Modeling with Algebra

**Formula Sheet**

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| **Name** | **Definition** | **Formula** |
| Linear Function | A linear function shows a constant rate of change between two variables. Its graph is a straight line. | * *m* = slope (rate of change) * *b* = *y*-intercept (starting value) |
| Slope Formula | Slope tells you how steep a line is. It shows how much y changes for every change in x. | * and are two points on the line * *m* = slope |
| Arithmetic Sequence Formulas | An arithmetic sequence is a list of numbers where you add the same value each time. | * Explicit Formula: * Recursive Formula: ,   \*Written as a function: |
| Geometric Sequence Formulas | A geometric sequence is a list of numbers where you multiply by the same value each time. | * Explicit Formula: * Recursive Formula: ,   \*Written as a function: |
| Quadratic Function` | A quadratic function models a curved pattern (called a parabola). It has one squared variable and changes direction once. | Standard Form:   * *a* = controls the direction and width of the parabola * *b* = affects the position of the vertex * *c* = y-intercept (starting value when x=0)   Vertex Form:   * *(h,k)* = vertex of the parabola * *a* = controls the opening direction and stretch |
| Exponential Function | An exponential function grows or decays quickly. The variable is in the exponent, not the base. | * *a* = starting value * *b* = growth (if *b>1*) or decay (if *0<b<1*) factor * *x* = number of time periods or steps |
| Scatterplot | A scatterplot is a graph that shows points based on two variables. It helps you see patterns, trends, or relationships between the variables. |  |