Force Lab:

After clicking on *ForceLab* in the submenu *Labs*, the following two windows should appear.   In the window labeled Force Lab, forces will be displayed numerically, and in the window labeled *Force Plot*, forces will be displayed graphically.   These forces are displayed in both windows when the user clicks on the start button in the *Force Lab* window.

The user must try to balance the forces generated by the application after he clicks on the *Start* button.   This can be done in two ways.   The user can calculate numerically from the data given in the *Force Lab* window what the balancing force should be, and then enter the balancing force into the box labeled *Balance Force*.   After entering the balancing force, the user should then click with the mouse on the Compute button to see if the answer is within the tolerance levels($\pm$ 0.5 N).   If the answer is within the tolerance level, the application will inform the user.   Otherwise, the ring in the *Force Plot* window will move.

The second way the user can balance the forces is by dragging copies of the forces and placing them head to tail to using graphical vector addition to determine the balancing force.   This is done by clicking on the desired force.   Without letting the mouse button up, drag the force to where it should be placed.   After doing this with all the forces, the balancing force can be clicked on to the view at the point where the head should be.   To check

accuracy, the user can also drag a copy of the balancing force in the same way that the other forces were copied and dragged.   If the user wishes to change the balancing force, he should click on the tip of the head of the balancing force and drag it to where it should be located.   The size of the balancing force can be changed while it is being moved.   When satisfied with the balancing force, click on the *Compute* button.

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The user should keep in mind that any black force can be copied.   If the force is gray, the user can select and cut it.   Dragging the cursor across the peg while resizing the balancing force will cause application to destroy the balance force because the peg is in the very center of the ring.   The user will be prompted about this action.

The user has the option of using 2, 3, or 4 forces.   The number of forces the user uses can be changed by clicking on one of the appropriately labeled radio buttons in the *Force Lab* window.   When the user changes the number of forces to be used, all of the currently existing forces are destroyed in the *Force Lab* and *Force Plot* windows.   The first time more than two forces are selected, the *Force Lab* window will resize as seen below.

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