

Vanguard University
School for Professional Studies
Degree Program

“ESSENTIAL MATHEMATICS”
MATH 105

Student Guide

04/08
DS 01/10

COURSE DESCRIPTION

This math course is designed to introduce students to practical mathematical skills necessary for courses in business, statistics, and data analysis. Emphasis will be placed on the structural and logical foundations of mathematics. The course prepares students to understand the essential mathematical concepts in number sense, elementary algebra, sets of numbers, problem solving, ratios, proportions, percents, and graphing linear equations and inequalities. This course does **not** meet a general education math requirement. The course fulfills a prerequisite option for MATH 145C Data Analysis or MATH 106 Business Math.

CATALOG DESCRIPTION

This course prepares students to understand the essential mathematical concepts in number sense, elementary algebra, sets of numbers, problem solving, ratios, proportions, percents, and graphing linear equations and inequalities. The course is designed to introduce students to practical mathematical skills necessary for courses in business and statistics. Emphasis will be placed on the structural and logical foundations of business. (*This course is not applicable to the general education Math requirement.*)

TEXTS AND MATERIALS

Required text and calculator:

*Smith, K.J. (2009). *Mathematics: Its Power and Utility* (9th Edition). Pacific Grove: Thomson Brooks/Cole (ISBN-13: 978-0-495-38913-2 or ISBN-10: 0-495-38913-7)

***Calculator** with basic mathematical functions (addition, subtraction, multiplication, division)

COURSE POLICIES

Disability Services:

For students with documented medical or psychological disabilities, please contact the Coordinator of Disability Services to request reasonable accommodations. The Coordinator of Disability Services is located in the Counseling Center on the second floor of the Scott Academic Center and can be reached at extension 4489 or by email at disabilityservices@vanguard.edu

For students with a documented learning disability who would like to request appropriate accommodations, please contact the Director of Learning Skills, located upstairs in Scott Academic Center at extension 2540 or by email at disabilityservices@vanguard.edu

LEARNING OUTCOMES

At the conclusion of this class, students will:

- 1) use and develop critical thinking skills through finding solutions to real-world situations,
- 2) participate in a variety of mathematical topics and problem solving skills that relate to aspects of everyday life,
- 3) become more enlightened consumers and investors in working with several financial formulas that are used for borrowing and investing money,
- 4) develop a stronger foundation in number sense and elementary algebra concepts,
- 5) comprehend and manipulate problems in ratio, proportion, and linear graphing exercises,
- 6) understand how, historically, the prime value of mathematics has enabled us to answer the basic questions about our physical world,
- 7) comprehend the complicated operations of nature and dissipate much of the physical mystery that envelops life,
- 8) experience how different variables can be brought together to make optimal solutions.

Objectives for this course are related to the overall Educational Targets and Goals of Vanguard University of Southern California, which include:

Intellectual Engagement

Students will . . .

- learn to think critically and evaluate evidence rationally,
- acquire and continue to use skills for learning,
- utilize research methods for the expansion of knowledge and problem solving, and
- develop the ability to communicate the fruits of learning and research effectively.

Spiritual Formation

Students will . . .

- understand Christian existence as a journey that integrates human experience with personal faith,
- gain an appreciation for the value of participation in communities of believers, and
- develop and maintain a biblically based and theologically sound Christian lifestyle of personal and social responsibility.

Professional Excellence

Students will . . .

- understand current theories and practices in their respective academic disciplines in the context of the liberal arts and sciences,
- develop lifelong skills for communicating and performing professionally,
- achieve technological competence in acquiring and processing information,
- acquire interpersonal ability to work harmoniously with others, and
- internalize a strong sense of professional ethics.

Aesthetic Expression

Students will . . .

- understand various sources of aesthetic sensitivity and expression as inherent human endowments and part of God's creation;
- gain an awareness, understanding, appreciation, and expression of the fine and performing arts; and
- develop interpretive frameworks of aesthetic truths and values for personal wholeness and community enrichment.

Responsible Stewardship

Students will . . .

- adopt a lifestyle of personal health and well-being,
- appreciate the value of family and other meaningful relationships,
- exhibit the responsibilities of citizenship in society,
- gain a global outlook in caring for the environment and in promoting social justice and economic empowerment, and
- promote the church's mission through community service.

Sociocultural Responsiveness

Students will . . .

- demonstrate a capacity to challenge personal prejudices, appreciate cultural diversity, and learn from other cultures;
- develop a commitment to pursue peace, justice, and reconciliation in a pluralistic society; and
- celebrate the differences of race, ethnicity, gender, and age within the biblical vision of inclusiveness and the equal value of all people.

