

Moraine Park Technical College

804-360 Occupational Math 1

Course Outcome Summary

Course Information

Description	Presents the principles of arithmetic, calculator use, measuring systems, and introductory algebra with applications of these principles to various occupational areas. (Prerequisite: Test score required to register)
Total Credits	2.00

Textbooks

Richard N. Aufmann, Vernon C. Barker, Joanne S. Lockwood. *Basic College Mathematics; An Applied Approach*. **Edition:** 6th. Required.

Course Competencies

Perform arithmetic operations on whole numbers.

Learning Objectives

- Add whole numbers.
- Subtract whole numbers.
- Multiply whole numbers.
- Divide whole numbers.

Perform arithmetic operations on common fractions.

Learning Objectives

- Express a fraction in different but equal forms.
- Add common fractions.
- Subtract common fractions.
- Multiply common fractions.
- Divide common fractions.
- Add mixed numbers.
- Subtract mixed numbers.
- Multiply mixed numbers.
- Divide mixed numbers.

Perform arithmetic operations on decimal fractions.

Learning Objectives

- Add decimal fractions.
- Subtract decimal fractions.
- Multiply decimal fractions.
- Divide decimal fractions.
- Add combinations of decimals, mixed decimals and whole numbers.
- Subtract combinations of decimals, mixed decimals and whole numbers.
- Multiply combinations of decimals, mixed decimals and whole numbers.
- Divide combinations of decimals, mixed decimals and whole numbers.
- Convert between common fractions and decimal fractions.
- Convert between decimal numbers and their word form.

Solve percentage problems.

Learning Objectives

Convert between common fraction form and percent form of equivalent numbers.
Convert between decimal form and percent form of equivalent numbers.
Find the percent of a given number.
Find what percent one number is of another number.
Find a number when a percent of it is known.

Solve ratio and proportion problems.

Learning Objectives

Set up like quantities in a ratio.
Reduce a ratio to its lowest terms.
Express problem(s) in ratio form.
Set up like quantities as proportions.
Solve proportions for an unknown term.
Solve formulas that are in proportion form.

Read measurement instruments.

Learning Objectives

Read measurement instruments.

Convert measurements within the English system.

Learning Objectives

Convert measurements between English units.

Convert measurements within the metric system.

Learning Objectives

Convert measurements between metric units.

Convert measurements between the English and metric systems.

Learning Objectives

Convert measurements between English and metric units.

Determine powers and roots.

Learning Objectives

Raise numbers to indicated power(s).
Find the square and square root of a whole number or fraction.
Find the cube and cube root of a whole number or fraction.

Perform arithmetic operations on signed numbers.

Learning Objectives

Add signed numbers.
Subtract signed numbers.
Multiply signed numbers.
Divide signed numbers.
Determine coordinate locations on an x, y coordinate system.
Plot coordinates on an x, y coordinate system.

Evaluate expressions involving order of operations.

Learning Objectives

List the order of operations.
Sequence a numeric expression following the order of operations.
Evaluate a numeric expression following the order of operations.

Evaluate algebraic expressions.

Learning Objectives

List the order of operations.

Evaluate an algebraic expression following the order of operations.

Substitute numeric values for literals and solve the formula.

Select appropriate formula, substitute numeric values for literals, and solve for given situations.

Solve linear equations.

Learning Objectives

Solve equations using the addition principle of equality.

Solve equations using the subtraction principle of equality.

Solve equations using the division principle of equality.

Solve equations using the multiplication principle of equality.

Rearrange formulas.

Learning Objectives

Manipulate a given formula, isolating a specified unknown using the principles of equality.

CREDIT FOR PRIOR LEARNING BY EXAM STUDY GUIDE

To schedule an exam: contact Greg Mittelsteadt at 920-924-3215 or cpl@morainepark.edu

Occupational Math 1 (804-360)

Text: **Not required to be purchased for exam.**

Basic College Mathematics: An Applied Approach. 8th Edition by Richard N. Aufmann, Vernon C. Barker, and Joanne S. Lockwood

(There is a copy of the text on reserve in the Beaver Dam, Fond du Lac, and West Bend campus libraries.)

Course Content:

Chapter 1:	1.1 – 1.6
Chapter 2:	2.2 – 2.8
Chapter 3:	3.1 – 3.6
Chapter 4:	4.1 – 4.3
Chapter 5:	5.1 – 5.5
Chapter 8:	8.1 – 8.3
Chapter 9:	9.1 – 9.3, 9.5
Chapter 10:	10.1 – 10.4
Chapter 11:	11.1 – 11.4
Chapter 12:	12.1 – 12.4

Note: Not all chapters of the textbook and not all sections of each chapter are included.

The test is in two parts.

- Part 1 must be worked **without** a scientific calculator. A scientific calculator may be used on part 2.
- Each part of the test is worth 50 points. To satisfactorily pass the test you **must score 40 or more points on part 1 AND 80 or more points total.**
- Partial credit may be given for some problems when the final answer is incorrect, so it is to your advantage to show as much work as possible.
- The attached information/formula sheets will be provided with the test but no books or notes or allowed.

