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Functions

Functions are the foundation for algebra. A function is a relationship between two variables. In algebra we have learned how to identify functional relationships and describe the relationships given attributes of the function.

When writing your song – consider the following vocabulary and phrases.

Independent Variable/Dependent Variable

Types of Correlations & Scatterplots (Positive, Negative, No Correlation)

Vertical Line Test

In a functional relationship the x's don't repeat

Domain & Range

Function Notation - F(x)

Coordinate Point (x, y)

Multiple Representations (Point, Table, Map, Graph, Equation, Verbal Description)

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Linear Relations

In algebra 1 we have spent a lot of time discussing linear relationships and graphs. We learned how to graph and interpret slope and y-intercept given equations in the form y = mx + b.

When writing your song – consider the following vocabulary and phrases.

Linear

Slope-Intercept Form – $y = mx + b$

Slope (m): (Rise over Run, Change in y over Change in x, $\frac{\Delta y}{\Delta x}$, rate of change, $\frac{y_2 - y_1}{x_2 - x_1}$)

Y-Intercept (b)

Constant Rate of Change

Point Slope Form: $y - y_1 = m(x - x_1)$

Solving for y = mx + b form

Standard Form: $Ax + By = C$

Parallel Lines/Perpendicular Lines

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Changes in Slope & Y-Intercept

Every function begins with a parent function. All other equations are derived as alterations to the parent function. We have studied the parent function for linear equations and looked at what can happen as a result of changing the slope or the y-intercept.

When writing your song – consider the following vocabulary and phrases.

Parent Function for Linear Functions: $f(x) = x$

Slope-Intercept Form: $y = mx + b$

Transformations

Slope(m) changes the steepness of the line

Steeper/Less Steep

When the slope is negative the line is reflected

Reflection across the x-axis

Y-Intercept (b) changes the starting point of the line

Shift Up/Shift Down

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Inequalities

Unlike linear equations, an inequality can have a multitude of answers. When studying inequalities this year we looked at how to create a graph that accurately represents all the possible solutions.

When writing your song – consider the following vocabulary and phrases.

Greater Than/Less Than

Greater Than or Equal To/Less Than or Equal To

Shading – Above the Line/Below the Line

Solid Line/Dotted Line

Solving Linear Inequalities (When dividing by a negative the inequality sign flips)

How to identify Solutions to Inequalities

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Systems of Equations

A system of equations is two linear equations graphed on the same coordinate plane. The point of intersection is the solution to the system. When learning to set up and solve systems of equations, we studied various methods to solve.

When writing your song – consider the following vocabulary and phrases.

Identifying Variables in a System

Setting Up Systems Equations (Money vs. Amount Problems, Coin Problems, Sum or Difference Problems, Perimeter Problems)

Solving Systems by Graphing

Solving Systems by Substitution

Solving Systems by Elimination

Identifying the Solution to a System

No Solution (Parallel Lines)

All Real Numbers (Same Line)

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Polynomials & Exponential Rules

Polynomials are expressions that contain multiple variables and exponents. During our unit on polynomials, we studied the many laws of exponents and ways to simplify polynomial expressions.

When writing your song – consider the following vocabulary and phrases.

Monomial

Binomial

Trinomial

Adding/Subtracting Polynomial Expressions (Ex: $2xy^3 + 6xy^3$)

Product of Powers (Ex: $x^2 \cdot x^3$)

Quotient of Powers (Ex: $\frac{x^6}{x^4}$)

Power of a Power (Ex: $(x^2)^3$)

Negative Powers (Ex: $\frac{x^3}{x^{-2}}$)

The Zero Power (Ex: x^0)

Distribution of Powers (Ex: $(x^4y^3)^2$)

Setting up and Solving Polynomials in Perimeter and Area Problems

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FOIL/Factoring

During our unit on polynomials we learned the ways to multiply out binomials using either the FOIL or box method. We also learned how to work backwards to factor, or divide out, trinomial expressions back into two binomials.

When writing your song – consider the following vocabulary and phrases.

Multiplying Monomial by a Binomial {Ex: $2x(x^2 + 5)$}

Multiplying a Binomial by a Binomial {Ex: $(x + 3)(4x - 5)$}

FOIL (First – Outer – Inner – Last)

Distribution Property

Multiplying Exponents Rule

Greatest Common Factor (GCF)

Factoring Trinomials

Solving for x (Remember there should be two answers)

Difference of Squares

Leading Coefficient Rules (divide by the leading coefficient, reduce, and move to the front)

Area Word Problems

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Quadratics

Quadratic equations are parabola or "u" shaped functions. During our unit on quadratics we analyzed how to identify parts of the quadratic graph and find the solutions to a quadratic equation by factoring.

When writing your song – consider the following vocabulary and phrases.

Quadratic Parent Function: $F(x) = x^2$

Standard Form: $Ax^2 + Bx + C = 0$

Vertex Point

Line of Symmetry

Maximum/Minimum Point

Solutions/Roots/X-Intercepts/Zeros

Domain/Range of Quadratics

Transformations on the Graph

Changes in A (makes the graph wider or narrower, when A is negative the graph opens downward)

Changes in C (shifts the graph up or down)

Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$