

Math 302, Section B1; February 5, 2003
Quiz 2 (with Solutions)

Problem 1.

Assume that the terms “point”, “line”, “space”, “plane”, “between”, “congruent” are undefined terms of the system.

a) For two distinct points A, B write a definition of a line segment \overline{AB} with endpoints A, B .

Solution. If A and B are two distinct points then the segment \overline{AB} consists of the points A and B and of all the points C such that C is between A and B .

b) For a plane P and a point A not on P write a definition of a half-space determined by A and P .

Solution 1.

The half-space determined by A and P consists of the point A , all points of P and all points C in the space such that the segment \overline{AC} does not contain any points on P .

Solution 2.

The half-space determined by A and P consists of the point A , all points of P and all points C in the space such that either C is between A and a point of P or A is between C and a point of P .

c) For two distinct points A, B in space write a definition of the sphere with center A passing through B .

Solution.

The sphere with center A passing through B consists of all points C in space such that the segment \overline{AC} is congruent to the segment \overline{AB} .