|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Solving Equations | Linear: 2 step, fractional coefficients, distributive property  Solving proportion equations  Linear inequalities | Linear: multi variable, variables on both sides,  fractional coefficients  Absolute Value—Basic  Rational equations  Working with formulas/rearranging formulas (isolate the variable)  Solving linear inequalities | Review: Solving linear equations  Absolute Value – Expand  Rational equations  Exponentials with graphing/reasoning  Working with formulas | Quadratic: Solving by factoring, quadratic formula, completing the square, taking square roots, using a calculator to find zeros  Rational equations Domain issues  Radical Equations | Higher Order: Rational roots, remainder theorem, long division, synthetic division, fundamental theorem of algebra, Descartes’ Rule of Signs, Numerical Methods: calculator approximation, Newton’s Method  Factoring (by grouping/other methods)  Radical Equations  Exponential/Logarithmic  Solving inequalities with higher order |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Simplifying and Working with Numerical Expressions | Review fractions (add, subtract, multiply, divide)  Review signed numbers  Order of operations  Evaluating complex rationals  Exponents (numerical values) | Include fractions in context  Number systems (real, rational, irrational)  Properties of exponents (numerical) (make them write it out) | Include fractions in context  Properties of exponents (numerical) | Evaluating complex rationals  Unit circle  Complex numbers (basic operations), Complex plane  Number systems: review real, rational, irrational, complex  Review properties of exponents (numerical)  Properties of rational exponents (numerical) | Trig identities  Evaluating logarithms (basic properties) |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Simplifying and Working with Algebraic Expressions | Touch on combining like terms  Factoring by “un-distributing” | Combining like terms (linear, constants)  Properties of Exponents (algebraic)  Multiplying a monomial with a binomial  Factor out a GCF | Combining like terms (linear, constants)  Properties of exponents (algebraic)  Factoring  Multiplying two binomials with | Combining like terms (radical, polynomial, rational)  Review properties of exponents  Properties of rational exponents (algebraic)  Rational exponents (switching forms)  Factoring polynomials (extend time spent), sum or difference of squares, quadratic like, factoring by grouping | Combining like terms (rational, logarithmic)  Factoring higher order expressions (tie to zeros) |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Solving Systems of Equations |  | Solving linear systems  by graphing (table mostly, slope-intercept), substitution no context Ex: ,  Solving systems of linear inequalities (compound inequalities, AND/OR, conjunctions) Ex: | Writing equations from context.  Solving linear systems of equations (by graphing, elimination, substitution Ex: )  Solving systems with one exponential and one linear equation by graphing.  Solving systems of inequalities (2 variables, more complex compound inequalities: variables on both sides, distribute negatives)  HONORS  Matrices (add, subtract, multiply) from a situation | Review elimination method with 2 equations, 2 unknowns.  Solving systems by graphing and substitution (linear and quadratic, linear and circles)  Solve systems with 3 equations, 3 unknowns.  Solving systems of inequalities by graphing (quadratic and quadratic, linear and quadratic) | Solving systems with matrices (notation, building matrices to model, RREF, inverse, determinant) |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Conics |  |  |  | Parabolas  Focus, directrix, axis of symmetry  If given a directrix and focus, write the equation  Circles  Standard form  Given the equation, find the center, radius, and graph.  Given center and radius, write the equation | Ellipses  Hyperbolas |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Functions |  | Function notation  Domain and Range (interval notation optional)  Modeling functions with equations – linear  Inverse operations (when solving equations) produce the identity | Function notation  Domain and Range (exponential functions)  Seeing patterns (sequences: arithmetic, geometric)  Arithmetic of Functions (connect to solving)  Simple compositions Ex:  Modeling functions with equations – linear, exponential  Inverses (symmetry, reflection across y=x) | Domain and Range (interval notation)  Modeling with equations – radicals (square roots)  Periodic Trig Functions (unit circle, graphing sine/cosine)  Inverse Functions: linear, quadraic  Inverse notation  Composition  With linear/quadratic (connect to solving by substitution) | Sequences and Series (arithmetic, geometric, finite, infinite)  Modeling functions with equations –exponential, polynomial with order higher than 2, radicals (higher order), logarithmic  Inverse  Composition of functions (all notations) |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Functions (continued)  “Good Graphing”  Label axes  Scale (in context)  Appropriate arrows  x-int(s), y-int  discrete/continuous  linear (use a ruler)  accurate/precise |  | Graphing linear functions – tables mostly, slope intercept form  Transformations  Vertical | Graphing absolute values functions  Graphing exponential functions  Graphing piecewise functions (absolute value)  Translations are vertical transformations (connect vertical shift of a graph of a function to a translation of a polygon) | Graphing quadratic functions  Graphing square roots  Graphing piecewise (linear, quadratic) | Graphing polynomial functions  Graphing logarithmic functions  Graphing rational functions  Graphing radicals (cube roots)  Graphing greatest integer function  Graphing 3 variables |
| Topic | Intermediate 1 | Intermediate 2 | Secondary 1 | Secondary 2 | Secondary 3 |
| Geometry | Area (circle, square, rectangle, triangle)  Perimeter  Volume  Surface area  Angles  -vertical angles  -adjacent  -supplementary  -complementary  -linear pairs  -  Know correct notations  Name an angle in 4 ways  Use a protractor to measure an angle  Solving proportions | Points, lines, planes, rays, segments (correct notation, naming)  Review using a protractor  Parallel lines with transversal: angle relationships like alternate interior/exterior, corresponding, consecutive (same side) interior/exterior  Use theorems  Distance Formula  Congruence Statements  Classify triangles according to their sides and angles  Use and apply properties of isosceles and equilateral triangles.  Inequalities to determine sides and angles (largest angles across from longest sides, etc.)  Recognize triangles and their corresponding parts  Similarity  Pythagorean Thm  Find surface area and volume of a prism, cylinder, pyramid, cone, and sphere.  Compare and find the areas and volumes of similar solids. | Constructions (compass/straightedge)  -angle bisector  -segment bisector  -perpend. bisector  -copy a segment  -copy an angle  -inscribed hexagon  -equilateral triangle  -square  -parallel lines  -perpendicular to point on a line  -perpendicular to point off a line  Justify why these constructions work with a proof (two-column, paragraph, flow chart proofs)  Congruence (SAS, SAS, ASA, AAS, HL)  Sum of measures of interior angles  Sum of measures of exterior angles  Classify as equilateral, equiangular, regular, or none  Classify and know properties of quadrilaterals  Properties of diagonals  Classify polygons in the coordinate plane  Perimeter, area of parallelograms, trapezoids, rhombus, kites | Midpoint Formula  Centers of a triangle (orthocenter, incenter, circumcenter, centroid)  Parallelograms  -rhombus, rectangle, square  -characteristics  Similarity  -write ratios  -solve proportions  -determine similarity  -find scale factor  -find measurement  -geometric mean  -find perimeters and areas of similar figures  Dilations  -scale factor  -reduction/enlargement  Tangents/Secants  30-60-90  45-45-90  Use the Pythagorean Theorem and it’s converse  Prove:  Isosceles Base Angle theorem and corollary  Midsegments of triangles  Right Triangle Trig  Find missing side lengths and angles  Find the measure of a central angle and an arc  Find the circumference and arc length of a circle  Find the area of a sector of a circle  Identify and use the properties of a tangent to a circle. |  |