

PROGRAM OVERVIEW

Table of Contents for Instructional Units

Unit 1: Relationships Between Quantities

Topic A: Interpreting Structure in Expressions

Identifying Terms, Factors, and Coefficients

Interpreting Linear and Exponential Expressions

Topic B: Creating Equations and Inequalities in One Variable

Creating Linear Equations in One Variable

Creating Linear Inequalities in One Variable

Creating Exponential Equations

Conceptual Activities

Desmos. “Polygraph: Linear Inequalities.”

GeoGebra. “Simple Logic?”

GeoGebra. “Verbal to Algebraic!”

GeoGebra. “Linear Inequality Generator (1A).”

Conceptual Task

A Wing of a Deal, Parts 1 and 2

Topic C: Creating and Graphing Equations in Two Variables

Creating and Graphing Linear Equations in Two Variables

Creating and Graphing Exponential Equations

Conceptual Activities

Desmos. “Function Carnival, Part 2.”

Desmos. “Put the Point on the Line.”

GeoGebra. “Rise & Run (Revamped).”

GeoGebra. “Equation of a Line: Dynamic Illustrator.”

Conceptual Task

Weighing Job Offers, Parts 1 and 2

Topic D: Rearranging Formulas

Rearranging Formulas

Topic E: Solving Equations and Inequalities

Properties of Equality

Solving Linear Equations

Solving Linear Inequalities

Solving Exponential Equations

Conceptual Activities

Desmos. “Solutions to Systems of Linear Equations.”

Desmos. “Systems of Two Linear Equations.”

Conceptual Task

Inventory Indecision, Parts 1 and 2

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Topic F: Representing Constraints

Representing Constraints

Unit 1 Assessment

Station Activities

Set 1: Ratios and Proportions

Set 2: Solving Inequalities

Set 3: Solving Equations

Unit 2: Linear and Exponential Relationships

Topic A: Working with Rational Exponents

Working With Rational Exponents

Conceptual Activities

GeoGebra. “Classifying Rational Numbers.”

GeoGebra. “Rational Exponents.”

Conceptual Tasks

Illustrative Mathematics. “Computations with Complex Numbers,”
worksheets and teacher guide

Rational Decisions, Parts 1 and 2

Topic B: Graphs As Solution Sets and Function Notation

Graphing the Set of All Solutions

Intersecting Graphs

Domain and Range

Function Notation and Evaluating Functions

Conceptual Activities

Desmos. “Card Sort: Functions.”

Desmos. “Function Carnival, Part 2.”

GeoGebra. “Systems of Equations on a Graph.”

GeoGebra. “Domain and Range.”

Topic C: Solving Systems of Linear Equations

Solving Systems of Linear Equations by Substitution and Elimination

Solving Systems of Linear Equations by Graphing

Conceptual Activities

Desmos. “The Intersection.”

GeoGebra. “Solving a System of Equations by Elimination.”

GeoGebra. “Solving Systems Using Substitution.”

GeoGebra. “Solving Linear Systems Graphically.”

Conceptual Task

Boxing Match, Parts 1 and 2

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Topic D: Solving Linear Inequalities in Two Variables and Systems of Inequalities

Solving Linear Inequalities in Two Variables

Solving Systems of Linear Inequalities

Conceptual Activity

GeoGebra. “System of Inequalities.”

Conceptual Task

Book Cover Hustle, Parts 1 and 2

Topic E: Sequences As Functions

Sequences As Functions

Conceptual Activities

GeoGebra. “Sequences (Dynamic Illustrator).”

GeoGebra. “Graphs of arithmetic sequences on a coordinate plane.”

Topic F: Interpreting Graphs of Functions

Identifying Key Features of Linear and Exponential Graphs

Average Rate of Change

Recognizing Average Rate of Change

Conceptual Activities

Desmos. “Polygraph: Exponentials.”

GeoGebra. “Average Rate of Change.”

Conceptual Task

Infectious Dilemma, Parts 1 and 2

Topic G: Analyzing Linear and Exponential Functions

Graphing Linear Functions

Graphing Exponential Functions

Conceptual Activities

Desmos. “Card Sort: Linear Functions.”

Desmos. “Match My Line.”

Desmos. “What Comes Next?”

GeoGebra. “Explore exponential vs. linear functions.”

Topic H: Comparing Functions

Comparing Linear Functions

Comparing Exponential Functions

Comparing Linear to Exponential Functions

Conceptual Activities

Desmos. “Avi and Benita’s Repair Shop.”

Desmos. “Game, Set, Flat.”

Conceptual Task

Saving for a Boat, Parts 1 and 2

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Topic I: Building Functions

Building Functions from Context

Constructing Functions from Graphs and Tables

Conceptual Task

Jumping Jamal, Parts 1 and 2

Topic J: Operating on Functions and Transformations

Operating on Functions

Transformations of Linear and Exponential Functions

Conceptual Activities

Desmos. “Marbleslides: Exponentials.”

GeoGebra. “Function Transformations.”

GeoGebra. “All operations on functions.”

Topic K: Arithmetic and Geometric Sequences

Arithmetic Sequences

Geometric Sequences

Topic L: Interpreting Parameters

Interpreting Parameters

Conceptual Activity

GeoGebra. “Parameters of a Linear Equation.”

Unit 2 Assessment

Station Activities

Comparing Linear Models

Relations Versus Functions/Domain and Range

Comparing Exponential Models

Interpreting Exponential Functions

Sequences

Solving Systems by Substitution and Elimination

Solving Systems by Graphing

Using Systems in Applications

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Unit 3: Descriptive Statistics

Topic A: Working with a Single Measurement Variable

Representing Data Sets

Comparing Data Sets

Interpreting Data Sets

Conceptual Activities

Desmos. “LEGO Prices.”

