Lesson 1.0

1. Define "set," "element," "finite set," and "infinite set," "empty set," and "null set" and give two examples of each term.

2. Define "subset," "universal set," and "disjoint set" and give two examples of each term.

3. Define the sets of numbers: naturals, wholes, integers, rationals, irrationals, and reals.

4. Explain the relationship between any two sets of numbers.

5. Draw a Venn diagram that graphically explains the relationship of the sets of numbers.

6. List every set to which any number belongs.

7. Determine if a set is finite or infinite or empty.

Lesson 1.1

1. Define "numeric expression" and give two examples of the term.

2. Explain the steps of the order of operations.

3. Explain different types of grouping symbols.

4. Simplify numeric expressions using the order of operations.

Lesson 1.2

1. Define "algebraic expression," "term," "variable," and "coefficient" and give two examples of each term.

2. Replace variables with numbers to obtain a numeric expression.

3. Evaluate algebraic expressions for given values of the variables.

Lesson 1.3

1. Explain the commutative property of addition and give two examples of it.

2. Explain the commutative property of multiplication and give two examples of it.

3. Explain the associative property of addition and give two examples of it.

4. Explain the associative property of multiplication and give two examples of it.

5. Simplify numeric expressions by using the commutative and associative properties.

Lesson 1.4

1. Explain the distributive property of multiplication over addition and give two examples of it.

2. Rewrite numeric expressions using the distributive property.

3. Evaluate numeric expressions using the distributive property.

Lesson 1.5

1. Define "like" terms and "unlike" terms and give two examples of expressions containing each type of term.

2. Combine like terms by using the distributive property.

3. Simplify expressions by combining like terms.

4. Simplify expressions and evaluate them for the given value of the variables.

Lesson 1.6

1. Define "product," "factor," "base," amd "power" and give two examples of each term.

2. Write the expanded form of expressions in power form.

3. Write the power form of expressions in expanded form.

4. Evaluate expressions containing a power for given values of the variables.

Lesson 1.7

1. Explain "perimeter," "area," and "volume" and draw an example of each term.

2. Draw a rectangle, square, triangle, circle, rectangular solid, and cylinder and label the dimensions of each figure with variables.

3. Evaluate geometric formulas for given values of the variables using algebraic expressions and the rules of algebra.

Lesson 2.0

1. Describe the sets of numbers: naturals, wholes, integers, rationals, irrationals, reals.

2. Perform algebraic operations using the order of operations.

3. Define the terms "variable," "term," "coefficient," "algebraic expression."

4. Use the commutative, associative, and distributive properties to simplify expressions and to compute problems.

5. Expand and rewrite expressions using factors and powers.

6. Apply algebraic expressions in the computation of perimeter, area, and volume.

Lesson 2.1

1. Identify and draw the origin, positive numbers, and negative numbers on a number line.

2. Use integers to describe word phrases such as "below," "gain," "above," "drop," and "loss."

3. Define absolute value and find the absolute value of any integer.

4. Add the absolute values of integers.

5. Evalute absolute values given a value for the variables.

6. Use the order of operations to combine like terms with algebraic and numeric expressions within the absolute value sign.

Lesson 2.2

1. Add integers with like signs.

2. Add integers with unlike signs.

Lesson 2.3

1. Define the following properties applied to the addition of integers:

   a. Commutative Property
   b. Associative Property
   c. Additive Identity Property
   d. Additive Inverse Property

2. Use the properties listed above in the addition of integers.

Lesson 2.4

1. Change subtraction problems into equivalent addition problems

2. Subtract integers by using the properties of addition.

Lesson 2.5

1. Add integers by grouping like signs before computing.

2. Group like signs mentally to simplify adding integers.

Lesson 2.6

1. Multiply integers with like signs.

2. Multiply integers with unlike signs.

3. Use the commutative and associative properties to do quick mental multiplication of integers.

4. Know the sign of an answer involving raising a negative integer to an even power.

5. Know the sign of an answer involving raising a negative integer to an odd power.

Lesson 2.7

1. Divide integers with like signs.

2. Divide integers with unlike signs.

Lesson 2.8

1. Rewrite subtraction problems as addition problems before evaluating.

2. Evaluate variable expressions with one, two, or three variables.

3. Use the distributive property to simplify an expression with variables before evaluating it.

Lesson 2.9

1. Simplify expressions with integer and whole number coefficients by combining like terms.

2. Use the distributive property to combine like terms.

3. Use the multiplication property of 1 to help combine like terms and and to evaluate algebraic expressions given values of the variables.

4. Use the multiplication property of -1 to help combine like terms and to evaluate algebraic expressions given values of the variables.

Lesson 2.10

1. Simplify expressions with a negative multiplier outside of parentheses by using the distributive property.

2. Simplify expressions by multiplying by -1 when just the negative sign precedes the parentheses.

3. Write and simplify expressions of the form *"from a, subtract b"* and *"subtract b from a."*

Lesson 3.0

1. State the definition of absolute value.

2. Distinguish between like and unlike signs in an algebraic expression.

3. Apply the rules of addition, subtraction, multiplication, and division of integers in algebraic expressions.

4. Simplify and evaluate algebraic expressions for given values of the variables.

Lesson 3.1

1. Define open algebraic sentences.

2. Define "solution" as related to algebraic sentences.

3. Describe the concept of empty set as it relates to the solution of an algebraic sentence.

4. Define and give an example of an equation.

5. Define equivalent equations.

6. Write an equation and two examples of equations that are equivalent to it.

7. Solve equations of the form $x + a = b$.

Lesson 3.2

1. Define the multiplication property for equations.

2. Create an equivalent equation by multiplying both sides of an equation by a non-zero number.

3. Define a rational number.

4. Solve equations by dividing both sides by a non-zero number or multiplying both sides by the reciprocal of a non-zero number.

