

Math 762 Homework Assignment, Due Thursday, February 14

Look at the following problems. If you see how to do either of them hand in what you can do next Tuesday, Feb. 12. If you are stuck, there will be hopefully instructive hints on Tuesday.

1. Let $G(p)$ be the following bar framework. G has six distinct vertices, where vertices 1, 2, 3 are connected to all the vertices 4, 5, 6 and these are the only members (bars). In other words, G is the complete bipartite graph $K_{3,3}$. The vertices p_1, p_2, p_3 lie on the negative x -axis, and the vertices p_4, p_5, p_6 lie on the positive x -axis. Show that $G(p)$ is globally rigid in the plane.
2. Let p_1, p_2, p_3, p_4 be points in the plane that form a convex quadrilateral.
 - a. Determine those positions for p_5 in the plane, where $G(p)$ is rigid in three-space, where $p = (p_1, p_2, p_3, p_4, p_5)$ and G is the bar graph joining vertex 5 with all the others as well as the bars of the quadrilateral on $(1, 2, 3, 4)$.
 - b. Determine those positions for p_5 in the interior of the quadrilateral, where $G(p)$ is globally rigid in the plane and G is the same as part a.