

Homework 8

Below are 2 rather difficult problems for the homework:

1. If you hit a stone with a long uniform stick in such a way that the impact point is close to your hand (Fig 1a) it will be sensitive.

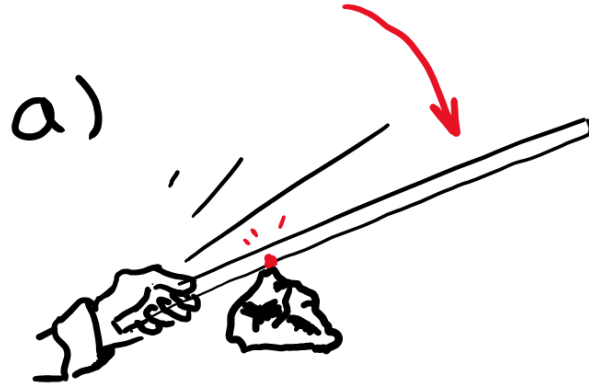


Figure 1a

It will also be sensitive if the impact point is close to the end (Fig 1b):

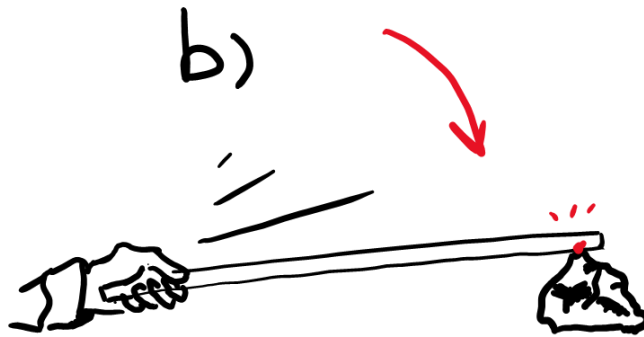


Figure 1b.

But there is a special impact point: if the stick collides with the stone at this point it will not be painful for your hand. Find this point. Consider the rod motion as rotation with the center at the rod “handle”.

2. A thin uniform rod of length L and mass m is balanced in a vertical position on a frictionless horizontal tabletop. Then you slightly touch the upper end of the rod and it falls. Find the velocity of the upper end of the rod at the moment it hits the ground.