5. Solve equations of the form $ax = b$.

Lesson 3.3

1. Combine like terms to get just one variable term in an equation.
2. Use more than one property of equations to solve problems.

Lesson 3.4

1. Transform equations so that the variable only appears on the right side.
2. Transform equations so that the variable only appears on the left side.
3. Solve equations where the variable is on both sides.

Lesson 3.5

1. Apply the distributive property to remove parentheses in an equation.
2. Solve equations with parentheses by applying the distributive property.

Lesson 3.6

1. Use the following key words and punctuation marks to change phrases into numeric or algebraic expressions:

   a. "decreased by" (subtraction)
   b. "increased by" (addition)
   c. "less than" (reverse the order and subtract)
   d. "more than" (reverse the order and add)
   e. "times" (multiply)
   f. "is" (equals)
   g. a comma (separates terms or factors in a word phrase)

2. Convert word phrases into mathematical terms.
3. Convert word phrases into algebraic symbols.

Lesson 3.7

1. Use the following steps to solve word problems:

   a. choose a variable
   b. plan and write an equation
   c. solve the equation
   d. check the solution

2. Solve simple word problems.

Lesson 3.8

1. Use the following steps to solve word problems that express one number in terms of another number:

   a. determine which number to represent by a variable
   b. represent the other number in terms of that variable
   c. write the equation which shows the relationship between the two numbers
   d. solve the equation
   e. check the solution

2. Solve simple word problems.

Lesson 3.9

1. Draw rectangles, triangles, and isosceles triangles and label their dimensions with variables.

2. Write equations using the formulas for the perimeter of a rectangle, triangle, and isosceles triangle.

3. Solve word problems involving the perimeters of rectangles and various types of triangles.

Lesson 4.0

1. Define "open sentence," "solution," and "equivalent equation" and give two examples of each term.

2. Explain the addition property for equations.

3. Explain the multiplication property for equations.

4. Use the addition and multiplication properties to solve equations.

5. Convert key words and punctuation marks to mathematical symbols.

6. Explain the steps to solve word problems.

7. Solve simple word problems.

Lesson 4.1

1. Explain how to read variables with powers and give two examples.

2. Explain the product of powers rule and give an example of it.

3. Simplify algebraic expressions containing variables raised to a power by using the product of powers rule.

4. Use the commutative and associative properties to simplify algebraic expressions containing variables raised to a power.

5. Evaluate algebraic expression containing variables raised to a power for given values of the variables.

6. Explain the power of a power rule and give an example of it.

7. Simplify algebraic expressions containing variables raised to a power by using the power of a power rule.

8. Explain the power of a product rule and give an example of it.

9. Simplify algebraic expressions containing variables raised to a power by using the power of a product rule.

Lesson 4.2

1. Define "monomial" and give two examples of it.
2. Identify various types of monomials.
3. Define "degree of a monomial" and give two examples.
4. Find the degree of monomials.
5. Define "polynomial" and give two examples of it.
6. Label polynomials as monomials, binomials, or trinomials.
7. Define "degree of polynomial" and give two examples.
8. Identify the degree of polynomials.
9. Simplify algebraic expressions and write answers in descending order of exponents.

Lesson 4.3

1. Add polynomials.
2. Subtract polynomials.
3. Perform addition and subtraction on polynomials.

Lesson 4.4

1. Simplify algebraic expressions by using the distributive property and combining like terms when multiplying a monomial by a polynomial.
2. Multiply a monomial by a polynomial.

Lesson 4.5

1. Define "prime number" and give two examples.
2. Explain "prime factorization" of a number.
3. Factor numbers into prime numbers.
4. Find a missing factor by using the power of products property.

Lesson 4.6

1. Define "greatest common factor" and give two examples.

2. Factor out the greatest common numerical factor from an algebraic expression.

3. Factor out the greatest common variable factor from an algebraic expression.

4. Factor out the greatest common factor from an algebraic expression.

Lesson 5.0

1. Explain the product of powers, power of a power, and power of a product properties of exponents and give an example of each property.

2. Give an example of a monomial, binomial, trinomial, and polynomial.

3. Identify the degree of polynomials.

4. Add polynomials by grouping and combining like terms in descending order of exponents.

5. Subtract polynomials by adding the opposite of each term, grouping, and combining like terms in descending order of exponents.

6. Multiply a polynomial by a monomial.

7. Simplify algebraic expressions containing exponents.

8. Find the missing factors in algebraic expressions containing exponents.

9. Factor simple algebraic expressions.

Lesson 5.1

1. Multiply two binomials by using the distributive property.

2. Use the FOIL method to multiply two binomials.

3. Square binomials by using the FOIL method.

4. Multiply any two polynomials by using the distributive property.

Lesson 5.2

1. Factor trinomials into two binomials.

2. Explain what signs the two binomial factors will have if the third term is positive after factoring a trinomial.

3. Explain what signs the two binomial factors will have if the third term is negative after factoring a trinomial.

Lesson 5.3

1. Factor trinomials in which the x^2 coefficient is not 1.
2. Use trial and error and knowledge of signs to find the correct combination of factors when the x^2 coefficient is not 1.
3. Factor polynomials with two variables.

