Due Jan. 24, Friday

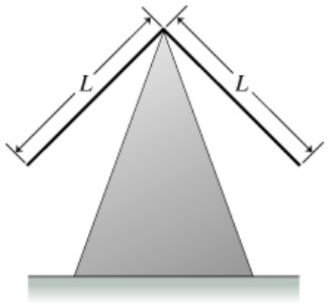
All problems must be solved symbolically first. Then, any numerical answer, when required, can be computed by substituting numbers into the symbolic expression at/near the very end. Solving problems symbolically means deriving the answer in terms of symbols, instead of numerical values. All problem numbers refer to those in the textbook. (Not all problems may be graded in detail, due to limited man power; however, you must do all problems.)

For each problem, you are required to use sensible symbols, by defining or adopting them yourself, for your symbolic solution. If you are unsure how to do so, feel free to ask (or look back at homework 1)!

Problem 1 (10 points) Problem 14.43 (simple pendulum).

Problem 2 (10 points; extra credit) Problem 14.58 (physical pendulum).

Problem 3 (10 points) Two identical thin rods, each of mass m and length L, are joined at right angles to form an L-shaped object. This object is balanced on top of a sharp object. If the object is displaced slightly, it oscillates. Assume that the magnitude of the acceleration due to gravity is g. Find the angular frequency ω.



Problem 4 (10 points) Problem 15.12 (string wave)

Problem 5 (10 points) Problem 15.26 (wave; dealing with multi-variable function)

Problem 6 (10 points) Problem 15.29 (wave; basics)

Problem 7 (10 points; extra credit) Problem 15.31 (wave equation)

Problem 8 (10 points) Problem 15.34 (wave equation; linearity and superposition)

Problem 9 (10 points) Problem 15.37 (wave propagating in inhomogeneous media)

Problem 10 (10 points) Problem 15.75 (wave; energy)