**Overview for PFA Advanced Math**

**Semester 2**

In the second semester of Saxon Advanced Mathematics at Pioneer Family Academy, we complete in order lessons 70 through 125 along with the respective tests for those lessons. The book is written in a spiral review method. Covered in this semester are the following topics by lesson titles:

**Algebra, Math Analysis and Number Theory**

Percentiles and z Scores, The Ellipse, Cramer’s Rule, Combinations and Permutations, Functions of (-x), Binomial Expansion using Pascal’s Triangle, The Hyperbola, DeMoivre’s Theorem applied to expressions in rCiSΘ form, Roots of Complex Numbers, Logarithms and Exponential Equations, Probability, Factorable Expressions, Clock Problems, Arithmetic Progressions and Arithmetic Means, Exponential Growth and Decay Functions, Geometric Progressions and Geometric Means, Notations for Permutations and Combinations, Advanced Complex Roots, Change of Base Property of Logarithm, Solve Logarithmic equations. Sigma notation for sequences, Zero Determinants, 3x3 Determinants, Independent Equations. Binomial Theorem of expansion, Application of Logarithms with H+ and pH measures of the strength of acid, Arithmetic and Geometric Series, Cofactors and Expansion by Cofactors, Translated Conic Sections and Standard forms of Ellipses and Hyperbolas, Convergent Geometric Series, Matrix Additions and Multiplications, Rational Numbers, Logarithmic Inequalities, Synthetic Division, Zeros and Roots, Graphs of Factored Polynomial Functions, Remainder Theorem, The Fundamental Theorem of Algebra, The Region of Interest, Rational Roots Theorem, Descarte’s Rule of Signs, Upper and Lower Bound Theorem, Irrational Roots, Matrix Algebra and Inverse Matrices, Piecewise Functions, Greatest Integer Function, Graphs of Rational Functions, Graphs that Contain Holes, The General Conic Equation, Point of Division Formulas, Using Graphing Calculator to Graph and Solve Systems of Equations and Roots

**Geometry, Logic and Trigonometry**

Regular Polygons, Triangle Area Formula, Similar Polygons, Trigonometric Identities, Law of Sines, Law of Cosines, Sketching a Sinusoid, Trigonometric Equations, Sum and Difference Identities, Tangent Identities, Double Angle Identities, Half Angle Identities, The Ambiguous Case, Graphing Tangent, Cotangent, Secant and Cosecant, Proving the Law of Sines, Product Identities, Graphing ArcSine and ArcCosine