Lesson 5.4

1. Factor a perfect trinomial square into the square of a binomial.
2. Factor the difference of two squares into a product of two binomials.

Lesson 5.5

1. Factor polynomials of combined types.

Lesson 5.6

1. Factor polynomials by grouping terms having a common factor and then factoring out all common factors.
2. Factor polynomials completely.

Lesson 5.7

1. Explain "quadratic equation" and give an example of this type of equation.
2. Explain the zero product property and give an example of the property.
3. Solve quadratic equations by factoring and applying the zero product property.
4. Determine the number of roots a quadratic, cubic, or higher degree equation will have.
5. Explain "double roots" and give an example.
6. Explain what is meant by "the standard form of an equation" and arrange equations in standard form.
7. Solve simple word problems that result in quadratic equations.

Lesson 5.8

1. Define "consecutive integers" and give two examples of three integers each.

2. Define "consecutive odd integers" and "consecutive even integers" and give an example of three integers for each type of consecutive integers.

3. Solve consecutive integer word problems

3. Check roots of an equation to be sure they satisfy the conditions of the original word problem.

Lesson 6.0

1. Use the FOIL method to multiply binomials.
2. Multiply any polynomials.
3. Factor quadratic trinomials.
4. Factor perfect trinomial squares.
5. Factor the difference of two squares.
6. Factor polynomials by grouping.
7. Explain the zero product property and give an example.
8. Solve quadratic equations.

Lesson 6.1

1. Define "rational expression" and give two examples.
2. Explain when a rational expression is undefined and give two examples.
3. Find the values of a variable for which a rational expression is undefined.
4. Multiply two rational expressions.

Lesson 6.2

1. Explain when two polynomials are "relatively prime."
2. Explain when a rational expression is in simple form and give an example of a rational expression in simple form and one that is not in simple form.
3. Simplify rational expressions.

Lesson 6.3

1. Explain when a polynomial is in "practical form" and give an example of a polynomial in practical form and one that is not in practical form.
2. Explain how to make the leading coefficient positive by factoring out a -1.

3. Write polynomials in practical form.

4. Simplify rational expressions after first writing them in practical form.

Lesson 6.4

1. Simplify rational expressions by cancelling out all factors common to numerator and denominator.

2. Simplify rational expressions containing exponents by expanding powers and cancelling like factors.

3. Simplify rational expressions by factoring out -1 where needed.

4. Explain the quotient of powers property.

5. Simplify rational expressions by using the quotient of powers property.

Lesson 6.5

1. Simplify a product of two or more rational expressions by writing the product of their numerators divided by the product of their denominators and cancelling out common factors.

2. Simplify products of rational expressions.

Lesson 6.6

1. Explain the "reciprocal" or "multiplicative inverse" of a rational expression and give two examples.

2. Demonstrate that the product of any quantity and its reciprocal is 1.

3. Write the reciprocal of any number or expression.

4. Simplify a rational expression divided by another rational expression by multiplying the first expression by the reciprocal of the second expression.

5. Simplify rational expressions that include multiplication and division by following the order of operations.

Lesson 6.7

1. Demonstrate two ways of writing division problems involving rational expressions.

2. Divide monomials with coefficients other than 1.

3. Divide any polynomial by a monomial.

Lesson 6.8

1. Divide a polynomial by a binomial by following the rules of "long division."

2. Use a "0" for the coefficient of a missing term when dividing a polynomial by a binomial.

3. Divide any polynomial by any binomial.

Lesson 7.0

1. Define "rational expression" and give an example.
2. Explain when a rational expression is undefined and give an example.
3. Find the values of the variables for which a rational expression is undefined.
4. Multiply rational expressions.
5. Simplify rational expressions by factoring and cancelling out like terms.
6. Explain the quotient of powers property and give an example.
7. Define "reciprocal" or "multiplicative inverse" and give two examples of the reciprocals of numbers or algebraic expressions.
8. Divide rational expressions.
9. Divide a polynomial by a monomial.
10. Divide a polynomial by a polynomial of a lower degree.

Lesson 7.1

1. Explain the addition property for rational expressions and give an example.
2. Add rational expressions with like denominators.
3. Simplify rational expressions after adding them.
4. Add more than two rational expressions.
5. Add rational expressions with unlike denominators.
6. Define lowest common denominator (LCD) and give an example.
7. Add rational expressions and then simplify the answers.

Lesson 7.2

1. Add rational expressions with polynomial denominators.
2. Identify the LCD for rational expressions with polynomial denominators.
3. Add rational expressions with polynomial denominators and then simplify the answers.

Lesson 7.3

1. Identify the LCD when adding rational expressions.
2. Add integers to rational expressions.
3. Add polynomials to rational expressions.
4. Add rational expressions having monomial denominators involving powers.
5. Add rational expressions with monomial denominators involving powers and then simplify the answers.

Lesson 7.4

1. Subtract one rational expression from another rational expression.
2. Subtract rational expressions and then simplify the answers.

Lesson 7.5

1. Rewrite denominators in practical form by factoring out -1.
2. Write subtraction problems in three different forms.
3. Simplify rational expressions that include both addition and subtraction operations in the same problem.
4. Simplify rational expressions that include more than one addition and subtraction operation in the same problem.

