

Syllabus – Algebra II Credit (120 hours)

Peddie Summer School

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Topics covered include but are not limited to the following:

Simplifying Expressions

Using the Properties of Exponents, Adding and Subtracting Polynomials, Multiplying Polynomials, Multiplying Rational Expressions, Adding and Subtracting Rational Expressions, Simplifying Complex Rational Expressions, Dividing Polynomials using long division or synthetic division, Simplify radical expressions, Simplify expressions with rational exponents, Simplify expressions containing imaginary and complex numbers, Using the properties of Logarithmic Expressions including expanding and condensing

Solving Various Types of Equations and Inequalities

Solving Linear Equation, Simple and Compound Inequalities, Absolute Value Equations and Inequalities, A System of Equations in Two or Three Variables, By Factoring, Rational Equations, Using Rational Roots Theorem, Radical Equations, Equations with complex number solutions, Quadratic Equations by factoring, completing the square, quadratic formula or square root property, Quadratic Equations reducible to quadratic form, Nonlinear Inequalities and systems of nonlinear inequalities, Exponential and logarithmic equations

Factoring Various Polynomials

Factoring Trinomial Squares, Difference of Squares, Grouping, Sum/Difference of Cubes , Various Trinomials

Applications

Solving Percent Change, Mixture, Investment, Distance, and Geometry Problems, Apply quadratic equations to word problems, Exponential Growth and Decay problems, Compound Interest problems

Graphing

Graphs of Vertical and Horizontal Lines, Linear Equations using Intercepts or Slope-Intercept Form of a Line, Linear Inequalities and Systems of Linear Inequalities, Transformation of graphs, Quadratic equation (parabola) using vertex, x- and y- intercepts and axis of symmetry, Graphing circles, ellipses, parabolas and hyperbolas, Exponential function and logarithmic function including $y = e^x$ and $y = \ln x$

Matrices

Add/subtract/multiply matrices, Multiply a matrix by a scalar, Find the determinant of a 2X2 and 3X3 matrix, Find the additive and multiplicative inverse of a matrix, Solving a system of equations through row operations as well as inverse matrices

Writing Equations

Writing the Equation of a Line, Equations of Parallel and Perpendicular Lines, Equations of polynomials with given solutions (real, irrational or imaginary), Equations of Conic Sections given characteristics, Equations of Conic Sections in Standard form when given General Form

Functions and Relations

Find the Domain and Range of a function, Determine whether a relation is a function, Test for symmetry with respect to the axes, origin and the line $y = x$, Find the inverse of a relation or function, Determine whether a function is invertible, Evaluate a function, Find the composition of two or more functions

Probability

Basic probability, Differentiate between mutually exclusive, independent and overlapping events, Permutations and Combinations, Calculate the probability of the union of two events including overlapping events, Calculate the probability that an event does not occur, Use binomial distribution to find the probability that an event will occur.

Sequences and Series

Find specific terms and general terms of a sequence, Find partial sums for a sequence, Geometric Sequences, Arithmetic Sequences

The course is taught with the use of the TI – 83/84 + Graphing calculator.