Math 8-2 and Math 8-3 Curriculum Guide

This course utilizes Pearson Algebra 1

Unit 1: Elements of Algebra

- Review use of variables, evaluating & simplifying expressions
- Properties (associative, commutative, identity, inverse, distributive, equality)
- Solving linear equations
- Literal equations/Rewriting formulas
- Solving and graphing inequalities

Unit 2: Introduce Functions

- Domain and range
- Intervals of increase and decrease
- Define and evaluate functions
- Function notation
- Sketch/story of a function

Unit 3: Graphing & Writing Linear Equations & Inequalities

- Slope
- Graphing using slope-intercept
- Solving linear inequalities by graphing
- Writing equations in standard form, slope-intercept form & point-slope form
- Writing the equation of a line given certain information (2 points, // lines, lines, horizontal, vertical)
- Scatterplot as it relates to linear functions
- Arithmetic sequences (explicit only)

Unit 4: Linear Systems

- Solving by graphing
- Solving by substitution
- Solving by elimination
- Systems of linear inequalities
- Word problems to represent linear equations and inequalities with two variables in a real world context

Unit 5: Exponents

- Laws of exponents
- Use the properties of exponents to rewrite exponential expressions.
- Graphing exponential functions
- Exponential growth/decay
- Scientific notation
- Geometric sequences (explicit only)

Unit 6: Polynomials & Factoring

- Polynomials – identify the terms, coefficient, degree, leading coefficient, and constant term
- Adding & subtracting polynomials
- Multiplying polynomials
- Factoring polynomials (4 terms for 8-3 only)

Unit 7: Solving Quadratics

- Solving by factoring
- Solving using square roots
- Solving by completing the square (a = 1, b is even for 8-2)
- Solving by the quadratic formula including analyzing the discriminant
- Solving by graphing
- Solving linear/quadratic systems graphically and algebraically

Unit 8: Rational Algebraic Expressions & Equations

- Simplifying rational expressions
- Multiplying & dividing rational expressions
- Adding & subtracting rational expressions (uncommon denominators with 8-3 only)
- Solving rational equations

Unit 9: Radicals

- Square roots & cube roots
- Simplifying radical expressions
- Operations with radicals including variables
- Application - Pythagorean Theorem, Quadratic Formula

Unit 10: Additional Functions

- Step and piece-wise functions
- Key features of the graphs of various functions: domain/range, intercepts, zeros, increasing/decreasing intervals, positive/negative, maxima/minima and symmetries
- Calculate and interpret the average rate of change of a function over a specified interval
- Compare and distinguish between linear, quadratic and exponential functions
- Graphing functions - linear, quadratic, square root, absolute value and exponential
- Transformations (vertical shifts, horizontal shifts, reflect in the x-axis, vertical compress/stretch)
- Functions – context and application

Unit 11: Statistics

- Samples & populations
- Measures of central tendency
- Single variable statistics (dot plots, histograms, and box-and-whisker plot with outliers)

- Single variable statistics that compare shape, center (median, mean) and spread/dispersion (interquartile range and sample standard deviation)
- 2-variable statistics (scatter plot, linear regression and correlation coefficient using the graphing calculator)
- Distinguish between correlation and causation
- Two-way tables