Lesson 7.6

1. Give two examples of complex fractions.

2. Give two examples of complex rational expressions.

3. Simplify rational expressions using Method A (order of operations).

4. Simplify rational expressions using Method B (LCD).

5. Simplify rational expressions using the method that is easiest for each problem.

Lesson 7.7

1. Simplify complex rational expressions with one polynomial denominator.

2. Simplify complex rational expressions with more than one polynomial denominator.

3. Identify the LCD of all denominators when simplifying complex rational expressions.

4. Simplify complex rational expressions.

Lesson 8.0

1. Explain the addition property for rational expressions.
2. Find the lowest common denominator when adding rational expressions.
3. Add rational expressions with like denominators.
4. Add rational expressions with unlike denominators.
5. Subtract rational expressions.
6. Simplify complex rational expressions by following the order of operations.
7. Simplify complex rational expressions by finding the LCD.

Lesson 8.1

1. Explain what a ratio is and give two examples.
2. Write the two examples of ratios (as above) in two forms.
3. Explain what a proportion is and give two examples.
4. Identify the "means" and "extremes" in the two examples of proportions (as above).
5. Solve proportions involving a single variable by multiplying by their LCD.
6. Solve proportions involving a single variable by cross multiplying.
7. Demonstrate that in a proportion the product of the extremes equals the product of the means.
8. Use proportions for solving word problems.

Lesson 8.2

1. Explain the multiplication rules for fractions and give an example of each rule.
2. Explain the multiplication property of equations.
3. Eliminate fractions from equations by multiplying every term on both sides by their LCD.
4. Solve equations with fractions.
5. Solve word problems with fractions.

Lesson 8.3

1. Change a repeating decimal to a fraction.
2. Change a terminating decimal to a fraction.
3. Eliminate decimals in terminating decimals by multiplying by the correct power of 10.
3. Solve equations with repeating decimals.
4. Solve equations with terminating decimals.

Lesson 8.4

1. Explain "percent" and give three forms of a percent example.
2. Convert a percent to a decimal or a common fraction.
3. Solve word problems involving percents.

Lesson 8.5

1. Identify the LCD for all rational expressions in an equation.
2. Solve equations containing one or more rational expressions.
3. Put quadratic equations in standard form.
3. Explain what "extraneous solutions" or "extraneous roots" are.
4. Check for extraneous solutions whenever a denominator contains a variable.

Lesson 8.6

1. Explain what fraction of a job can be completed in n hours if the whole job can be completed in x hours.

2. Demonstrate that the total work done is the *sum* of the fractional parts done by each worker.

3. Design a table to keep track of data in a word problem involving work.

4. Solve work problems.

Lesson 8.7

1. Define "literal equation" and give two examples.

2. Solve literal equations in terms of any one of the variables in the equation.

3. Use the formula for converting Celcius temperature to Fahrenheit to solve equations.

4. Multiply by the LCD of all the fractions to clear the fractions in a literal equation.

5. Move all terms containing like variables to one side of a literal equation.

6. Solve literal equations and then substitute values for designated variables.

Lesson 8.8

1. Explain the formula for uniform motion problems: $d = rt$.

2. Design a table to represent the data in uniform motion problems.

3. Solve uniform motion problems.

Lesson 9.0

1. Define "ratio," "proportion," and "percent" and give two examples of each term.
2. Identify the "means" and "extremes" in a proportion.
3. Demonstrate that the product of extremes equals the product of means in a proportion.
4. Solve equations with fractions by multiplying both sides by the LCD.
5. Solve equations with decimals.
6. Clear fractions when solving rational equations.
7. Explain what "extraneous roots" are.
8. Solve three basic types of percent problems.
9. Solve word problems involving percents.

Lesson 9.1

1. Define "finite set" and give two examples using numbers.
2. Define "infinite set" and give two examples using numbers.
3. Identify a set as finite or infinite.
4. Show a set by rule.
5. Show a set by roster (or list).
6. Show a set by graph.
7. Define "empty set" and give two examples using numbers.
8. Define "replacement set."
9. Define "solution set."
10. Find the solution set for an equation.
11. Define the solution set for an equation by rule and by list.
12. Graph the solution set for an equation.

Lesson 9.2

1. Explain the three relationships any number a can have to any number b.
2. Compare two numbers in words.
3. Compare two numbers in mathematical symbols.
4. Write an inequality using mathematical symbols.
5. Explain the following symbols: $<$, $>$, $=$, $\neq$, $\leq$, $\geq$.
6. Rewrite an inequality with the variable on the left.
7. Describe in words the solution set of an inequality.
8. Graph the solution set of an inequality.

Lesson 9.3

1. Explain the addition property of order involving inequalities and give one example.
2. Explain the subtraction property of order involving inequalities and give one example.
3. Explain the multiplication properties of order involving inequalities and give one example of multiplying by a positive number.
4. Explain the multiplication properties of order involving inequalities and give one example of multiplying by a negative number.
5. Explain the division properties of order involving inequalities and give one example of dividing by a positive number.
6. Explain the division properties of order involving inequalities and give one example of dividing by a negative number.
7. Identify what operation was performed on each side of one equation to obtain a given second equation.
8. Perform a mathematical operation on each side of an equation and write the result.

