2-Variable Equations & Inequalities

**Formula Sheet**

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| **Name** | **Definition** | **Formula** |
| Slope-Intercept Form of a Linear Equation | The slope-intercept form is a way of writing an equation in a form that identifies the slope and y-intercept.  | For example: $$y=2x+4 $$ |
| Standard Form of a Linear Equation | The standard form is the typical form that a linear equation is represented. This form makes the elimination and other methods simpler. | $$Ax+By=C $$For example: $$8x+6y=8 $$ |
| Quadratic Equation | A quadratic equation is a two-degree polynomial that creates a parabola when graphed. It can be written in a standard form.  | $$ax^{2}+bx+c=0$$When represented in a system: $$y=ax^{2}+bx+c$$ |
| Intercepts | The *x-* and *y-*intercepts of a graph can be found where a line crosses the *x-* and *y* axes. | The *x-*intercept is where the line crosses the *x-*axis. The *y-*intercept is where the line crosses the *y-*axis. |
| Inequality Symbols | Two expressions can be compared in an inequality, which is a mathematical statement that uses symbols.  |  |
| Graphs of Linear Inequalities | Depending on the inequality symbol used will determine what the graph of a linear inequality looks like.  |

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| **Inequality Symbol** | **Boundary Line** | **Shading** |
| >  | dashed line | shade above |
| ≥ | solid line | shade above |
| < | dashed line | shade below |
| ≤ | solid line | shade below |

* Dashed line: points on the line are NOT included in the solution set
* Solid line: points on the line are included in the solution set
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| Solutions of Systems of Equations | Systems of equations can have one, zero, or infinite solutions.  |

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| **Solutions** | **Graphed Features** |
| One Solution | Lines will intersect at a shared point of intersection.  |
| Infinite Solution | The system creates the exact same line, making the graph look like it is just one line. |
| None or Zero Solutions | The system creates parallel lines (same slope, different intercepts) that never cross. |

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| Solutions of Systems of Inequalities | The solution to a system of inequalities is defined by the overlapping shaded regions of their solution sets when graphed. All points within the overlapping area on a graph must satisfy both equations in a system of inequalities, in other words, this region shows their shared solutions.  | For example, the two inequalities overlap in the shaded purple region. This region represents the solution set for the system. |