Circular Disk A CD is rotated about an axis O through its center by the application of two forces. Annie and Mikey are fighting over the CD. Annie pushes with a finger and applies a force of magnitude $11N$ is exerted at a distance of $0.34cm$ from the axis and at an angle of $58°$ from a radial line extending from the axis through the point of application A of the force. Mikey applies a second force of magnitude $15N$ is exerted at a distance of $0.26cm$ from the axis and at an angle of $119°$ from a radial line extending from the axis through the point of application M of the force. Determine the net torque on the CD about its center and which way the net torque accelerates the CD.

Tipping Rod Stephanie is playing with a $15g$ meter stick. She balances it on her arm. She then places four weights on it. She puts the first, a $20g$ weight at the $30cm$ mark. The second, a $2g$ weight at the $2cm$ mark. The third, a $6g$ weight at the $40cm$ mark. She places the last weight at the $90cm$ mark. The meter stick remains balanced. How large (in grams) is the last weight?

[0]Select problems may be modified from Walsh, Harrison, or the Internet.

Kinematics Algorithm For homework and exams you get points for doing these things. So today you must label each of these 9 steps with your work. Anything in bold is my addition to the normal algorithm and should also be done.

1. Read and re-read the whole problem carefully. **Read it aloud as a group.**
2. Visualize the scenario. Mentally try to understand what the object is doing. **Physically act it out.**

   Draw a picture of what this would look like in the real world.
3. Draw a physical representation of the scenario; include initial and final velocity vectors, acceleration vectors, position vectors, and displacement vectors. **This isn't what things actually look like- this is a simplified version that has physics on it.**
4. Define a coordinate system; place the origin on the physical representation where you want the zero location of the x and y components of position.
5. Identify and write down the knowns and unknowns.
6. Identify and write down any connecting pieces of information.
7. Determine which angular kinematic equation(s) will provide you with the proper ratio of equations to number of unknowns; you need at least the same number of unique equations as unknowns to be able to solve for an unknown. **Don't forget the useful other equations!**
8. Carry out the algebraic process of solving the equation(s). **I require that you have units on every number and carry them through the calculations.**

   If simple, desired unknown can be directly solved for.

   May have to solve for intermediate unknown to solve for desired known.

   May have to solve multiple equations and multiple unknowns.

   May have to refer to the geometry to create another equation.

   If multiple objects or constant acceleration stages or dimensions, there is a set of kinematic equations for each. Something will connect them.
9. Evaluate your answer, make sure units are correct and the results are within reason. **Make sure the units that cancel out from the calculations match the ones you expect physically.**