Algebra I

Students will be able to:

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A. Do computations with integers
1. Adding Integers
2. Subtracting Integers
3. Multiplying Integers
4. Dividing Integers
5. Use the above operations to solve application problems

Common Core: Middle School Standards

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B. Simplify and evaluate expressions
1. Simplify expressions using the order of operations
2. Use the distributive property to simplify expressions
3. Simplify expressions by combining like terms
4. Evaluate expressions by substitution
5. Simplify and evaluate expressions using a combination of the above skills (*A-APR-1*)
6. Identify and define parts of an expression (term, coefficient, factors, variable) *(A-SSE-1a)*

Common Core: A-SSE-1, A-APR-1

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C. Solve a variety of equations and inequalities
1. Solve a one step linear equation
2. Solve a two step linear equation
3. Solve linear equations using the distributive property
4. Solve linear equations that require combining like terms

5. Solve linear equations with the variable on both sides of the equation
6. Solve multi-step linear equations using a combination of the above skills (A-REI-1, A-REI-3)
7. Solve literal equations (A-CED-4)
8. Identify and solve linear equations in application problems (A-CED-1)
9. Solve multi-step linear inequalities (A-REI-1, A-REI-3)
10. Solve linear inequalities where the coefficient of the variable is negative   (A-REI-1, A-REI-3)
11. Solve absolute value equations
12. Solve simple quadratic equations (A-REI-4B)

Common Core: A-REI-1, A-REI-3, A-REI-4b, A-CED-1, A-CED-4

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D. Graph linear equations, inequalities and absolute value equations
1. Plot points on the coordinate plane
2. Find the slope of the line passing through two points on a graph (F-IF-6)
3. Find the slope of the line passing through two points using the slope formula (F-IF-6)
4. Identify lines as parallel or not parallel based on their slopes
5. Describe graphs using slope and y-intercept (F-IF-4, F-IF-6)
6. Graph equations given in slope-intercept form (F-BF-2, F-IF-7A, A-REI-10)

7. Graph equations given in point-slope form (F-BF-2, F-IF-7A, A-REI-10)
8. Graph equations given in standard form (F-BF-2, F-IF-7A, A-REI-10)
9. Graph vertical and horizontal lines given the equation (F-IF-7A, A-REI-10)
10. Write equations in slope-intercept form given the graph of a line (F-BF-2)
11. Write equations in point-slope form given the graph of a line (F-BF-2)
12. Write equations for vertical and horizontal lines (F-BF-2)
13. Graph one variable inequalities on a number line (A-CED-1, A-REI-3)
14. Graph two variable inequalities on the coordinate plane (A-REI-12)
15. Graph absolute value equations
16. Use a combination of the skills above to solve application problems

Common Core: A-REI-3, A-REI-10, A-REI-12, F-IF-4, F-IF-6, F-IF-7a, F-BF-1A, F-BF-2, A-CED-1

E. Solve systems of linear equations
1. Solve systems of linear equations by graphing (A-REI-6, A-REI-11)
2. Solve systems of linear equations by substitution (A-REI-6)
3. Solve systems of linear equations by elimination(A-REI-5)
4. Solve application problems using systems

Common Core: A-REI-5, A-REI-6, A-REI-11

F. Rules of exponents
1. Simplify expressions using Product Rule
2. Simplify expressions using Quotient Rule
3. Simplify expressions using Power Rule
4. Simplify expressions using negative exponents
5. Simplify expressions using zero exponents
6. Use a combination of the above skills to simplify expressions

Common Core: N-RN-1, N-RN-2

G. Identify functions and use function notation
1. Differentiate between relations and functions (*F-IF-1, F-IF-3)*
2. Determine if a relation is a function using the vertical line test (*F-IF-1, F-IF-3)*
3. Evaluate functions using function notation (*F-IF-2)*
4. Identify the domain and range of a function (*F-IF-1)*

Common Core: F-IF-1, F-IF-2, F-IF-3

H. Data Analysis
1. Find the mean of a data set (S-ID-2)
2. Find the median of a data set (S-ID-2)
3. Find the mode of a data set (S-ID-2)
4. Find the range of a data set (S-ID-2)
5. Find the five-number summary (S-ID-2)
6. Find the IQR (S-ID-2)
7. Identify the outliers (S-ID-3)
8. Create a box-and-whisker (S-ID-1)
9. Create a histogram (S-ID-1)
10. Create a scatterplot (S-ID-6A)
11. Find the equation of the best fit line

(S-ID-6C, S-ID-7)

Common Core: S-ID-1, S-ID-2, S-ID-3, S-ID-6A, S-ID-6C, S-ID-7

I. Use a graphing calculator

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   1. Enter data into lists (F-IF-7)
   2. Adjust the window (F-IF-7)
   3. Graph equations (F-IF-7)
   4. Find intersections (A-REI-11)
   5. Run a linear regression (S-ID-8)

