

Manager: _____ Research: _____

Secretary: _____ Reporter: _____

PLAIN LINES

Working in groups of four, decide on your roles first. Each group should turn in one Final Report at the beginning of the next class meeting. The Report consists of this page as a cover sheet and separate pages with calculations and answers.

The purpose of this project is to exercise our ability to visualize in three dimensions by exploring the relation between two lines. Consider two (infinite straight) lines, one containing the points

$$A_1 = (1, 2, 3) \text{ and } B_1 = (4, 5, 6)$$

and the other containing the points

$$A_2 = (7, 8, 10) \text{ and } B_2 = (1, 1, 1).$$

Problem 1 *Are these lines coplanar? That is, is there a plane that contains both lines? Justify your conclusion.*

Problem 2 *Find equations for two parallel planes so that each plane contains one of our lines.*

Problem 3 *If we consider the shortest possible line segment that joins one line to the other, then this segment will be perpendicular to both lines. Why?*

Problem 4 *Calculate the distance between the lines.*

