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