

Introduction

“One of the biggest problems is how to state the problem. It's an old saying that the minute you can state a problem correctly you understand 90 percent of the problem.”

-- John A. Wheeler (physicist)

Announcements (repeats):

- Tutorials begin this week
 - Bring the **Student Workbook**
 - This Friday's office hour cancelled
 - Your MasteringPhysics average score is incorrect.
 - We will adjust at the end of the year
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About MasteringPhysics

- Late last week Rogers began blocking access to MasteringPhysics
 - It was unblocked yesterday morning.
 - Deadline for Pre-Class Quiz 1:
 - Extended from last Monday at 10 AM to this Friday, Sept 23, at 10 AM.
 - Deadline for MP Problem Set 1:
 - Extended from this Friday at 5 PM to Monday, Sept. 26 at 5 PM.
 - Pre-Class Quiz 2 is still due this Monday, Sept. 26 by 10 AM.
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Introducing Xiaolu (Lulu) Yu:

- When you have a question in class:
 - Write it on a piece of paper
 - Raise your hand
 - Lulu will come to get the paper, and will bring it to me.
 - She will not climb up into the balconies.
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Last Time 1/2

- Acceleration
 - Motion Diagrams again
 - Problem Solving
 - Position-Time Graphs
 - Instantaneous and Average:
 - Velocity
 - Acceleration
 - Classical Physics assumes: the world is continuous
-

Last Time 2/2

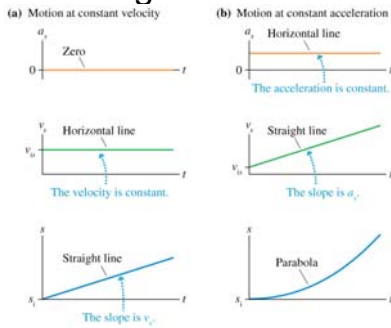
$\vec{x} = \vec{f}(t)$

$\vec{v} = \frac{d\vec{x}}{dt} = \vec{g}(t)$

$\vec{a} = \frac{d\vec{v}}{dt} = \frac{d^2\vec{x}}{dt^2} = \vec{h}(t)$

Slopes - Derivatives Areas - Integrals

Figure 2.29



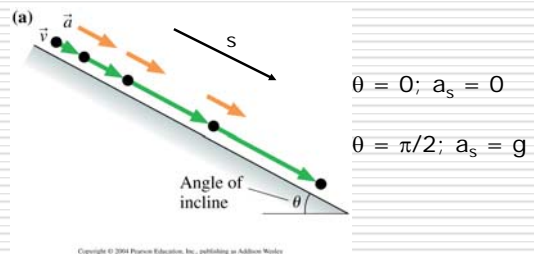
Today

- Finish Chapter 2
- Chapter 3: Vectors and Coordinate Systems
- Begin Chapter 4: Force and Motion
 - Finish?

Assumptions of Classical Physics

- The world is mechanistic, a "clockwork"
- It is describable by *Laws*
- The Laws are mathematical
- The world is continuous

Figure 2.36 (a)



Vectors

- Specified by magnitude & direction
 - Also specified by Cartesian components: A_x, A_y, A_z
 - Not specified by where it is
- Addition:
 - Commutative
 - Associative
 - Add Cartesian components
- Unit vectors:

$$\vec{A} = A_x \hat{i} + A_y \hat{j} + A_z \hat{k}$$

Force

- Is roughly a push or a pull.
- Acts on an object.
- Requires an *agent*.
- Is a vector.
- Is either:
 - A contact force.
 - A long-range force.

Figure 4.16

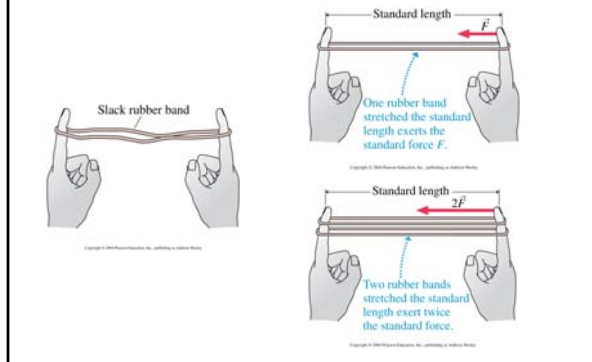


Figure 4.18

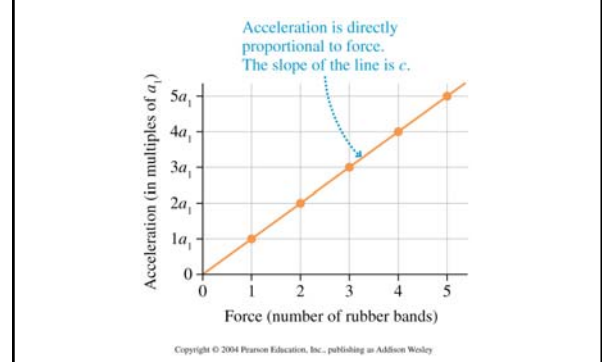


Figure 4.19

