Week HW 6, COM LINEAR ANGULAR

Motion of the centre of mass of a system
Change of Principal Angular momentum of a system

Task 1

There are 3 weights with masses $M_1 = 20$ kg, $M_2 = 15$ kg, $M_3 = 10$ kg. The mass of body $ABCD$ is $M = 100$ kg. $M_{1,2,3}$ are connected by ideal string. This string go through by two pulleys L, N. When the M_1 weight goes down on 1 $meter$, the body $ABCD$ shifts on some distance S.

The task is to find the distance of this movement according to the ground. Neglect the friction between the floor and $ABCD$.

Answer: It will move to the left on 14 cm.
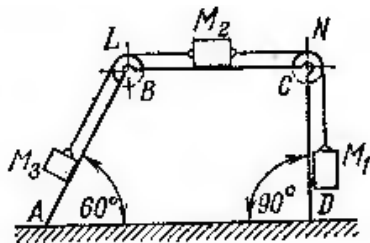

Task 1

Task 2

On the figure a pulley with a rope running over it is presented. A man (mass m) holds one side of the rope at A while a load, equal to the weight of the man, is attached to the other end of the rope at B.

What would happen to the load if the man starts climbing up the rope with the velocity a relative to the rope. The weight of the pulley is equal 0.25. The mass of the pulley is distributed uniformly along its rim.

Answer: The load will ascend with velocity $-\dfrac{4}{9}a$.
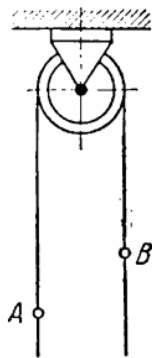
Task 2

Deserve "A" grade!

– Oleg Bulichev

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🚪 Room 105 (Underground robotics lab)