation of the Day

The derivative and the integral

$$v = \frac{dx}{dt}$$

$$\Delta x = \int v(t)\,dt$$

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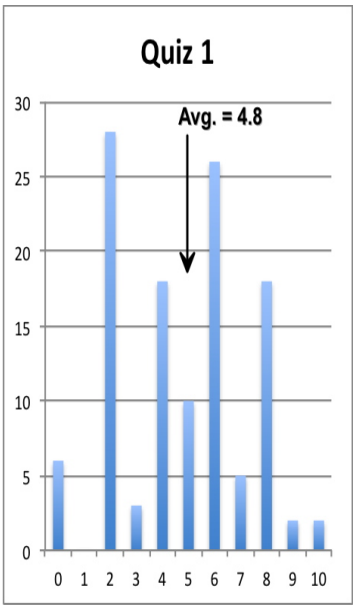
Quiz 1

	1a	1b	1c		2		3
α	13%	**78%**	9%	**10**	**15%**	**Pokemon**	**56%**
β	34%	5%	**32%**	**0.1**	7%	**pineapple**	7%
γ	**40%**	5%	21%	**5**	5%		
δ	8%	11%	33%	**0.2**	0%		



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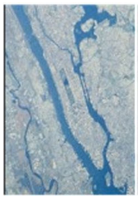
Multiple Representations

- We choose different ways of representing things depending on what we want to do.



- Adding multiple sensory modes adds to our sense of an object's reality.

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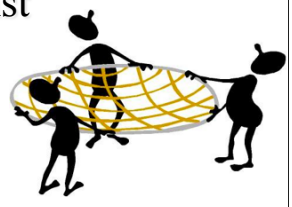
Knowing-how-to-know icon: Multiple Representations

- We have many different ways that we represent information:
  - Words
  - Equations
  - Diagrams
  - Pictures

- Each gives its own way of building up something "real" in our minds.

Knowing-how-to-know icon: Coherence – Your safety net

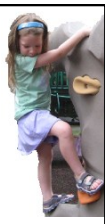
- Throughout the class we will be looking to see physical situations in a variety of different ways.
- The consistency among the different views protects us against errors of reconstructed memory.



What's the difference between the x vs. y graph and the x and y vs. t graphs

- "Graphs for the eye vs. graphs for the mind."
- The 3 different graphs each give us different information about the same physical system.

Foothold ideas: Velocity



- Average velocity is defined by

$$\langle \vec{v} \rangle = \frac{\Delta \vec{r}}{\Delta t} = \frac{\text{vector displacement}}{\text{time it took to do it}}$$

Note: an average velocity goes with a time interval.

- Instantaneous velocity is what we get when we consider a very small time interval (compared to times we care about)

$$\vec{v} = \frac{d\vec{r}}{dt}$$

Note: an instantaneous velocity goes with a specific time.