Math 0980 Chapter Objectives

Chapter 1: Introduction to Algebra: The Integers.

1. Identify the place value of a digit.
2. Write a number in words or digits.
3. Write positive and negative numbers used in everyday situations.
4. Graph signed number on a number line
5. Use < and > symbols to compare integers.
6. Find the absolute value of integers.
7. Add integers.
8. Identify properties of addition.
9. Find the opposite of signed numbers.
10. Subtract integers.
11. Combine adding and subtracting integers.
12. Round Integers.
13. Use front end rounding to estimate answers in addition and subtraction.
15. Identify properties of multiplication.
16. Estimate answers to application problems involving multiplication.
17. Divide integers.
18. Identify properties of division.
19. Combine multiplying and dividing integers.
20. Estimate answers to application problems involving division.
21. Interpret remainders in division application problems.
22. Use exponents to write repeated factors.
23. Simplify expressions containing exponents.
24. Use order of operations.
25. Simplify expressions with fraction bars.

Chapter 2: Understanding Variables and Solving Equations

1. Identify variables, constants and expressions.
2. Evaluate variable expressions for given replacement values
3. Write properties of operations using variables.
4. Use exponents with variables.
5. Combine like terms, using the distributive property.
7. Use the distributive property to multiply.
8. Determine whether a given number is a solution of an equation.
9. Solve equations using the addition property of equality.
10. Simplify equations before using the addition property of equality.
11. Solve equations using the division property of equality.
12. Simplify equations before using the division property of equality.
13. Solve equations such as \(-x = 5\).
14. Solve equations using the distributive, addition and division properties.
Chapter 3: Solving Application Problems

1. Use the formula for perimeter to find the perimeter of a square and a rectangle.
2. Find the perimeter of a parallelogram, triangle and irregular shapes.
3. Use the formula for area to find the area of a rectangle, square, or parallelogram.
4. Solve application problems involving perimeter and area of rectangles, squares or parallelograms.
5. Translate word phrases into algebraic expressions.
6. Translate sentences into equations.
7. Solve application problems with one unknown quantity.
8. Solve application problems with two unknown quantities.

Chapter 4: Rational Numbers: Positive and Negative Fractions

1. Using a fraction to name the part of a whole that is shaded.
2. Identify numerators, denominators, proper fractions, and improper fractions.
3. Graph positive and negative fractions on a number line.
4. Find the absolute value of a fraction.
5. Write equivalent fractions.
6. Identify fractions written in lowest terms.
7. Write a fraction in lowest terms using common factors.
8. Write a number as a product of prime factors.
9. Write a fraction lowest terms using prime factorization.
10. Write a fraction with variables in lowest terms.
11. Multiply and divide signed fractions.
12. Multiply and divide fractions involving variables.
13. Solve application problems involving multiplying and dividing fractions.
14. Add and subtract like and unlike fractions.
15. Find the LCD for unlike fractions.
16. Add and subtract like and unlike fraction that contain variables.
17. Identify mixed numbers and graph them on a number line.
18. Rewrite the mixed numbers as improper fractions, or the reverse.
19. Estimate the answer and multiply or divide mixed numbers.
20. Estimate the answer and add or subtract mixed numbers.
21. Solve application problems containing mixed numbers.
22. Simplify fractions with exponents.
23. Use order of operations with fractions.
25. Use the addition and multiplication properties to solve equations containing fractions.
26. Solve application problems using equations containing fractions.
27. Find the area of a triangle.
28. Find the volume of a rectangular solid and a pyramid.

Chapter 5: Rational Numbers: Positive and Negative Decimals

1. Reading and writing decimal numbers.
2. Write decimals as fractions or mixed numbers.
3. Rounding decimal numbers
4. Adding and subtracting signed decimal numbers.
5. Multiplying signed decimal numbers.
6. Dividing signed decimal numbers.
7. Estimating answers for adding, subtracting, multiplying or dividing signed decimal numbers.
8. Use the order of operations with decimals.
9. Write fractions as equivalent decimals.
10. Compare the size of fractions and decimals.
11. Find the mean of a list of numbers
12. Find the median.
13. Find the mode.
14. Find the square roots of a number.
15. Find the unknown length in a right triangle.
16. Solve application problems involving right triangles.
17. Solve equations containing decimals using the addition, and division properties of equality.
18. Solve application problems involving equations with decimals.
19. Find the radius, diameter, circumference and area of a circle.
20. Find the volume of a cylinder.
21. Find the surface area of a rectangular solid.