Lesson 9.4

1. Explain when to reverse the order of the inequality when solving inequalities.

2. Solve an inequality.

3. Graph the solution set of an inequality.

4. Transform an inequality with fractions into one without fractions.

5. Solve an inequality with fractions.

6. Graph the solution set of an inequality that has all numbers as its solution set.

7. Graph the solution set of an inequality that has the empty set as its solution set.

Lesson 9.5

1. Explain "conjunction" and give one example of the term.

2. Describe the solution set for a conjunction.

3. Define "intersection" in relation to "conjunction."

4. Solve a conjunction.

5. Graph the solution set of a conjunction.

6. Convert a conjunction into a three-member inequality.

7. Explain "disjunction" and give one example of the term.

8. Describe the solution set for a disjunction.

9. Define "union" in relation to "disjunction."

10. Solve a disjunction.

11. Graph the solution set of a disjunction.

12. Explain why a disjunction cannot be written as a three-member inequality.

13. Solve a three-member inequality.

14. Graph the solution set of a three-member inequality.

15. Use set notation to describe the solution set of a conjunction.

16. Use set notation to describe the solution set of a disjunction.

Lesson 9.6

1. Depict the absolute value of a number on a number line.

2. Solve an equation involving the absolute value of a number.

3. Solve an equation involving the absolute value of an algebraic expression.

4. Transform an equation so that the absolute value is the only expression on one side.

5. Explain why the solution of an equation involving an absolute value can never be negative.

6. Explain the solution set of an equation when the answer appears to result in an absolute value being a negative number.

Lesson 9.7

1. Demonstrate that the solution to an inequality using absolute value with "<" is a conjunction.

2. Solve an inequality involving an absolute value with "<".

3. Graph the solution set of an inequality involving an absolute value with "<".

4. Solve an inequality involving an absolute value with "≤".

5. Graph the solution set of an inequality involving an absolute value with "≤".

6. Demonstrate that the solution to an inequality using absolute value with ">" is a disjunction.

7. Solve an inequality involving an absolute value with ">".

8. Graph the solution set of an inequality involving an absolute value with ">".

9. Solve an inequality involving an absolute value with "≥".

10. Graph the solution set of an inequality involving an absolute value with "≥".

11. Isolate the absolute value expression on one side of an inequality before solving it.

12. Solve an inequality involving absolute value.

13. Graph the solution set of an inequality involving absolute value.

Lesson 10.0

1. Define the following types of sets and give one example of each set: finite, infinite, empty, replacement, solution.

2. Write a set in roster form and then graph it on a number line.

3. Graph the solution set of an inequality on a number line.

4. Demonstrate that the order of the inequality changes when both sides are multiplied or divided by a negative number.

5. Explain what a "conjunction" is and give one example.

6. Solve a conjunction.

7. Graph the solution set of a conjunction.

8. Explain what a "disjunction" is and give one example.

9. Solve a disjunction.

10. Graph the solution set of a disjunction.

11. Explain "absolute value" and give two examples.

12. Solve an inequality that involves absolute value.

13. Graph the solution set of an inequality that involves absolute value.

Lesson 10.1

1. Identify points on a number line.

2. Draw a Cartesian (Rectangular) Coordinate System.

3. Locate the *x-axis, y-axis,* and *origin* on a coordinate sytem.

4. Locate the positive x values on a coordinate system.

5. Locate the positive y values on a coordinate system.

6. Locate the negative x values on a coordinate system.

7. Locate the negative y values on a coordinate system.

8. Locate ordered pairs on a coordinate system.

9. Plot points on a coordinate system, given ordered pairs of numbers.

10. Name the ordered pair that is represented by a point on a graph.

11. Define "abscissa," "ordinate," and "coordinates of a point."

12. Identify the quadrant where a point is located.

13. Explain how to know which direction to go when plotting points.

14. Plot a point when one of its coordinates is 0.

Lesson 10.2

1. Represent the root or solution of an equation by an ordered pair of numbers.

2. Make a table of ordered pairs that are solutions of an equation.

3. Plot points on a coordinate system.

4. Draw the graph of an equation on a coordinate system.

5. Transform an equation into an equivalent equation having y as one member.

6. Demonstrate whether or not a given ordered pair of numbers is a root of an open sentence.

Lesson 10.3

1. Define "slope" and draw an example of the term.

2. Define "rise" and "run" as the terms relate to "slope."

3. Find the slope of a line segment, given the coordinates of two points on the segment.

4. Explain the standard form for the slope of a line segment.

5. Demonstrate the slope of a horizontal segment by drawing it on a coordinate system and by using the algebraic standard form for slope.

6. Demonstrate that the slope of a line is the same as the slope of any line segment belonging to the line.

7. Draw the slope of a line when the slope is *positive*.

8. Draw the slope of a line when the slope is *negative*.

9. Demonstrate the slope of a vertical segment by drawing it on a coordinate system and by using the algebraic standard form for slope.

10. Demonstrate that parallel lines have the same slope by drawing lines on a coordinate system and by using the algebraic standard form for slope.

11. Determine if two lines are parallel.

12. Determine if three points are on the same line.

Lesson 10.4

1. Explain how to determine the equation of a given line.

2. Explain the standard equation for a line: $y = mx + b$.

3. Put the equation for a line into standard form.

4. Determine the equation of a line, given the coordinates of two points on the line.

5. Substitute the x and y values of given coordinates into an equation to show that the equation is the correct one for a line.

6. Determine if a given point is on the line that is described.

7. Determine if a third point is on a line.

8. Find the y coordinate of a point on a line if the x coordinate is given.

Lesson 10.5

1. Explain each element of the standard form of the equation of a line (the slope-intercept form): $y = mx + b$.

2. Graph the equation of a line to demonstrate the slope and y -intercept.

3. Find the slope and y -intercept of a line, given the linear equation.

4. Write the equation of a line, given the slope and y -intercept.

5. Graph a line, given the slope-intercept form of the linear equation.

6. Rewrite an equation in slope-intercept form.

Lesson 10.6

1. Graph a horizontal line, given its linear equation.

2. Explain why a vertical line does not have an equation in slope-intercept (standard) form.

3. Explain what is meant by "undefined slope" as related to a vertical line.

4. Explain the standard equation for a vertical line.

5. Graph a vertical line, given its standard equation.

Lesson 10.7

1. Draw a coordinate system with a line through it; explain how the regions on each side of the line are represented by an inequality.

