Moment Lab:

Upon loading *Moment Lab*, by clicking on *MomentLab* in the submenu *Labs*, the following two windows should appear. The top window, or *Moment Lab* window, will contain the numerical data pertaining to the moments generated when the user clicks on the *Start* button. The bottom window, or *Moment Plot* window, will contain the graphical data.

When the user is ready to start, he should click on the *Start* button in the *Moment Lab* window. This will generate 2 forces with moment arms. Thus, the forces will create torque.

The goal is to create a moment or torque on the rod that will balance the other moments. This can be done

in two ways. First, using the numerical data from the *Moment Lab* window, the user can calculate how much torque is needed to balance the other moments. The balancing moment can then be entered into the *Balancing Moment* box.

The second way to balance the torques is intuitively. The user can look at the *Moment Plot* and then attempt to balance the moments by clicking a balancing moment on to the rod using the mouse. The result can be seen below. If the user wishes to change a balancing moment on the screen, then the user should just click where the moment should be. The old moment will be deleted, and a new one will be created.

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The angle between the forces and the rod are measured from the rod in a counterclockwise direction. The forces above the rod will have angles between 0 and π radians, and the forces on the bottom of the rod will have angles between π and 2π radians.

The user has the option to use 2, 3, or 4 moments. When more than two moments are used, the *Moment*

Lab window will resize.

Further, the user has the option of using *Moment Lab* at the *Beginner* or *Advanced* level. The beginning level generates forces that are perpendicular to the rod, and the advanced level generates forces that are at any angle to the rod. The levels can be switched by clicking with the mouse on the button with the correct corresponding level.
The tolerance of application is ± 10 Newton-Meters. If the net torque is not within that tolerance, the rod will move.

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The user should keep in mind that moments of forces are the same as torques exerted by forces.