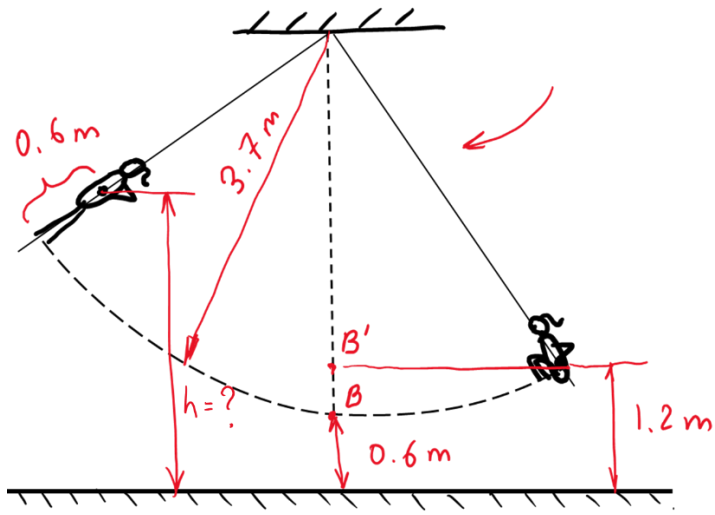
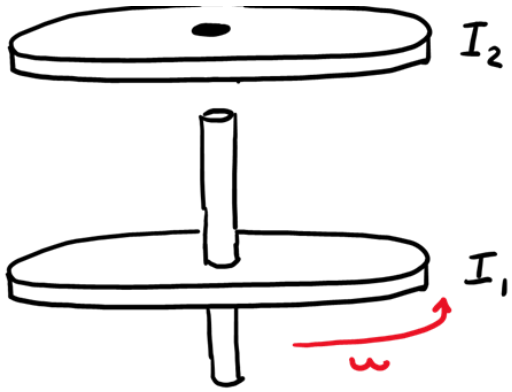
Homework 12

Problem 1.

Assume that the center of mass of a girl crouching in a light swing has been raised to 1.2m. The girl weighs 400N and her center of mass is 3.7m from the pivot of the swing while she is in the crouched position. The swing is released from rest and at the bottom of the arc the girl stands up instantaneously, thus raising her center of mass 0.6m (returning to its original level). Find the height of her center of mass *h* at the top of the arc.



Problem 2.

The lower disc is coasting with angular speed ω_1. The combined moment of inertia of it and its axle is I_1. A second disc of moment of inertia I_2 is dropped onto the first and ends up rotating with it. Find the angular velocity of the combination if the original angular velocity of the upper disc was:

a) Zero
b) ω_2 in the same direction as ω_1
c) ω_2 in a direction opposite to ω_1