Name:

1. [1pts] Express the following line segment using a set of linear combinations:

A picture containing antenna, object

Description automatically generated

1. [3pts] Let a, b be real numbers. Consider the equation z = ax+by. Prove that there are two 3-vectors v1, v2 such that the set of points [x, y, z] satisfying the equation is exactly the set of linear combinations of v1 and v2. (Hint: Specify the vectors using formulas involving a, b.)
2. [3pts] Problem 3.8.5: Let a, b, c be real numbers. Consider the equation z = ax+by+c. Prove that there are three 3-vectors v0, v1, v2 such that the set of points [x, y, z] satisfying the equation is exactly {v0 + α1 v1 + α2 v2: α1 ∈ R, α2 ∈ R}
3. [3pts] Show that is a vector space.