Common Core: S-ID-8, F-IF-7, A-REI-11

Geometry
Students will be able to:

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A. Apply reasoning skills to make accurate conclusions
   1. Use inductive reasoning
   2. Use deductive reasoning
   3. Vertical angle conjecture
   4. Linear pair conjecture
   5. Parallel line conjectures
   6. Perpendicular line
   7. Supplementary/Complementary Angle
   8. Identify types of Angles (acute, right, obtuse)

Common Core: G-CO-1, G-CO-9, G-GPE-4, G-GPE-5,

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B. Measure and construct geometric figures using appropriate tools
   1. Measure and draw angles with protractors
   2. Measure and draw segments with rulers
   3. Construct congruent segments
   4. Construct perpendicular bisectors
   5. Construct congruent angles
   6. Construct perpendicular lines
   7. Construct parallel lines
   8. Construct angle bisectors
   9. Construct an equilateral triangle
   10. Construct a square
   11. Construct a regular hexagon
   12. Construct the incenter of a triangle
   13. Construct the circumcenter of a triangle

Common Core: G-C0-12, G-C0-13, G-C-3, G-GPE-6

C. Apply the properties of polygons and circles

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1. Know the definition of a polygon
2. Diagonal relationships
3. Sum of the interior angles
4. Sum of the exterior angles
5. Triangle mid-segment properties
6. Trapezoid mid-segment properties
7. Properties of special parallelograms
8. Special angles of circles (central, inscribed)
9. Chord properties
10. Tangent properties
11. Cyclic Quadrilateral

Common Core: G-CO-10, G-C0-11, G-C-1, G-C-2, G-C-3, G-GPE-4

D. Find the perimeter and area of polygons and circles

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1. Find perimeter of polygons
2. Find the circumference
3. Find the arc length
4. Find the area of polygons
5. Find the area of circles
6. Finding areas of sectors
7. Use the distance formula

Common Core: G-C-5, G-GPE-7

E. Find the volume and surface area of solids

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1. Find the volume of rectangular prisms

2. Find the volume of cylinders
3. Find the volume of spheres
4. Find the volume of square pyramids
5. Find the volume of cones
6. Find the surface area of rectangular prisms
7. Find the surface area of cylinders
8. Find the surface area of spheres
9. Find the surface area of square pyramids
10. Find the surface area of cones
11. Use volume and surface area formulas in an application

Common Core: G-GMD-3,

F. Apply the properties of congruency and similarity
1. Triangle congruency conjectures (ASA, AAS, SAS, SSS)
2. Triangle similarity conjectures (AA, SSS with same ratio, SAS with same ratio)
3. Transformations of polygons

Common Core: G-C0-2, G-C0-3, G-C0-4, G-CO-5, G-CO-6, G-CO-7, G-CO-8, G-SRT-1, G-SRT-2, G-SRT-3, G-SRT-4, G-SRT-5,

G. Apply the Pythagorean theorem and basic trigonometric functions

1. Apply the Pythagorean Theorem
2. Identify special right triangles (45-45-90 and 30-60-90)
3. Identify equation of a circle
4. Identify Sine ratio
5. Identify Cosine ratio
6. Identify Tangent ratio
7. Identify the Law of Sines ****
8. Identify the Law of Cosines****
9. Apply Trig ratios find missing value

Common Core: G-SRT-6, G-SRT-7, G-SRT-8, G-GPE-1,

<u>Algebra II</u>
Students will be able to:

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A. Apply the properties of linear functions (Unit 1)
1. Find the slope of the line passing through two points
2. Identify lines as parallel, perpendicular or oblique based on their slopes
3. Describe graphs using slope and y-intercept
4. Graph equations given in slope-intercept form
5. Graph equations given in point-slope form
6. Graph equations given in standard form
7. Graph vertical and horizontal lines given the equation
8. Write equations in slope-intercept form given the graph of a line
9. Write equations in point-slope form given the graph of a line
10. Write equations for vertical and horizontal lines (Unit 4, 6)
11. Use a combination of the skills above to solve application problems

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B. Recognize and transform parent functions
1. Identify linear functions (Unit 1)
2. Identify quadratic functions (Unit 3)
3. Identify absolute value functions (Unit 4)
4. Identify piece-wise functions (Unit 4)
5. Identify step-functions (Unit 4)
6. Identify square root functions (Unit 4)
7. Identify exponential functions (Unit 6)
8. Identify cubic functions (Unit 4)
9. Identify inverse power functions (Unit 4)
10. Apply translations on functions (Unit 3, 4)
11. Apply reflections on functions (Unit 3, 4)
12. Apply vertical stretches/shrinks on functions (Unit 3, 4)

Common Core: F-BF-3, F-IF-7A, F-IF-7B, F-IF-7C, F-IF-7E,

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    C. Find the domain and range of functions
1. Find the domain and range given a data set (Unit 3)
2. Find the domain and range of a parent function (Unit 3, 4, 6)
3. Find the domain and range of a transformed function (Unit 3, 4, 6)
4. Find the domain and range of inverse functions (Unit 5)