Chapter 6: Ratio, Proportion and Line/Angle/Triangle Relationships

1. Write rations as fractions.
2. Solve ratio problems involving decimals or mixed numbers.
3. Solve ratio problems after converting units.
4. Write rates as fractions.
5. Find unit rates.
6. Find the best buy based on cost per unit.
7. Write proportions, and determine in are true or false.
8. Find the unknown number in a proportion.
9. Use proportions to solve application problems.
10. Identify lines, line segments and rays.
11. Identify parallel and intersecting and perpendicular lines.
12. Identify complementary and supplementary angles.

Chapter 7: Percent

1. Meaning of percent
2. Write percents as decimals and fractions and the reverse.
3. Identify the percent, whole and part.
4. Solve percent problems using the percent proportion.
5. Solve basic percent problems using the percent equation.
6. Solve percent application problems.
7. Solve problems involving percent of increase or decrease.
8. Find sales tax and total cost.
10. Find discount and sale price.
11. Calculate simple interest and the total amount due on loan.

Chapter 8: Measurement

1. Learn the basic measurement units in the English system.
2. Convert among measurements units using multiplication, division, and unit fractions.
3. Solve application problems using English measurement.
4. Learn basic metric units of length, capacity, and weight
5. Use unit fractions to convert among units.
6. Convert among metric units by moving decimal point.
7. Solve application problems involving metric measurements.
8. Use unit fractions to convert between metric and English units.
9. Learn common temperatures on the Celsius scale.
10. Convert temperatures using formulas and following the order of operations.

Chapter 9: Graphs

1. Plot a point, given the coordinates and find the coordinates, given a point.
2. Identify the four quadrants and determine which points lie within each one.
3. Graph linear equations in two variables.
4. Identify the slope of a line as positive or negative.

Chapter 10: Real Numbers, Equations, and Inequalities

1. Identify ration numbers, irrational numbers and real numbers.
2. Use the symbols ≠, =, ≤, ≥, <, > to compare real numbers.
3. Reverse the direction of an inequality statement.
4. Use the order of operations to simplify expressions with brackets.
5. Remove parentheses and simplify expressions using the distributive property.
6. Solve equations that have no solution or infinitely many solutions.
7. Solve equations by first clearing fractions and decimals.
8. Solve a formula for one variable, given the values of the other variables.
9. Solve a formula for a specified variable.
10. Graph the solutions of in inequalities on a number line.
11. Use the addition and multiplication properties of inequality.
12. Solve inequalities using both properties.
13. Use inequalities to solve application problems.

Chapter 11: Graphs of Linear equations and Inequalities in Two Variables

1. Interpret graphs.
2. Write a solution as an ordered pair.
3. Decide whether a given ordered pair is a solution of a given equation.
4. Complete ordered pairs for a given equation.
5. Complete a table of values.
6. Plot ordered pairs.
7. Graph linear equation by plotting ordered pairs.
8. Find intercepts.
9. Graph linear equations where the intercepts coincide.
10. Graph linear equations of the form $y = k$ or $x = k$.
11. Use a linear equation to model data.
12. Find the slope of a line given two points.
13. Find the slope from the equation of a line.
14. Use slope to determine whether two lines are parallel, perpendicular or neither.
15. Write an equation of line given its slope and y-intercept.
16. Graph a line given its slope and a point on the line.
17. Write an equation of a line given its slope and any point on the line.
18. Write an equation of a line given two points on the line.
19. Find an equation of a line that fits a data set.
20. Graph linear inequalities.

