Number Theory and Computation Checklist

I am able to:

- ☐ distinguish among sets of numbers
  - ☐ natural numbers $\mathbb{N} = \{1, 2, 3, \ldots\}$
  - ☐ whole numbers $\mathbb{W} = \{0, 1, 2, 3, \ldots\}$
  - ☐ integers $\mathbb{Z} = \{\ldots -2, -1, 0, 1, 2, \ldots\}$
  - ☐ rational numbers $\mathbb{Q} = \{\frac{p}{q} : p \text{ and } q \text{ are integers, } q \neq o\}$
  - ☐ irrational numbers (numbers that cannot be expressed as terminating or recurring decimals, for example, numbers such as □ and √2)
  - ☐ real numbers $\mathbb{R}$ = {the union of rational and irrational numbers}
  - ☐ inclusion relations, for example, $\mathbb{N} \subset \mathbb{W} \subset \mathbb{Z} \subset \mathbb{Q} \subset \mathbb{R}$; and,
  - ☐ factors and multiples
  - ☐ square numbers
  - ☐ even numbers
  - ☐ odd numbers
  - ☐ prime numbers
  - ☐ composite numbers

- ☐ order a set of real numbers in ascending or descending order

- ☐ compute powers of real numbers of the form x^a, where $a \in \mathbb{Q}$
  - ☐ squares
  - ☐ square roots
  - ☐ cubes
  - ☐ cube roots

- ☐ evaluate numerical expressions using any of the four basic operations on whole numbers
  - ☐ addition,
  - ☐ multiplication
  - ☐ subtraction
  - ☐ division
  - ☐ order of operations

- ☐ list the set of factors and multiples of a given integer
  - ☐ positive factors of an integer
  - ☐ negative factors of an integer
  - ☐ compute the H.C.F. or L.C.M. of two or more integers

- ☐ evaluate numerical expressions using any of the four basic operations on fractions
  - ☐ addition,
  - ☐ multiplication
  - ☐ subtraction
  - ☐ division
  - ☐ order of operations

- ☐ calculate any fraction or percentage of a given quantity
  - ☐ fractions of a whole
  - ☐ percentages of a whole
  - ☐ the whole given a fraction or percentage

- ☐ express one quantity as a fraction or percentage of another
  - ☐ comparing two quantities using fractions
  - ☐ comparing two quantities using percentages

- ☐ evaluate numerical expressions using any of the four basic operations on decimals
  - ☐ addition,
  - ☐ multiplication
  - ☐ subtraction
  - ☐ division
  - ☐ order of operations

- ☐ express a value to a given number of:
  - ☐ significant figures (1, 2 or 3 significant figures)
  - ☐ decimal places (0, 1, 2 or 3 decimal places)

- ☐ write any rational number in scientific notation

- ☐ convert among fractions, per cents and decimals
  - ☐ conversion of fractions to decimals and percents
  - ☐ conversion of decimal to fractions and percents
  - ☐ conversion of percents to decimals and fractions

- ☐ divide a quantity in a given ratio
  - ☐ ratio of no more than three parts
  - ☐ proportion of no more than three parts

- ☐ compare quantities using
  - ☐ ratio
  - ☐ proportion
  - ☐ rates

- ☐ state the value of a digit of a numeral in a given base
  - ☐ place value of numbers in bases 2, 4, 8, and 10
  - ☐ face value of numbers in bases 2, 4, 8, and 10

- ☐ convert from one set of units to another
  - ☐ conversion using conversion scales,
  - ☐ converting within the metric scales,
  - ☐ converting within 12-hour and 24-hour clock

- ☐ use properties of numbers and operations in computational tasks
  - ☐ closure,
  - ☐ associativity,
  - ☐ additive identity
  - ☐ multiplicative identity
  - ☐ additive inverse
  - ☐ multiplicative inverse
  - ☐ commutativity
  - ☐ distributivity

- ☐ solve problems involving concepts in number theory and computation.

- ☐ complete a given sequence
  - ☐ compute terms of a sequence given a rule
  - ☐ derive an appropriate rule given the terms of a sequence