



Course Objectives

- 1. Demonstrate the understanding of when to use addition, subtraction, multiplication and division.
- 2. Perform basic math operations with whole numbers.
- 3. Perform basic math operations with fractions.
- 4. Perform basic math operations with decimals.
- 5. Convert between fractions and decimals.
- 6. Define significant digits.
- 7. Round decimal numbers to the appropriate number of significant digits.

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Key Terms (Define the following)

sum
difference
difference
product
numerator
denominator
denominator
significant digits





Word Clues

And	addition
Sum	addition
Added/Combined	addition
Difference/Change/Excess	subtraction
Remaining	subtraction
Removed/Taken Away	subtraction
Decrease	subtraction
Total	addition or multiplication
Product	multiplication
Each	multiplication
Of	multiplication
In	multiplication or division
Per (/)	division
ls	equal



Rules for Fractions:

- 1. To add or subtract fractions, they must have the same bottom number (denominator).
- **2.** To add or subtract fractions, add or subtract the top numbers (numerators) only and put the result over the denominator.
- **3.** To add or subtract fractions with different denominators, first convert the fractions to the same denominator.
- **4.** When adding or subtracting mixed numbers (values with whole numbers and fractions), add or subtract the whole numbers together and then the fractions together OR convert to all fractions.
- **5.** Generally, fractional answers should be reduced to mixed fractions and the lowest denominator.
- **6.** To multiply fractions, multiply the numerators and the denominators.
- **7.** When multiplying fractions, values in the denominator can be canceled with 'like' values in the numerator.
- **8.** To divide fractions, invert the divisor (the 2nd fraction) and then multiply the numerators and denominators.

Rules for Decimals:

- 1. To calculate with fractions and decimals, convert to all fractions or all decimals.
- 2. To add or subtract numbers with decimals, line up the decimals and then add or subtract.
- **3.** To multiply or divide numbers with decimals, first multiply or divide the digits. Counting from the right, move over one decimal place for each decimal place in the original values.
- **4.** Decimals are rounded to the specified number of digits or to the number of digits in the original values. The desired number of decimal places is called significant digits.
- **5.** Multiplying a number with decimals by 10 moves the decimal 1 place.
- **6.** To divide by a decimal number, change the divisor to a whole number (no decimal) and then divide.

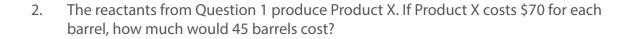
Significant Digit Rules:

- 1. Non-zero digits are significant (15 has two significant digits; 1.58 has three significant digits).
- 2. Zeroes placed between other digits are significant (4009 has four significant digits).
- **3.** Zeroes after other digits in a decimal number are significant (7.90 has three significant digits).
- **4.** Zeroes before other digits in a decimal number are not significant (0.046 has two significant digits).
- **5.** Zeroes at the end of a number that are behind a decimal point are significant (70.0 has 3 significant digits; 7.0×10^2 has 2 significant digits). Otherwise it is not possible to know if the zero is significant (70 has either 1 or 2 significant digits).

Questions

1.	Suppose a process requires a specific amount of three reactants. With the
	information given below, what is the total weight going into the process?

Reactant A = 55 lbs Reactant B = 40 lbs Reactant C = 105 lbs



A barrel holds 35 gallons. How much is Product X per gallon?

3. If a mixture is $\frac{1}{2}$ water, $\frac{1}{4}$ alcohol, and $\frac{1}{3}$ metal shavings, how much of the mixture is liquid?

4. How much dry product remains if $\frac{2}{5}$ of a 2 lb bag is used?

Convert to a mixed fraction.

Convert to a decimal.

5. If a solution is $\frac{2}{3}$ water, how much water is in 3 gal of solution?

How many ¾ gal containers would the 3 gal of solution fill?