Chapter 12: Systems of Linear Equations and Inequalities

1. Decide whether a given ordered pair is a solution of a system.
2. Solve linear systems by graphing
3. Solve special systems by graphing.
4. Solve linear systems by substitution
5. Solve special systems.
6. Solve linear systems with fractions.
7. Solve linear systems by elimination.
8. Use elimination method to solve special systems.
9. Solve problems about unknown numbers.
10. Solve problems about quantities and their costs.
11. Solve mixture problems.
12. Solve distance, rate and time problems.
13. Solve systems of linear inequalities by graphing

Chapter 13: Exponents and Polynomials

1. Like terms.
2. Vocabulary of polynomials
3. Evaluate polynomials
4. Add, subtract polynomials
5. Review use of exponents.
6. Use product rule for exponents.
7. Use combinations of rules for exponents.
8. Use the rules for exponents in an application of geometry.
9. Multiply a monomial and polynomial
10. Multiply two polynomials
11. Multiply binomials by the FOIL method
12. Square binomials
13. Final greater powers of binomials.
14. Use 0 as an exponent.
15. Use negative numbers as exponents.
16. Use the quotient rule for exponents.
17. Divide a polynomial by a Monomial
18. Divide a polynomial by a polynomial.
19. Apply division to a geometry problem.
20. Express numbers in scientific notation.
21. Convert numbers in scientific notation to numbers without exponents.
22. Use scientific notation in calculations.
23. Solve application problems using scientific notation.

Chapter 14: Factory and Applications

1. Factor the greatest common factor (GCF)
2. Factor trinomials with a leading coefficient of 1
3. Factor trinomials after factoring out the GCF
4. Factor trinomials by grouping when the leading coefficient is not 1.
5. Factor trinomials using FOIL
6. Factor the difference of squares
7. Factor perfect square trinomials.
8. Solve quadratic equations by factoring.
9. Solve other equations by factoring.
10. Solve problems about geometric figures.
11. Solve problems about consecutive integers.
12. Solve problems using the Pythagorean theorem
13. Solve problems using given quadratic models.

Chapter 15: Rational Expressions and Applications.

1. Find the values of the variable for which a rational expression is undefined.
2. Find the numerical value of a rational expression
3. Write a rational expression in lowest terms.
4. Recognize equivalent forms of rational expressions.
5. Multiply rational expressions.
6. Find reciprocals.
7. Divide rational expressions.
8. Find the least common denominator for a group of fractions.
9. Rewrite rational expressions with given denominators.
10. Add and subtract rational expressions.
11. Simplify a complex fraction by writing it as a division problem
12. Simplify a complex fraction by multiplying numerator and denominator by the least common denominator.
13. Distinguish between operations with rational expressions and equations with terms that are rational expressions.
14. Solve equations with rational expressions.
15. Solve a formula for a specified variable.
16. Solve problems about numbers
17. Solve problems about distance, rate and time.
18. Solve problems about work.
Chapter 16: Roots and Radicals

1. Find square roots.
2. Decide whether a given root is rational, irrational, or not a real number.
3. Find decimal approximations for irrational square roots.
4. Use the Pythagorean formula.
5. Find higher roots.
7. Simplify radicals using the product and quotient rules.
8. Simplify radicals involving variables.
9. Simplify higher roots.
10. Add and subtract radicals.
11. Simplify radical sums and differences.
12. Simplify more complicated radical expressions.
13. Rationalize denominators with square roots.
14. Write radicals in simplified form
15. Rationalize denominators with cube roots.
16. Simplify products or radical expressions.
17. Use conjugates to rationalize denominators of radical expressions.
18. Write radical expressions with quotients in lowest terms.
20. Identify equations with no solutions.
21. Solve equations by squaring a binomial.

Chapter 17: Quadratic equations.

1. Solve equations of the form $x^2 = k$ and $(ax + b)^2 = k$ where $k > 0$.
2. Use formulas involving squared variables.
3. Solve quadratic equations by completing the square
4. Solve applied problems that require the quadratic equation.
5. Use the quadratic formula to solve quadratic equations.