Lecture 9: Static Special Cases

<u>Warm-Up Activity</u>
Question?

(A) Answer?

In-Class Quizzes on Monday

- Two quizzes: Motion and Forces.

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L9-1: Textbook on a Tilted Table

A physics textbook is on a tilted, frictionless table, supported by a string.

(A) Sketch a free-body diagram for the system.

(B) What coordinate system do you think will make analyzing this situation easiest?

(C) Should the net force on the book be *zero* or *not zero*?

(D) Write an expression for the magnitude of each force acting on the system in terms of the gravitational force F^g.
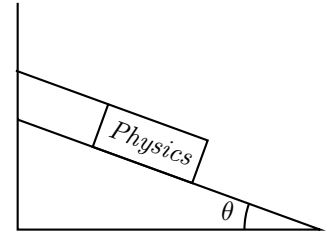
Special-Case Analysis

After you solve for a quantity:

- Choose a case that is special, not arbitrary.

- Figure out what your quantity **should** be in the case you chose.

- Identify the value of one or more other quantities that corresponds to your **case**.

- Evaluate your answer in the special case.

- Check whether or not your symbolic answer for the case matches what you expected the answer should be.

L9-2: Tilted Table Sensemaking

A physics textbook is on a tilted, frictionless table, supported by a string.

- Suppose the table is slanted so that it becomes *steeper*. What happens to the magnitudes of the normal force and the tension force?

- Consider the following special cases:

  - What if the table were horizontal?
  - What if the table were vertical?
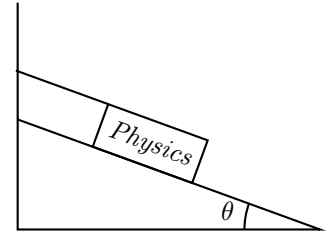
  For each of these cases, answer the following questions:

  - How big **should** each force be?
  - What angle corresponds to this **case**?
  - Does our symbolic answer for the case match what the answer should be?

Main Ideas

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