Solving Systems of Equations

These exercises accompany the Java applet "A System of Linear Equations."

Consider a system of equations written in the form $\begin{array}{l} ax+by=c \\ dx+ey=d \end{array}$, where *a*, *b*, *c*, *d*, *e*, and *f* are constants. We can solve this system using elimination of variables, graphing, or by performing row-operations to place the augmented matrix in reduced echelon form. Here we will focus on the later method.

Table 1 shows several systems of equations. Write the augmented matrix and perform row operations to obtain the reduced echelon form. Find the solution, and describe the geometric interpretation of each system. Sketching the lines of the system may be beneficial.

System of Equations	Solution and Type of Solution	Geometric Interpretation
$3x-y=4$ $2x+y=5$		
$2x-y=4$ $4x-2y=5$		
$2x-y=1$ $4x-2y=2$		

Table 1: Find the solution, and describe the geometric interpretation of each system.

Describe the structure of each augmented matrix when it is in reduced echelon form.

Is there a relationship between the structure of the augmented matrix in reduced echelon form and the type of solution?