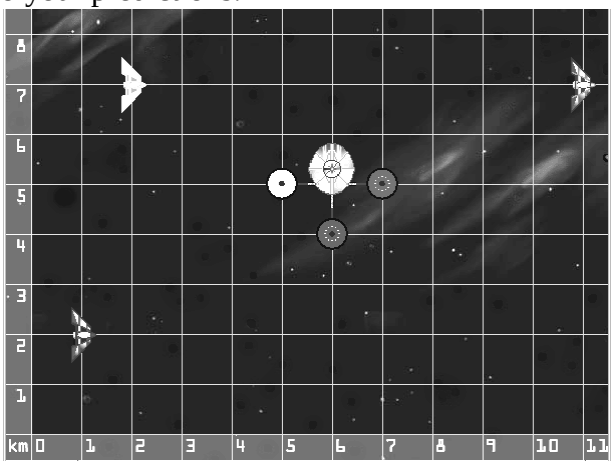
Open the shortcut **IL Vectors BtB** on one of the lab stations.
Open the simulation contained in this section. **Do Not follow the directions in the simulation follow the following instructions.**

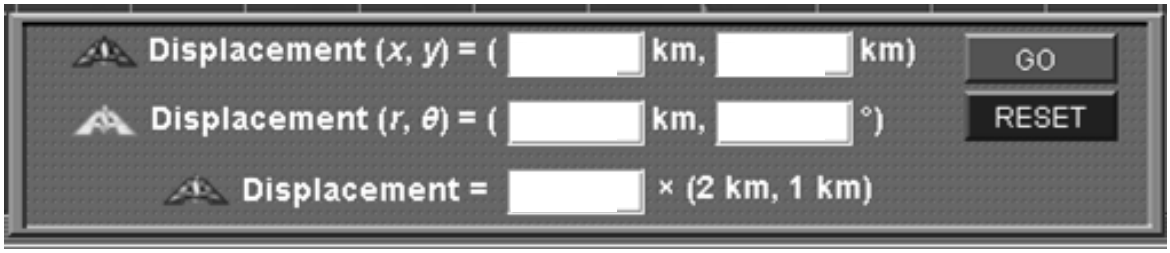
In the simulation, three spaceships need to reach their respective docking stations. (The red ship docks at the red station, the yellow ship at the yellow station and so on.) Your goal is to get them all home by calculating and entering the displacements from each of the ships to the corresponding stations.

For each of the ships you need to use a different way of describing the displacement vector. The red ship's displacement is specified with rectangular coordinates. The yellow ship must be specified with polar notation. And the purple ship's displacement is some scalar multiple of (2 km, 1 km). You need to calculate and enter the appropriate scalar value.

There is a grid on the drawing to help you determine the displacements. Each of the ships and docks is at the intersection of two grid lines. Each square on the grid is one kilometer across in each direction.

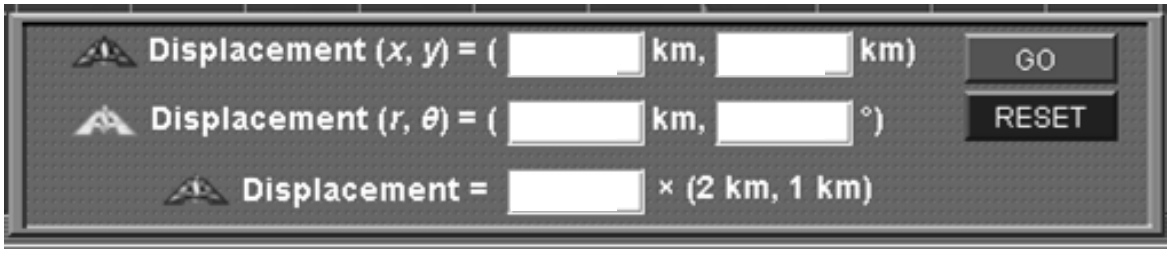
1. Before entering values predict what will work for each ship and record your prediction here. Show any thoughts or work you did to come to your predictions.





2. Test your predictions using the simulation. Did they work? **Y N**
(If they did not work recalculate and try again.) Record all new trials here.

3. Record your final results.



4. Which one was the hardest to get to the base? Why?

5. What key concepts or ideas did you use to achieve your final results?