ALGEBRA 1

GOALS: Students will develop skills and understanding in:

1. The basic language of algebraic expression
2. Solving of linear equations and inequalities
3. The basic language of graphing
4. The addition, subtraction, multiplication and division of polynomials
5. The several methods of factoring
6. Solving rational equations
7. Systems of equations
8. Radical expressions and equations
9. Solving quadratic equations

OBJECTIVES: Students will be able to:

Goal 1. The basic language of algebraic expressions

1.1 Translate data to algebraic expressions (1.1)
1.2 Translate date to equations (1.1)
1.3 Use commutative, associative and distributive laws to rewrite expressions (1.2)
1.4 Use the distributive law for factoring (1.2)
1.5 Determine the prime factorization of expressions (1.3)
1.6 Add, subtract, multiply and divide and simplify fractions (1.3)
1.7 Graph the sets of rational numbers – integers, whole , and natural (1.4)
1.8 Recognize and use absolute values (1.4)
1.9 Add, with and without the number line (1.5)
1.10 Solve word problems using positive and negative numbers (1.5)
1.11 Combine like terms (1.5)
1.12 Use the additive inverse in subtracting (1.6)
1.13 Solve word problems involving subtraction (1.6)
1.14 Multiply and divide real numbers (1.7)
1.15 Use exponential notation in writing expressions (1.8)
1.16 Evaluate expressions according to the order of operations (1.8)
1.17 Simplify expressions using the distributive law (1.8)

Goal 2. Solving linear equations and inequalities

2.1 Solve equations using the addition principle (2.1)
2.2 Solve equations using the multiplication principle (2.1)
2.3 Solve equations using both principles (2.2)
2.4 Combine like terms (2.2)
2.5 Clear equations of fractions and decimals before solving (2.2)
2.6 Evaluate formulas (2.3)

2.7 Solve a formula for a given letter (2.3)
2.8 Convert between percent and decimal notation (2.4)
2.9 Solve percent problems (2.4)
2.10 Use the five step method for solving word problems (2.5)
2.11 Sole inequalities using the addition and multiplication principles (2.6)
2.12 Graph inequalities (2.6)
2.13 Solve word problems using inequalities (2.7)

Goal 3. The basic language of graphing

3.1 Solve problems using pie, bar and line graphs (3.1)
3.2 Identify points and ordered pairs (3.1)
3.3 Estimate and predict solutions using graphs (3.1)
3.4 Graph linear equations (3.2)
3.5 Calculate intercepts (3.3)
3.6 Use intercepts to graph (3.3)
3.7 Graph horizontal and vertical lines (3.3)
3.8 Calculate rates of change (3.4)
3.9 Calculate the slope of a line (3.5)
3.10 Use the slope-intercept form of an equation to graph (3.6)
3.11 Write the point-slope form of an equation (3.7)
3.12 Graph an equation from the point-slope form (3.7)

Goal 4. The addition, subtraction, multiplication and division of polynomials

4.1 Multiply powers with like bases (4.1)
4.2 Divide powers with like bases (4.1)
4.3 Raise a power to a power (4.1)
4.4 Raise a product or a quotient to a power (4.1)
4.5 Identify the number and degree of terms in an expression (4.2)
4.6 Evaluate polynomials (4.2)
4.7 Add and subtract polynomials (4.3)
4.8 Multiply monomials (4.4)
4.9 Multiply a monomial and a polynomial (4.4)
4.10 Multiply any two polynomials (4.4)
4.11 Multiply two binomials using the FOIL method (4.5)
4.12 Multiply sums and differences of two terms (4.5)
4.13 Square binomials (4.5)
4.14 Add and subtract polynomials (4.6)
4.15 Divide by a monomial (4.7)
4.16 Divide by a binomial (4.7)
4.17 Convert between positive and negative exponents (4.8)
4.18 Convert between decimal and scientific notation (4.8)
4.19 Multiply and divide using scientific notation (4.8)

Goal 5. The several methods of factoring

5.1 Factor monomials (5.1)
5.2 Factor when terms have a common monomial factor (5.1)
5.3 Factor by grouping (5.1)
5.4 Factor trinomials (5.2, 5.3)
5.5 Recognize and factor perfect square trinomials (5.4)
5.6 Recognize and factor differences of squares (5.4)
5.7 Choose the correct method of factoring (5.5)
5.8 Use factoring to solve quadratic equations using the principle of zero products (5.7)
5.9 Use the Pythagorean Theorem to solve applications of quadratic equations (5.7)

Goal 6. Solving rational equations

6.1 Simplify rational expressions (6.1)
6.2 Multiply and Divide rational expressions (6.2)
6.3 Add and subtract rational expressions when the denominators are the same(6.3)
6.4 Calculate the least common multiple and least common denominator (6.3)
6.5 Add and subtract rational expression when the denominators are not the same (6.4)
6.6 Simplify complex rational expressions (6.5)
6.7 Solve rational equations (6.6)
6.8 Solve problems involving work (6.7)
6.9 Solve problems involving motion (6.7)
6.10 Solve problems involving proportions (6.7)

Goal 7. Systems of equations

7.1 Solve a system of linear equations by graphing (7.1)
7.2 Use substitution to solve a linear system (7.2)
7.3 Use the elimination method solve a linear system (7.3)
7.4 Use systems of equations to solve total value and mixture problems (7.4)
7.5 Graph linear inequalities (7.5)
7.6 Graph systems of inequalities (7.6)
7.7 Solve problems using direct and inverse variation (7.7)

Goal 8. Radical expressions and equations

8.1 Simplify radical expressions (8.1)
8.2 Multiply and simplify radical by factoring (8.2)
8.3 Divide radical expressions (8.3)
8.4 Rationalize denominators (8.3)
8.5 Add and subtract radical expressions (8.4)
8.6 Solve radical equations (8.5)
8.7 Solve word problems involving radicals (8.5)
8.8 Use the Pythagorean Theorem to solve right triangles (8.6)
8.9 Simplify higher roots (8.7)
8.10 Multiply and divide expressions containing higher roots (8.7)
8.11 Simplify rational exponents (8.7)

Goal 9. Solving quadratic equations

9.1 Solve quadratic equations of the type $(x + k)^2 = p$ (9.1)
9.2 Solve quadratic equations by completing the square (9.2)
9.3 Solve quadratic equations using the quadratic formula (9.3)
9.4 Solve formulas for a given variable (9.4)
9.5 Solve equations involving complex numbers (9.5)
9.6 Graph parabolas (9.6)
9.7 Identify functions (9.7)
9.8 Use functions notation (9.7)