Chapter P: Prerequisites: Fundamental Concepts of Algebra 1 Summary


**Section 1: Be Able To**
- Find intersections and unions of sets
- Use inequality symbols
- Evaluate absolute value
- Simplify an algebraic expression
- Evaluate an algebraic expression
- Use order of operations
- **Apply the concepts**: Reference pages 18 – 19 problems 129 - 135

**Section 2: Be Able To**
- Simplify expressions using Product Rule for Exponents: \( a^m \cdot a^n = a^{m+n} \)
- Simplify expressions using Power-to-a-Power Rule for Exponent: \((a^m)^n = a^{mn}\)
- Simplify expressions using Product-to-a-Power Rule for Exponents: \((ab)^m = a^m b^m\)
- Simplify expressions using Quotient Rule for Exponents: \( \frac{a^m}{a^n} = a^{m-n} \)
- Simplify expressions using Negative rule for Exponents: \( a^{-n} = \frac{1}{a^n} \)
- Simplify expressions using Integer Exponents Rule: \( a^0 = 1 \)
- Simplify expression using Quotient-to-a-Power Rule for Exponents: \( \left( \frac{a}{b} \right)^m = \frac{a^m}{b^m} \)
- Convert from Scientific to Decimal Notation and vice versa (know calculator notation)
- **Apply the concepts**: Reference page 31 problems 115 - 122

**Section 3: Be Able To**
- Evaluate \( n \)th roots
- Use the Product Rule for Square Roots: \( \sqrt[n]{ab} = \sqrt[n]{a} \cdot \sqrt[n]{b} \)
- Use the Quotient Rule for Square Roots: \( \sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}} \)
- Add and subtracting radicals
- Rationalize denominators
- Evaluate and simplify rational exponents
- **Apply the concepts**: Reference page 47 problem 118

**Section 4: Be Able To**
- Add and subtract polynomials
- Multiply binomials:
sum and difference of the same two terms: \((a+b)(a-b)=a^2-b^2\)

squaring binomial: \((a+b)^2=a^2+2ab+b^2\)
\((a-b)^2=a^2-2ab+b^2\)

cubing binomial: \((a+b)^3=a^3+3a^2b+3ab^2+b^3\)
\((a-b)^3=a^3-3a^2b+3ab^2-b^3\)

- Multiply polynomials in two variables
- **Apply the concepts**: Reference pages 56 - 57 problems 91 - 94

**Section 5: Be Able To**
- Factor out the greatest common factor of a polynomial
- Factor by grouping
- Factor trinomials
- Factor the difference of two squares: \(a^2-b^2=(a+b)(a-b)\)
- Factor perfect square trinomials: \(a^2+2ab+b^2=(a+b)^2\)
\(a^2-2ab+b^2=(a-b)^2\)

- Factor the sum or difference of two cubes: \(a^3+b^3=(a+b)(a^2-ab+b^2)\)
\(a^3-b^3=(a-b)(a^2+ab+b^2)\)

- Factoring algebraic expressions containing fractional and negative exponents
- **Apply the concepts**: Reference page 69 problems 115, 116

**Section 6: Be Able To**
- Find domain of rational expressions
- Simplify rational expressions
- Multiply rational expressions
- Divide rational expressions
- Add and subtracting rational expressions with the same denominator
- Add and subtracting rational expressions with different denominator
- Complex rational expressions
- Fractional expressions in Calculus
- Rationalize numerators
- **Apply the concepts**: Reference pages 84 – 85 problems 91 - 93
Section 7: Be Able To
- Solve linear equations in one variable
- Solve linear equations containing fractions
- Solve rational equations
- Solve formulas for a specified variable
- Solve equations involving absolute value
- Solve quadratic equations (by zero product principle, factoring, square root property, completing the square and the quadratic formula)
- Solve radical equations
- Apply the concepts: Reference pages 104 – 105 problems 137 - 144

Section 8: Be Able To
- Use equations to solve problems
- Apply the concepts: Reference pages 116 - 119 problems 1 - 61

Section 9: Be Able To
- Find intersections and unions of intervals
- Solve linear inequalities
- Solve compound inequalities
- Solve absolute value inequalities
- Apply the concepts: Reference pages 132 – 133 problems 99 - 121