STUDENT EVALUATION

Students in this course will be evaluated by the University's 4.0 grading system. You should refer to the University's Student Handbook for further details on the grading system.

The following criteria will be used in determining the student's grade:

Assignment/Grading	Points	Date Due
Assignments/Homework	250 (25%)	Weeks 1-7
Attendance/Participation	100 (10%)	Weeks 1-7
Quizzes	100 (10%)	Weeks 3, 5, 6
Mid-term Exam	250 (25%)	Week 4
Final Exam	300 (30%)	Week 7

TOTAL POINTS: 1000 points (100%)

Percentages	Points	Grade	Significance	GPA
93-100%	930-1000	A	Exceptional	4.00
90-92.9%	900-929	A-		3.67
87-89.9%	870-899	B+	Good	3.33
83-86.9%	830-869	B		3.00
80-82.9%	800-829	B-		2.67
77-79.9%	770-799	C+	Satisfactory	2.33
73-76.9%	730-769	C		2.00
70-72.9%	700-729	C-		1.67
67-69.9%	670-699	D+	Poor	1.33
63-66.9%	630-669	D		1.00
60-62.9%	600-629	D-		0.67
00-59.9%	000-599	F	Failure	0.00

OVERVIEW

Assignments are listed in the weekly outline. Students are expected to read the listed definitions, terms, laws, formulas, theorems and/or properties in each of the required sections **before** coming to class. The text contains several "In Your Own Words" questions and problems. Students should attempt to understand and answer these. If students have questions of any of these items, time will be given in class for discussion. Class time will provide opportunities to discuss in detail any questions that may arise from the reading or assignments. Completed assignments are due on the week they are assigned. Each assignment will be graded and returned to the student.

DESCRIPTION OF ASSIGNMENTS AND POLICIES

Assignments/Homework: Students must read through each specified assignment and complete the assigned problems prior to the start of each class. Students will be graded both on accuracy and completion of each assignment.

Attendance And Tardy Policy: You must attend class on time and remain present until dismissed. Class attendance is necessary in order to complete the course. The School for Professional Studies relies on the dynamics of class interaction and group processing in order to integrate and apply the learning of academic content. This model also emphasizes the development and practice of interpersonal communication skills and teamwork (e.g., group problem solving and negotiation). The format therefore necessitates class attendance. In practical terms, one course session is equivalent to three weeks of traditional semester course work.

Students who miss more than one class meeting (or more than five class hours) in any given course will automatically receive a failing grade and need to retake the course to obtain a passing grade.

Students who arrive late disturb the class. At the professor's discretion, students who arrive late may not receive participation points for the unit covered. Students who are habitually late may be asked to drop the course.

Class Participation: You must be prepared and participate in all discussions. Criterion: Is the student engaged in classroom discussions? Does the student demonstrate an ability to handle assigned material with a degree of proficiency? (E.g., demonstrate the type of questions and issues consistent, and reflecting a familiarity with the assigned material). Students who are absent will receive no points for that week; students who arrive late or leave early will have points deducted accordingly. Attendance and Participation will constitute *ten* percent of the student's overall course grade.

Quizzes: Definitions of mathematical terms and concepts, in addition to arithmetic calculations, are critical in the development and understanding of the subject matter. Quizzes will be given during Weeks 3, 5, and 6.

Mid-term Exam: A mid-term exam will be given during the fourth class session. The midterm exam will cover chapters 1-3.

Final Exam: Students will take a final exam during their final class session. The final exam will cover the assigned sections of chapters 4, 5, 7, 10, and 11.

Submission of Final Exams / Papers: The School for Professional Studies office does not assume responsibility for any final papers. No homework or final papers will be accepted for professors in the SPS office, nor will final papers be returned to students through the SPS office.

The method for the submission of homework and the final exam or final paper will be determined by the professor. The professor will discuss the method which will be employed during the first night of class. All exchanges of papers will be between the student and the professor.

Late Work, Grading and Late Point Policy: Student grades are determined using the formula contained in this guide. The policy set by the School of Professional Studies is that no late work will be accepted. If, due to extreme circumstances, a professor accepts a late assignment, that assignment will be subject to point deduction to be determined by the professor. If a student anticipates an absence, arrangements must be made to send the assignment(s) to the professor on the day of class (e.g., via e-mail with attachment; sent with another student). Extreme or unusual circumstances will be handled on a case-by-case basis.

Academic Dishonesty: Work submitted for assessment purposes must be the independent work of the student concerned. Plagiarism, or copying and use of another's work without proper acknowledgment, is not permitted. Nor is it permissible for any former or present student to allow another student to refer to, use as a sample, or in any way copy or review their work. If a student needs guidance, he or she must seek the Professor's assistance.

