

IV. H. Algebra: Six Connections for Systems of Equations

Six Connections for Systems of Equations

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The column headings are standard descriptions of systems of equations. The left-hand column lists issues related to solving these systems.

	Consistent and Independent	Consistent and Dependent	Inconsistent
What happens when solution by linear combination or substitution is attempted:	x or y equals a number	x and y both vanish; result looks like $0 = 0$ or $-2 = -2$	x and y both vanish; result looks like $0 = -17$ or $42 = 29$
What the solution set looks like:	$(x,y) = (1,-5)$	$\{ (x,y) \mid y = x + 1 \}$	$\emptyset$
What the graph looks like:	Intersecting lines	Same line	Parallel lines
How the equations appear:	Nothing unusual	$x + y = 2$ $3x + 3y = 6$	$x + y = 2$ $x + y = 3$
What happens when Cramer's Rule is applied:	Denominator $\neq 0$	Numerator and denominator $= 0$	Denominator only $= 0$
What happens when Gauss-Jordan is applied:	Coefficient matrix is row-equivalent to identity matrix	Entire row of zeroes appears <u>including</u> the constant term	Entire row of zeroes appears <u>except</u> the constant term