Math4010 Portfolio Assignment

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Objectives for the Portfolio: The student will

- See an overview of what was learned this semester.
- Have examples of use when teaching children.
- Reflect on the material covered in the class.

Portfolio Requirements:

- Utah State Core Curriculum for grades K-6 (10%)

- Problem Solving (10%)
  - Polya's Problem Solving Steps
  - List strategies for problem solving
  - Include 3 problems that you liked or found interesting.
  - Explain why you liked the problems.

- Number Systems (15%)
  - Sample Venn Diagrams, including $A \cup B$, $A \cap B$, $A - B$, and $\overline{A}$, and problems relating to them.
  - Venn Diagram of the Real number system showing natural numbers, whole numbers, integers, fractions, rationals, and irrationals.
  - Flow chart of the number systems with all algebraic properties associated with each number system.

- Number Concepts (15%)
  - Different historical number systems and their properties (lead up to our number system).
  - Explain historically why they were developed.
  - Illustrate the development of the number concepts across grade levels. (For example, what is a number?, how do kids think about or perceive numbers and how does that understanding progress through elementary school from whole numbers to fractions to integers, etc.?)

- Operations (20%)
  - Order of Operations (include examples)
  - Show several models for each arithmetic operation (addition, subtraction, multiplication and division) with
    - Whole Numbers (do some examples with bases other than base 10)
    - Fractions/Decimals
    - Integers
    - Real Numbers
  - In-depth Portfolio Problem

- Investigations (15%)
  - Factors
  - LCM (give many methods and examples)
  - GCF (give many methods and examples)
  - Divisibility Tests
  - Mental Math Strategies
  - Rules of Exponents (include examples)
  - Absolute Value (definition and examples)
  - Mathematical Questions: Choose two of the following questions and give thorough explanations of them.
    - Why can't we divide by zero?
    - How are we sure $\sqrt{2}$ is irrational?
    - How do we know there are infinitely many prime numbers?
    - Why can we invert and multiply?

- Reflections (15%)
  - From all assignments.
  - Final reflection: Describe your learning from this semester (in this class). What do you understand better now than when the semester began? What did you learn that seemed new to you? What did you learn that will benefit you as a teacher?
  - Practicum Report

- Additional Items
  - Book List (one of the worksheets in the packet)
  - Anything else you'd like to add here.