2. Describe the four possible inequality situations by drawing coordinate systems and shading the appropriate region.

3. Rewrite an inequality in slope-intercept form.

4. Graph an inequality.

5. Explain how to determine if the boundary line of a graph of an inequality is solid or dashed.

6. Explain how to determine if the graph of an inequality is on the right on left side of the boundary line.

7. Determine if a point is on the graph by drawing the graph and plotting the point.

8. sDetermine if a point is on the graph by substituting the values into the equation.

Lesson 11.0

1. Draw a coordinate system and indicate the y - axis, x - axis, origin, all quadrants, where x and y values are positive, and where x and y values are negative.
2. Design a table that shows sets of ordered pairs that are on a line.
3. Graph an equation.
4. Define "slope" of a line.
5. Find the slope of a line, given the coordinates of two points.
6. Draw the positive slope of a line, the negative slope of a line, the slope of a horizontal line, and the slope of a vertical line.
7. Demonstrate that parallel lines have the same slope.
8. Explain the standard form of a line.
9. Explain the slope-intercept form of a line.
10. Use the two-point form of a linear equation to find the slope of a line.
11. Draw the four conditions of inequality on a coordinate system.
12. Plot points on a coordinate system.
13. Determine if two lines are parallel.
14. Find the equation of a line, given the slope and y-intercept.
15. Give the slope and y-intercept of a line.
16. Change an equation into slope-intercept form.
17. Graph an inequality.

Lesson 11.1

1. Define "ordered pairs," "relation," "domain," "range," and "function."
2. Identify the domain and range of a relation.
3. Determine if a relation is a function.

Lesson 11.2

1. Define "function," "linear function," and "constant function."
2. Draw a sketch of a function, a linear function, a constant function, and a relation that is not a function.
3. Use the vertical line test to determine if a graph is a function.
4. Graph an equation and indicate if it is a function. (If a function, indicate if it is linear, constant, or neither.)

Lesson 11.3

1. Use correct notation for naming a function and its values.
2. Identify the domain and range values for a function.
3. Use an equation to describe a function.
4. Find the range of a function, given the domain and equation of a function.
5. Find the indicated value for a given function.

Lesson 11.4

1. Define "direct variation" and give one example of the term.
2. Define "constant of variation."
3. Write a proportion that indicates that y varies directly as x.
4. Derive an equation from a proportion that represents a direct variation.
5. Determine if y varies directly as x in an equation.
6. Identify the constant of variation in an equation.
7. Explain when the ratios of two ordered pairs of a direct variation are equal.
8. Develop a table of values that illustrates y varying directly as x.
9. Find the missing value of two ordered pairs when a direct variation exists between x and y.
10. Solve word problems involving direct variation.

Lesson 11.5

1. Define "inverse variation" and give one example of the term.

2. Determine if y varies inversely as x.

3. Identify the constant of variation in an equation.

4. Develop a table of values that illustrates y varying inversely as x.

4. Find a missing value of two ordered pairs when an inverse relationship exists between x and y.

5. Solve word problems involving inverse relationships.

Lesson 11.6

1. Design a table of values to show the relationship between ages.

2. Solve word problems involving age.

Lesson 12.0

1. Define "relation," "function," "domain," "range," "linear function," and "constant function."

2. List the domain and range of a relation.

3. Use the vertical line test to determine whether or not a graph is a function.

4. Demonstrate function notation.

5. Find a function value, given a function.

6. Explain "direct variation" and give one example of a word problem using direct variation.

7. Explain "inverse variation" and give one example of a word problem using inverse variation.

8. Determine if a list of numbers represents a direct variation, inverse variation, or neither.

9. Identify the constant of variation in a direct variation.

10. Identify the constant of variation in an inverse variation.

11. Solve word problems involving age situations.

12. Solve word problems using direct variation.

13. Solve word problems using inverse variation.

Lesson 12.1

1. Graph a system of equations.

2. Estimate the solutions of a system of equations from its graph.

3. Check the solutions of a system of equations by substituting the values back in the original equations.

4. Define a system of equations that is "independent and consistent."

5. Solve by graphing an independent and consistent system of equations.

6. Define a system of equations that is "independent and inconsistent."

7. Solve by graphing an independent and inconsistent system of equations.

8. Define a system of equations that is "dependent and consistent."

9. Solve by graphing a dependent and consistent system of equations.

10. Determine whether a system of equations is independent and consistent, independent and inconsistent, or dependent and consistent by graphing it.

Lesson 12.2

1. Explain how to tell if a boundary line in a single inequality will be solid or dashed.

2. Explain how to tell which side of a bounday line in a single inequality to shade.

3. Graph an example of an inequality with each of the following signs: $<$, $>$, $\leq$, $\geq$.

4. Solve a system of inequalities by graphing it.

5. Locate one point in the shaded solution area of a system of inequalities that is a solution to the system.

Lesson 12.3

1. Solve a system of equations by substitution.

2. Determine which equation in a system of equations must be solved for one of its variables first.

3. Check the solutions by substituting them in the original equations.

Lesson 12.4

1. Solve a system of equations by the addition method.
2. Rewrite equations with both variables on the same side in each equation.
3. Check the solutions by substituting them in the original equations.
4. Solve word problems that are systems of equations.