MATH ANXIETY BILL OF RIGHTS

1. I have the right to learn at my own pace and not feel put down or stupid if I'm slower than someone else.
2. I have the right to ask whatever questions I have.
3. I have the right to need extra help.
4. I have the right to ask a teacher or TA for help.
5. I have the right to say I don't understand.
6. I have the right not to understand.
7. I have the right to feel good about myself regardless of my abilities in math.
8. I have the right not to base my self-worth on my math skills.
9. I have the right to view myself as capable of learning math.
10. I have the right to evaluate my math instructors and how they teach.
11. I have the right to relax.
12. I have the right to be treated as a competent adult.
13. I have the right to dislike math.
14. I have the right to define success in my own terms.

From *Mathematics: Its Power and Utility* by K.J. Smith, p. 5

HINTS FOR MATH SUCCESS

1. *Mathematics is different from other subjects.* One topic builds on another, and you need to make sure that you understand each topic before progressing to the next one.
2. *You must make a commitment to attend each class.* Obviously, unforeseen circumstances can come up, but you must plan to attend class regularly. Pay attention to what your teacher says and does, and take notes. If you must miss class, write an outline of the text corresponding to the missed material, including working out each text example on your notebook paper.
3. *You must make a commitment to daily work.* Do not expect to save up and do your mathematics work once or twice a week. It will take a daily commitment on your part, and you will find mathematics difficult if you try to "get it done" in spurts. You could not expect to become proficient in tennis, soccer, or playing the piano by practicing once a week, and the same is true of mathematics. Try to schedule a regular time to study mathematics each day.
4. *You must read the text carefully.* Many students expect to get through a mathematics course by beginning with the homework problems, then reading some examples, and reading the text only as a desperate attempt to find an answer. This procedure is backward; do your homework only *after* reading the text.
5. *You must ask questions.* Learning mathematics may involve frustration. Do not put off asking questions when you don't understand something, or if you feel an anxiety attack coming. Stop and put this book aside for a while. Talk to your instructor or a fellow student.

From *Mathematics: Its Power and Utility* by K.J. Smith, pp. 5-6

WEEK ONE: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for **THIS** class session (Week 1).

Assignment: Due Class Session #1. Attempt each of the Self-Test questions on pages 74-75 (#1-30) *prior* to coming to the first class session (Week 1). DO NOT work the problems from each of the individual sections identified below – **work only the Self-Test problems assigned on pages 74 and 75 (#1-30)** for the first class session. These problems will be reviewed and discussed during the first class session.

Description and Content**1.1 – 1.7 Chapter One: Arithmetic, Calculators, and Problem Solving**

1.1 Math Anxiety

Mathematics Bill of Rights; Writing Mathematics

1.2 Formulating the Problem

Order of Operations; Mixed Operations; Translation and Classifying; Comparing Order; Estimation

1.3 Fractions and Decimals

Division Notation; Division by Zero; Classifying Fractions; Writing an Improper Fraction as a Mixed Number; Writing a Mixed Number as an Improper Fraction; Changing Common and Mixed Fractions to Decimal Fractions

1.4 Rounding and Estimations

1.5 Exponents and Prime Factorization

Scientific Notation; Finding Factors; Prime factorization of a number

1.6 Common Fractions

Fundamental Property of Fractions; Procedure for Reducing Fractions; Multiplying Fractions; Finding Sale Price; Finding Reciprocals; Dividing Fractions; Changing terminating decimals to fractions

1.7 Adding and Subtracting Fractions

Fractions with Common Denominators; Finding Lowest Common Denominator; Extended Order of Operations; Fractions Without Common Denominators; Mixed Operations with Fractions; Using Juxtaposition for Multiplication

WEEK TWO: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for **THIS** class session (Week 2).

Description and Content**Chapter One: Arithmetic and Problem Solving**

Lesson 1.1 Math Anxiety, pages 4-10 (*review only*)

Historical Perspective; Math Anxiety Bill of Rights; Directing Focus; Hints for Success; Writing Mathematics; Journal Ideas.

➔ *Review and Discussion only (no homework assigned)*

Lesson 1.2 Formulating the Problem, pages 11-19

Order of Operations; Mixed Operations; Translation and Classifying; Comparing Order; Estimation.