Desmos. “Polygraph: Histograms.”

GeoGebra. “Lotto Tickets Simulation.”

GeoGebra. “Dot Plot Maker.”

GeoGebra. “Measures of Center.”

GeoGebra. “Visualize Measures of Center and Spread.”

GeoGebra. “Outlier Influence.”

Topic B: Working with Two Categorical and Quantitative Variables

Summarizing Data Using Two-Way Frequency Tables

Solving Problems Given Functions Fitted to Data

Analyzing Residuals

Fitting Linear Functions to Data

Conceptual Activity

Desmos. “Predicting Movie Ticket Prices.”

Conceptual Task

Time to Print in 3D, Parts 1 and 2

Topic C: Interpreting Linear Models

Interpreting Slope and y -intercept

Calculating and Interpreting the Correlation Coefficient

Distinguishing Between Correlation and Causation

Conceptual Activities

GeoGebra. “Correlation Experimentation.”

GeoGebra. “Correlation Sliders.”

Conceptual Task

Smartphone Surge, Parts 1 and 2

Unit 3 Assessment

Station Activities

Displaying and Interpreting Data

Line of Best Fit

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Unit 4: Expressions and Equations

Topic A: Interpreting Structure in Expressions

Interpreting Parts of an Expression

Interpreting Quadratic and Exponential Expressions

Conceptual Activity

GeoGebra. “Algebraic Expressions.”

Topic B: Operating with Polynomials

Adding and Subtracting Polynomials

Multiplying Polynomials

Conceptual Activity

GeoGebra. “Operations on Polynomials.”

Topic C: Writing Exponential Expressions in Equivalent Forms

Writing Exponential Expressions in Equivalent Forms

Conceptual Activity

GeoGebra. “Exponential Growth & Decay (Illustrated Meaning).”

Topic D: Creating and Solving Quadratic Equations in One Variable

Taking the Square Root of Both Sides

Factoring Expressions by the Greatest Common Factor

Factoring Expressions with $a = 1$

Factoring Expressions with $a > 1$

Solving Quadratic Equations by Factoring

Completing the Square

Applying the Quadratic Formula

Solving Quadratic Inequalities

Conceptual Activities

Desmos. “Build a Bigger Field.”

GeoGebra. “Factoring Expressions Using Algebra Tiles (1).”

Conceptual Task

Solution Squabble, Parts 1 and 2

Topic E: Creating Quadratic Equations in Two or More Variables

Creating and Graphing Equations Using Standard Form

Creating and Graphing Equations Using the x -intercepts

Creating and Graphing Equations Using Vertex Form

Rearranging Formulas Involving Quadratics

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Conceptual Activities

Desmos. “Match My Parabola.”

Desmos. “Penny Circle.”

GeoGebra. “The 3 forms of Quadratic functions.”

Conceptual Task

Toss Up, Parts 1 and 2

Topic F: Solving Systems of Linear and Quadratic Equations

Solving Systems Graphically

Solving Systems Algebraically

Conceptual Activity

GeoGebra. “The Evil Stepbrother.”

Unit 4 Assessment

Station Activities

Factoring

Solving Quadratics

Operations with Polynomials

Unit 5: Quadratic Functions and Modeling

Topic A: Working with the Number System

Rational and Irrational Numbers and Their Properties

Topic B: Interpreting Quadratic Functions

Interpreting Key Features of Quadratic Functions

Identifying the Domain of a Quadratic Function

Identifying the Average Rate of Change

Conceptual Activities

Desmos. “Domain and Range Introduction.”

Desmos. “Free-Range Functions.”

GeoGebra. “Average Rate of Change.”

GeoGebra. “Average Rate of Change Intervals.”

GeoGebra. “Quadratic in Vertex form with Key Features.”

Conceptual Task

Firework Celebration, Parts 1 and 2

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Topic A: Analyzing Quadratic Functions

Graphing Quadratic Functions

Interpreting Various Forms of Quadratic Functions

Conceptual Activities

Desmos. “Card Sort: Parabolas.”

GeoGebra. “The 3 forms of Quadratic functions.”

GeoGebra. “Graphing Quadratic Equations.”

Conceptual Task

Production Profit, Parts 1 and 2

Topic D: Building Functions

Building Functions from Context

Function Operations

Conceptual Activity

GeoGebra. “Building Functions Graphically.”

Conceptual Task

Coffee Compensation, Parts 1 and 2

Topic E: Transforming Functions

Replacing $f(x)$ with $f(x) + k$ and $f(x + k)$

Replacing $f(x)$ with $k \cdot f(x)$ and $f(k \cdot x)$

Conceptual Activities

Desmos. “Polygraph: Absolute Value.”

GeoGebra. “Function Transformations.”

Conceptual Task

This Curve You Can Change, Parts 1 and 2

Topic F: Graphing Other Functions

Square Root and Cube Root Functions

Absolute Value and Step Functions

Piecewise Functions

Conceptual Activities

Desmos. “Polygraph: Piecewise Functions.”

GeoGebra. “IRS Tax Function (2016) for Tax Payers Filing Single.”

GeoGebra. “Square Root Function.”

GeoGebra. “Step function explorer all parameters.”

Conceptual Task

Desmos. “Polygraph: Square Root Functions.”

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Topic E: Analyzing Functions

Analyzing Exponential Functions

Comparing Properties of Functions Given in Different Forms

Conceptual Activities

GeoGebra. “Exponential Functions: Graphs.”

GeoGebra. “Fastest Growing Function?”

Topic G: Finding Inverse Functions

Finding Inverse Functions

Conceptual Activity

GeoGebra. “Inverse functions.”

Unit 5 Assessment

Station Activities

Graphing Quadratic Equations

Quadratic Transformations in Vertex Form