Lesson 12.5

1. Solve a system of equations by using multiplication and addition.
2. Use multiplication to make the coefficients of like terms additive inverses.
3. Eliminate either the y terms or the x terms in a system of equations.
4. Solve word problems that are systems of equations.

Lesson 12.6

1. Solve word problems involving two quantities.
2. Check solutions in the original equations.

Lesson 12.7

1. Represent the value of different coins in the same unit.
2. Solve word problems involving money.
3. Solve word problems involving mixture situations.

Lesson 12.8

1. Represent two-digit numbers in terms of *tens* and *units* .
2. Solve word problems involving two-digit numbers.

Lesson 13.0

1. Demonstrate the steps for solving a system of equations graphically.
2. Solve a system of equations by graphing.
3. Explain systems of equations that are "independent and consistent," "independent and inconsistent," and "dependent and consistent."
4. Solve a system of inequalities by graphing.
5. Solve a system of equations by substitution.
6. Solve a system of equations by the addition method.
7. Solve a system of equations by the multiplication-addition method.
8. Determine if a system of equations is dependent or independent, consistent or inconsistent.
9. Solve word problems by writing and solving a system of equations.

Lesson 13.1

1. Describe the following sets of numbers: natural numbers, whole numbers, integers.
2. Explain what a "rational number" is.
3. Demonstrate that whole numbers, integers, common fractions, and decimals can be written in the form of a rational number.
4. Verify that a given number is a rational number.
5. Demonstrate the notation for a repeating decimal.
6. Write rational numbers as repeating or terminating decimals.
7. Find the fraction for a repeating decimal.

Lesson 13.2

1. Explain the difference between rational numbers and irrational numbers.
2. Give two examples of rational numbers and two examples of irrational numbers.
3. Determine whether a real number is rational or irrational.
4. Predict the next group of digits in an irrational number that demonstrates a pattern.
5. Explain the relationship of real, rational, and irrational numbers.

Lesson 13.3

1. Square a number.
2. Explain what the "square roots" of a real number are.
3. Explain what the "principal square root" of a real number is and give two examples.
4. Explain square root notation (the radical sign and radicand) and give two examples.
5. Explain what a "perfect square" is and give two examples.
6. Demonstrate that a given number is a perfect square.
7. Find the principal square root of a perfect square.
8. Explain the difference in the square roots of a whole number that is perfect square and a whole number that is not a perfect square.
9. Find the approximation of the square root of an integer that is not a perfect square by using a square root table.
10. Find the approximation of the square root of an integer that is not a perfect square by using a calculator.
11. Find the approximation of the square root of an integer that is not a perfect square by using pencil and paper.
12. Solve word problems involving area (round the answers to the nearest tenth).

Lesson 13.4

1. Explain the "square root of a product" property and give two examples.

2. Simplify the product of two square roots.

3. Simplify the square root of a product.

4. Explain the "product of the square roots of the same number" property and give two examples.

5. Simplify the square root of a number by factoring it into primes.

6. Simplify the square root of a number by finding the greatest perfect square.

7. Simplify numbers involving square roots (approximate answers to the nearest tenth).

Lesson 13.5

1. Explain why the square root of a negative number is not a real number.

2. Evaluate radical expressions for a given value of a variable.

3. Determine for what values of the variable a radical will be a real number.

4. Simplify radicals containing variables raised to a power.

5. Explain how to find the square root of a variable raised to an even power and give two examples.

6. Find the square root of a radical containing a variable raised to an even power.

7. Explain how to find the square root of a variable raised to an odd power and give two examples.

8. Find the square root of a radical containing a variable raised to an odd power.

9. Simplify complex expressions containing radicals.

Lesson 13.6

1. Add radicals by using the distributive property.

2. Subtract radicals by using the distributive property.

3. Simplify radicals by the factoring method.

4. Simplify radicals by using the greatest perfect square factor method.

Lesson 13.7

1. Simplify products involving square roots by using the commutative and associative properties.

2. Explain the two properties of multiplication of radicals and give two examples of each property.

3. Simplify the product of a monomial and a polynomial.

4. Multiply two binomials that contain radicals by using the FOIL method.

5. Square a binomial that contains radicals by using the FOIL method.

Lesson 13.8

1. Explain the quotient property of square roots and give two examples of the property.

2. Remove all radicals from the denominator of a fraction by rationalizing the denominator.

3. Simplify radical expressions that are fractions by multiplying both numerator and denominator by the square root in the denominator.

4. Simplify radical expressions that are fractions by multiplying the numerator and denominator by the least square root needed to make the denominator a perfect square.

