Responses for the Reading Questions 5

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Homogeneous Systems of Equations

1 What is always true of the solution set for a homogeneous system of equations?

The solution set for a homogeneous system of equations will always be the zero vector.

2 Suppose a homogeneous system of equations has 13 variables and 8 equations. How many solutions will it have? Why?

It will have infinitely many solutions because

$$n - r > 0 \tag{1}$$

$$13 - 8 = 5 \tag{2}$$

$$5 > 0 \tag{3}$$

Thus, according to the definition of CSRN, there are infinitely many solutions for the system.

3 Describe, using only words, the null space of a matrix. (So in particular, do not use any symbols.)

The null space of matrix A is the set of all the vectors that are solutions to the homogeneous system of linear equations.