Common Core: F-IF-1, F-IF-2, F-IF-5

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    D. Find the zeros and asymptotes of functions
1. Find the zeros of a linear function algebraically (Unit 1)
2. Find the zeros of a quadratic function algebraically (Unit 3)
3. Find the zeros of an absolute value function algebraically (Unit 4)
4. Find the zeros of a square root function algebraically (Unit 4)
5. Find the zeros of an exponential function algebraically (Unit 6)
6. Find the zeros of any function graphically (Unit 3, 4, 6)
7. ==Find the asymptotes of a function algebraically (HONORS)== (Unit 4, 6)
8. ==Find the asymptotes of a function graphically (HONORS)== (Unit 4, 6)

Common Core: F-IF-7C, F-IF-8A, A-APR-3, A-SSE-3A

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    E. Find the inverses of functions (Unit 5)

1. Find the inverse of a function algebraically
2. Graph the inverse of a function

Common Core: F-BF-4A

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F. Apply the rules of logarithms and exponents
   1. Simplify expressions using Product Rule (Unit 6)
   2. Simplify expressions using Quotient (Unit 6)
   3. Simplify expressions using Power Rule (Unit 6)
   4. Simplify expressions using negative exponents (Unit 6)
   5. Simplify expressions using zero exponents(Unit 6)
   6. Simplify using rational exponents(Unit 6)
   7. Simplify logarithmic expressions using Quotient Property (Unit 7)
   8. Simplify logarithmic expressions using the Product Property (Unit 7)
   9. Simplify logarithmic expressions using the Power Property (Unit 7)
   10.   Use a combination of the above skills to simplify expressions (Unit 6, 7)
   11.   Apply the above skills to solve application problems (Unit 6, 7)

Common Core: N-RN-1, N-RN-2, A-SSE-3C, F-IF-8B, F-LE-1, F-LE-2, F-LE-3, F-LE-4, F-LE-5,

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G. Apply matrix operations (Unit 2)
   1. Add matrices
   2. Subtract matrices
   3. Multiply matrices (Honors by hand)
   4. Scalar multiplication
   5. Use matrices to solve systems

Common Core: N-VM-6, N-VM-7, N-VM-8, N-VM-9, A-REI-8, A-REI-9

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H. Complete operations with polynomials and complex numbers
1. Identify the degree of the polynomial (Unit 8)
2. Add and subtract polynomials (Unit 8)
3. Multiply polynomials (Unit 3, 8)
4. Divide polynomials (long division/synthetic) (Unit 8)
5. Factor polynomials (Unit 3, 8)
6. Using the quadratic formula (rational vs irrational) (Unit 3, 8)
7. Completing the square of quadratics (Unit 3)
8. Finding maximum and minimum of polynomials (Unit 3, 4)
9. Finding the real roots of polynomials (Unit 8)
10.   Finding the complex real roots of polynomial (Unit 8)
11.   Add and subtract complex numbers (Unit 8)
12.   Multiply complex numbers (Unit 8)

Common Core: N-CN-1, N-CN-2, N-CN-7, A-SSE-3B, A-APR-1, A-APR-3, A-APR-6, A-REI-2, A-REI-4A, A-REI-4B, F-IF-4

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I. Solve systems of equations and inequalities (Unit 2)
1. Solve systems of equations graphically
2. Solve systems of equations using substitution
3. Solve systems of equations using elimination
4. Solve systems of equations using matrices
5. Solve systems of inequalities graphically
6. Solve linear programming problems

Common Core: A-REI-5, A-REI-6, A-REI-7, A-REI-12, A-CED-3

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J. Probability (Unit 9)
   1. Definition of probability
   2. Probability of Independent Events
   3. Probability of Dependent Events
   4. Conditional probability

Common Core:

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K. Use a graphing calculator
   1. Enter data into lists (Unit 1)
   2. Adjust the window (Unit 1,2,3)
   3. Graph equations (Unit 1-6)
   4. Using tables (Unit 1-3)
   5. Find intersections (Unit 2,3)
   6. Run regressions (Unit 1)
   7. Find the correlation coefficient (Unit 1)
   8. Finding residuals (Unit 1)
   9. Find min and max points (Unit 3)
   10.   Use matrices (Unit 2)
   11.   Find zeroes (Unit 3-6)

Common Core: S-ID-8, F-IF-7, A-REI-11, S-ID-6B, F-IF-7A, F-IF-7B, F-IF-7C, F-IF-7E

Trigonometry
Students will be able to:
   A. Apply angle measure with trigonometric functions
      1. Understand radian measure
   B. Evaluate and graph trigonometric functions
   C. Derive trigonometric identities

D. Solve trigonometric equations
E. Apply trigonometric ratios and properties
F. Perform operations with complex numbers