5. Divide expressions containing radicals by the easiest method.

Lesson 13.9

1. Draw a right triangle and demonstrate the location of its 90^{o} angle, hypotenuse, and legs.

2. Explain the equation for the Pythagorean Theorem.

3. Use the Pythagorean Theorem to find the hypotenuse of a right triangle.

4. Use the Pythagorean Theorem to find the missing length of a side of a right triangle.

5. Explain what the converse of a statement is and give an example in algebra.

6. Use the converse of the Pythagorean Theorem to show that a triangle is a right triangle.

7. Solve word problems involving right triangles.

Lesson 14.0

1. Explain the following sets of numbers: real, rational, and irrational.

2. Give two examples each of a rational number, an irrational number, and a real number.

3. Explain the relationship of the real, rational, and irrational sets of numbers.

4. Identify a number as rational or irrational.

5. Convert numbers from decimal to rational form.

6. Find the square roots of numbers correct to three places.

7. Explain why the square root of a negative number is not a real number.

8. Explain what a perfect square is and give two examples of numbers that are perfect squares.

9. Simplify radical expressions.

10. Add radicals.

11. Subtract radicals.

12. Multiply radicals.

13. Divide radicals.

14. Demonstrate the Pythagorean Theorem by drawing a right triangle and labeling its parts.

15. Solve word problems involving right triangles.

Lesson 14.1

1. Explain what a "radical equation" is and give two examples.
2. Explain the steps to solving a radical equation.
3. Solve a radical equation.
4. Demonstrate with two examples that squaring both sides of an equation does not always give an equivalent equation.
5. Explain what "extraneous solutions" are.
6. Check solutions in the original equation to eliminate extraneous solutions.
7. Solve quadratic equations that result from squaring both sides of an equation.
8. Solve word problems involving radical equations.

Lesson 14.2

1. Solve equations of the form $x^2 = a$ by the factor method.
2. Solve equations of the form $x^2 = a$ by extraction of roots.
3. Solve equations where one member is a perfect square containing the variable by extraction of roots.
4. Simplify solutions as far as possible.
5. Solve word problems involving equations of the form $x^2 = a$.

Lesson 14.3

1. Explain what a "perfect square trinomial" is and give two examples.
2. Square a binomial.
3. Make a perfect square trinomial by adding a constant.
4. Solve quadratic equations by completing the square.
5. Solve quadratic equations of the form $ax^2 + bx + c = 0$ by dividing both sides by a first.

Lesson 14.4

1. Derive the quadratic formula.

2. Explain the steps to solving any quadratic equation.

3. Clear fractional coefficients or constants in a quadratic equation.
4. Solve quadratic equations.

5. Explain how many roots a quadratic equation may have and give an example of each type.

Lesson 14.5

1. Explain why problems involving area have only one root.

2. Solve area problems.

3. Check solutions of area problems in the original equation.

Lesson 14.6

1. Explain what a "parabola" is and sketch two examples of a parabola.

2. Define "axis of symmetry," "vertex," and "x-intercepts" and label a parabola with these terms.

3. Design a table of values to obtain points on the graph of a parabola.

4. Draw the graph of a parabola and label its vertex, axis of symmetry, and x - intercepts.

5. Find the vertex of a parabola algebraically.

6. Find the x -intercepts of a parabola algebraically.

7. Find the axis of symmetry of a parabola algebraically.

8. Find the y -intercepts of a parabola algebraically.

9. Explain how to tell if a parabola opens upward or downward.

Lesson 15.0

1. Solve a radical equation.

2. Solve an equation of the form $x^2 = a$.

3. Solve an equation by completing the square.

4. Solve an equation by using the quadratic formula.

5. Graph a parabola and find its vertex, axis of symmetry, y-intercepts, and x-intercepts.

6. Determine if the vertex of a parabola is a maximum or a minimum.

7. Solve word problems involving area.

Lesson 15.1

1. Explain what a "point" is in geometry and give its pictoral representation, label, and other facts describing it.

2. Explain what a "line" is in geometry and give its pictoral representation, label, and other facts describing it.

3. Explain what a "plane" is in geometry and give its pictoral representation, label, and other facts describing it.

4. Identify a given line by all possible names.

5. Define "space," "geometric figure," "collinear points," "noncollinear points," "coplanar points," and "noncoplanar points."

6. Identify collinear points, noncollinear points, coplanar points, and noncoplanar points on a given geometric figure.

7. Draw geometric figures and label points, lines, and planes.

Lesson 15.2

1. Define "congruent segment" and draw an example.
2. Draw the symbol for "congruent."
3. Demonstrate how to use a compass to construct congruent segments.
4. Identify congruent pairs of segments by using a ruler.
5. Identify congruent pairs of segments by using a compass.
6. Identify congruent pairs of segments on a number line.
7. Construct a segment congruent to a given segment.
8. Find the midpoint of a segment.

Lesson 15.3

1. Draw a "ray" and an "angle."
2. Draw the symbol for an angle.
3. Identify the vertex and sides of an angle.
4. Describe an "acute angle" and draw one example.
5. Describe a "right angle" and draw one example.
6. Describe an "obtuse angle" and draw one example.
7. Describe a "straight angle" and draw one example.
8. Identify an angle as acute, right, obtuse, or straight.
9. Demonstrate four ways that an angle can be labeled.
10. Label angles in a drawing.

Lesson 15.4

1. Describe "parallel lines" in geometric terms and draw one example of parallel lines and one example of nonparallel lines.

2. Describe "skew lines" in geometric terms and draw one example of skew lines and one example of lines that are not skew.

3. Identify pairs of lines, rays, or segments that are parallel.

4. Identify pairs of lines, rays, or segments that are skew.

Lesson 15.5

1. Define a "triangle" in geometric terms and draw one example, labeling its parts.

2. Describe the three classifications of triangle by length of sides.

3. Draw one example of each classification of triangle by length of side.

4. Describe the three classifications of triangle by measure of angle.

5. Draw one example of each classification of triangle by measure of angle.

6. Classify a triangle by length of side.

7. Classify a triangle by angle.

8. Classify a triangle by both length of side and angle.