Without a calculator you must:

1. Add, subtract, multiply and divide whole numbers.
2. Add, subtract, multiply and divide fractions.
3. Add, subtract, multiply and divide decimals.
4. Add, subtract, multiply and divide signed numbers.
5. Convert fraction, decimal, and percent equivalents.
6. Evaluate powers and square roots.
7. Evaluate expressions, using the Standard Order of Operations.
8. Solve basic one-and two-step equations.

With a scientific calculator you must:

1. Solve one-and two-step equations, including proportion type equations.
2. Convert measurements within the English system, within the metric system, and between the two systems, using a conversion table.
3. Solve word problems utilizing the following:
 - a. Whole numbers
 - b. Fractions
 - c. Decimals
 - d. Percents
 - e. English and metric systems of measurements
4. Solve geometry problems involving perimeter, area, and volume.
5. Find missing angle values for various geometric situations.

Length

- 12 inches (in.) = 1 foot (ft)
- 3 ft = 1 yard (yd)
- 36 in. = 1 yard (yd)
- 5280 ft = 1 mile (mi)

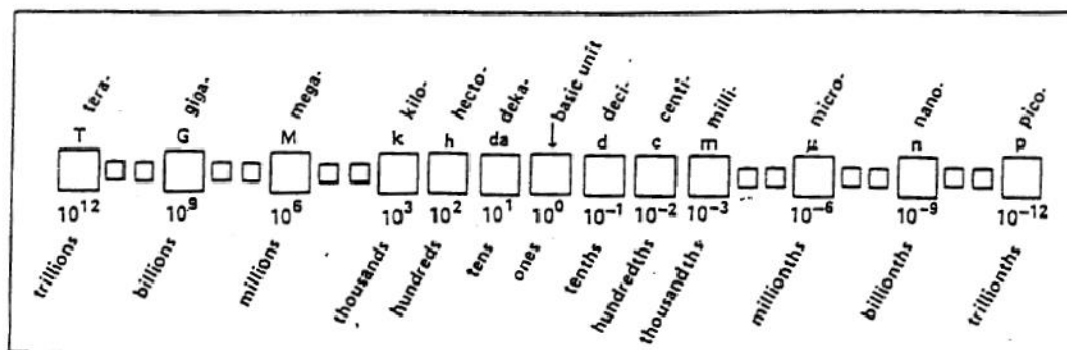
Weight

- 16 ounces (oz) = 1 pound (lb)
- 2000 lb = 1 ton

Capacity

- 8 fluid ounces (fl oz) = 1 cup (c)
- 2 c = 1 pint (pt)
- 2 pt = 1 quart (qt)
- 4 qt = 1 gallon (gal)

METRIC SYSTEM DIAGRAM

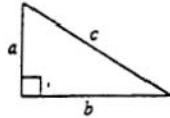


Conversion Between the U.S. Customary and the Metric Systems of Measurement

<i>Units of Length</i>	<i>Units of Weight</i>	<i>Units of Capacity</i>
1 in. = 2.54 cm	1 oz = 28.35 g	1 L = 1.06 qt
1 m = 3.28 ft	1 lb = 454 g	1 gal = 3.79 L
1 m = 1.09 yd	1 kg = 2.2 lb	
1 mi = 1.61 km		

Table of Geometric Formulas

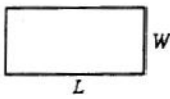
Pythagorean Theorem



$$\text{Hypotenuse} = \sqrt{(\text{leg})^2 + (\text{leg})^2}$$

$$\text{Leg} = \sqrt{(\text{hypotenuse})^2 - (\text{leg})^2}$$

Perimeter and Area of a Rectangle



$$P = 2L + 2W$$

$$A = LW$$

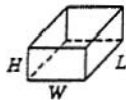
Circumference and Area of a Circle



$$C = 2\pi r \text{ or } C = \pi d$$

$$A = \pi r^2$$

Volume of a Rectangular Solid



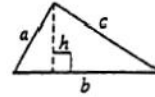
$$V = LWH$$

Volume of a Sphere



$$V = \frac{4}{3}\pi r^3$$

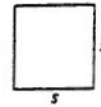
Perimeter and Area of a Triangle



$$P = a + b + c$$

$$A = \frac{1}{2}bh$$

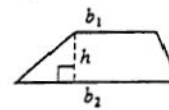
Perimeter and Area of a Square



$$P = 4s$$

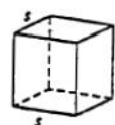
$$A = s^2$$

Area of a Trapezoid



$$A = \frac{1}{2}h(b_1 + b_2)$$

Volume of a Cube



$$V = s^3$$

Volume of a Right Circular Cylinder



$$V = \pi r^2 h$$