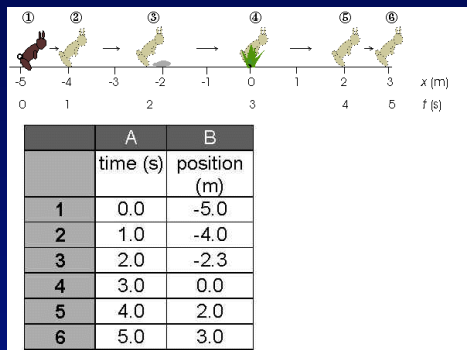# Physics 1021

Spring 2012
LoggerPro analysis of data

Ponderable: Running Rabbit

Imagine we have taken position-time data for a running rabbit.

	A	B
	time (s)	position (m)
1	0.0	-5.0
2	1.0	-4.0
3	2.0	-2.3
4	3.0	0.0
5	4.0	2.0
6	5.0	3.0

•Start Logger Pro on your computer and type the data into Logger Pro.
•Graph the points and then fit a curve to the data (Analyze >> curve fit). Try successively higher polynomials until the data are well fit, but no higher.
•From the fit, determine the velocity and acceleration as a function of time. Graph and discuss. Does the rabbit hop?
Hint: If you select create calculate column in the Curve Fit box, you will get a new data column with the computed Y-values, and you will have access to the coefficients of the polynomial fit. Use these you to calulate v and a.

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Phys 21: chap 1, Pg 2

Ponderable: Velocity graph

•Sketch the velocity graph associated with this acceleration graph:
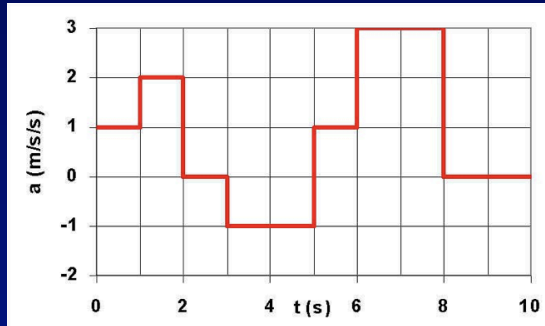
•Assuming that the initial velocity is zero, how far does the object travel?
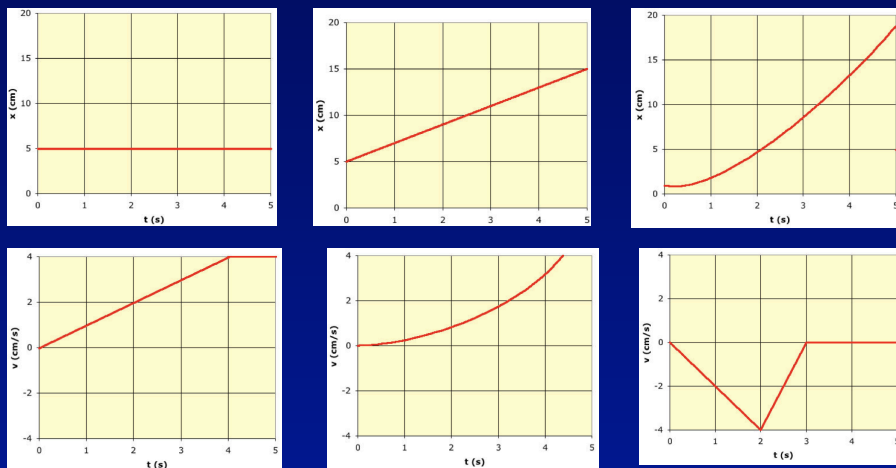•Write an equation for the position as a function of time:
  •Between t = 0 and 1 s
  •Between t = 1 and 2 s
  •Between t = 2 and 3 s

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Tangible: Hand-waving exercise

•The graphs below are plots of position and velocity vs. time. With your partners, move your hands to simulate the data in the graphs.
•For each graph, there should be a handwaver, a skeptic, and a scribe (to describe the motion). Label each description with the graph number and a sketch of the graph. Rotate roles after each graph.How well can you do this?
•Film yourself for graphs on the bottom row to analyze the videos with loggerpro.

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