

**Course Objectives/Course Outline**  
**Spokane Community College**

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**Course Title:** Mathematics Center 1

**Prefix and Course Number:** MATH 20

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**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- Add, subtract, multiply and divide with whole numbers, fractions and decimals.
- Simplify exponential expressions and take the principal square root of positive real numbers.
- Simplify fractions to lowest terms.
- Convert between the word name for decimal numbers and decimal notation.
- Round whole and decimal numbers and perform estimations.
- Setup and solve application problems with whole numbers, fractions and decimals using addition, subtraction, multiplication and division.
- Simplify expressions using the order of operations with whole numbers, fractions and decimals.
- Setup and simplify ratios and rates.
- Setup and solve proportions, determine if a proportion is a true proportion.
- Convert between percent, fraction and decimal notation.
- Identify the amount, base and percent in an applied problem.
- Setup and solve percent problems using proportions or equations.
- Find a percent of increase or decrease.

**Course Outline:**

I. Review Operations with Whole Numbers

II. Fractions

- A. Write a fraction to represent a given part of a whole unit.
- B. Identify that part of a whole unit represented by a given fraction.
- C. Write a fraction to represent what part a given number of objects is of a total group of objects.
- D. Identify the number of objects in a group of objects as represented by a given fraction.
- E. Find the factors of a number.
- F. Find the Greatest Common Factor (GCF) of two or more numbers.
- G. Change fractions and mixed numbers to lowest terms.
- H. Write consecutive multiples of a number.
- I. Find the Least Common Multiple (LCM) for two or more fractions.
- J. Find the Least Common Denominator (LCD) for two or more fractions.
- K. Change fractions to higher terms.
- L. Write two or more fractions with a Least Common Denominator (LCD).
- M. Write whole numbers or mixed numbers as improper fractions.
- N. Write improper fractions as whole numbers or mixed numbers.
- O. Rename a whole number or mixed number as an equivalent mixed number.
- P. Add fractions with like denominators.
- Q. Add mixed numbers with like denominators (no regrouping).
- R. Add mixed numbers with like denominators (with regrouping).
- S. Add fractions with unlike denominators.
- T. Add mixed numbers with unlike denominators.
- U. Subtract fractions with like denominators.

- V. Subtract mixed numbers with like denominators (no regrouping).
- W. Subtract a fraction or mixed number from a whole number (with regrouping of whole numbers).
- X. Subtract mixed numbers with like denominators (with regrouping).
- Y. Subtract fractions with unlike denominators.
- Z. Subtract mixed numbers with unlike denominators.
- AA. Multiple unit fractions.
- BB. Multiply fractions where both numerators do not equal 1.
- CC. Multiply a whole number and a fraction.
- DD. Multiply a mixed number and a fraction.
- EE. Multiply a mixed number or a whole number by a mixed number.
- FF. Divide a whole number by a unit fraction.
- GG. Divide a whole number by a fraction.
- HH. Divide a fraction by a fraction.
- II. Divide a mixed number by a fraction.
- JJ. Divide a fraction or a mixed number by a whole number.
- KK. Divide a whole number or a fraction or a mixed number by a mixed number.

### III. Decimals

- A. Write decimals to ten-thousandths.
- B. Round decimals to the nearest tenth, hundredth, and thousandth.
- C. Write whole numbers, fractions, and mixed numbers as decimals.
- D. Write decimals as fractions and mixed numbers.
- E. Add decimals to ten-thousandths with no regrouping.
- F. Add decimals to ten-thousandths with regrouping.
- G. Subtract decimals to ten-thousandths with no regrouping.
- H. Subtract decimals to ten-thousandths with regrouping.
- I. Multiply a decimal by a whole number.
- J. Multiply a decimal by a decimal.
- K. Divide a decimal by a whole number.
- L. Divide a decimal by a decimal.

### IV. Ratio and Proportion

- A. Write ratios in simplest form, using "TO", a colon ( : ), or a fraction.
- B. Write rates in simplest form, using a fraction.
- C. Find unit rates.
- D. Determine if proportions are true.
- E. Solve true proportions.
- F. Write equal rates as a proportion, then solve.

### V. Percents

- A. Rewrite whole number percents up to 100% in fractional or decimal form.
- B. Rewrite whole number percents larger than 100% in fractional or decimal form.
- C. Rewrite percents less than 1% in fractional or decimal form.
- D. Rewrite mixed number and decimal percents in fractional or decimal form.
- E. Rewrite decimals as percents.
- F. Rewrite fractions as percents.
- G. Rewrite whole numbers and mixed numbers.
- H. Find a percentage of a given number.
- I. Find what percent one number is of another number.
- J. Find a number if a percentage of the number is known.

- VI. Introduction to Algebra
  - A. The integers.
  - B. Add and subtract signed number integers.
  - C. Multiply and divide number integers.
  - D. Evaluate algebraic expressions.
  - E. Solve equations.
  - F. Apply algebra.