Assignment: *pages 18-19 #2-28 (even)*

Lesson 1.3 Fractions and Decimals, pages 20-29

Division Notation; Division by Zero; Classifying Fractions; Writing an Improper Fraction as a Mixed Number; Writing a Mixed Number as an Improper Fraction; Changing Common and Mixed Fractions to Decimal Fractions

Assignment: *pages 27-28 #3-39 (multiples of 3) [i.e., 3, 6, 9, 12, 15, etc.]*

Lesson 1.5 Exponents and Prime Factorization, pages 34-42

Scientific Notation; Finding Factors; Prime factorization of a number

Assignment: *pages 40-41 #5, 9-12, 17-18, 21-22, 25-26, and 31-32 (ALL)*

Lesson 1.6 Common Fractions, pages 43-51

Fundamental Property of Fractions; Procedure for Reducing Fractions; Multiplying Fractions; Finding Sale Price; Finding Reciprocals; Dividing Fractions; Changing terminating decimals to fractions

Assignment: *pages 50-51 #7-10, 24-27, 32-33, and 36-37 (ALL)*

Lesson 1.7 Adding and Subtracting Fractions, pages 52-61

Fractions with Common Denominators; Finding Lowest Common Denominator; Extended Order of Operations; Fractions Without Common Denominators; Mixed Operations with Fractions; Using Juxtaposition for Multiplication

Assignment: *pages 59-60 #3-21 (multiples of 3) [i.e., 3, 6, 9, 12, etc.]*

WEEK THREE: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for **THIS** class session (Week 3).

Description and Content**Chapter Two: Sets of Numbers**

***Vocabulary Quiz #1** - Week 3: Arithmetic (see attached vocabulary terms)

Lesson 2.1 Symbol Shock, pages 84-90

Using variables; Variable expression; Domain; Translating an English expression into a variable expression; Symbol descriptions; Evaluating expressions; Number puzzle.

Assignment: pages 89-90 #3-54 (multiples of 3) [i.e., 3, 6, 9, 12, etc.]

Lesson 2.2 Addition of Integers, pages 91-98

Signed numbers; Opposites; Integers; Number line; Order symbols; Comparing the sizes of numbers; Absolute value; Evaluating an absolute value; Procedure for adding integers; Adding integers.

Assignment: pages 96-97 #3-33 (multiples of 3) [i.e., 3, 6, 9, 12, etc.]

Lesson 2.3 Subtraction of Integers, pages 98-103

Procedure for subtracting integers; Subtraction by adding the opposite; Minus, Negative and opposite symbols; Correct use of the $-x$ symbol; Evaluation of expression with negative numbers.

Assignment: pages 101-103 #5-55 (multiples of 5) [i.e., 5, 10, 15, 20, 25, etc.]

Lesson 2.4 Multiplication of Integers, pages 103-108

Product of positive and negative numbers; Procedure for multiplying integers; Evaluating algebraic expressions with integers; Evaluating algebraic expressions dealing with opposites.

Assignment: pages 107-108 #5-60 (multiples of 5) [i.e., 5, 10, 15, 20, 25, etc.]

Lesson 2.5 Division of Integers, pages 108-112

Procedure for dividing integers; Evaluating expressions with a fractional grouping bar; Average test score; Finding an average.

Assignment: pages 111-112 #3-60 (multiples of 3) [i.e., 3, 6, 9, 12, etc.]

“Arithmetic” Vocabulary Terms and Concepts

1. **Natural numbers** – the counting numbers (1, 2, 3)
2. **Whole numbers** – the counting numbers beginning with and including zero (0, 1, 2, 3 ...)
3. **Integers** – positive and negative whole numbers and zero (. . . -3, -2, -1, 0, 1, 2, 3, 4 . . .)
4. **Odd numbers** – numbers not evenly divisible by 2 (1, 3, 5, 7)
5. **Even numbers** – numbers evenly divisible by 2 (0, 2, 4, 6)
6. **Prime number** – a number that can be evenly divided by *only* 1 and itself (2, 3, 5, 7, 11, 13 . . .). NOTE: 0 and 1 are neither prime nor composite
7. **Composite number** – number divisible by *more* than just 1 and itself (4, 6, 8, 9, 10, 12, 14, 15 . . .). NOTE: 0 and 1 are neither prime nor composite
8. **Squares** – the results when numbers are multiplied by *themselves* ($3 \times 3 = 9$)
9. **Cubes** – the results when numbers are multiplied by themselves *twice* ($3 \times 3 \times 3 = 27$)
10. **1 square foot** – equals 144 square inches
11. **1 square yard** – equals 9 square feet
12. **1 yard** – equals 36 inches
13. **1 mile** – equals 5,280 feet
14. **1 ton** – equals 2,000 pounds
15. **1 pint** – equals 2 cups
16. **1 quart** – equals 2 pints
17. **1 gallon** – equals 4 quarts
18. **1 bushel** – equals 4 pecks
19. **1 decade** – equals 10 years
20. **1 century** – equals 100 years
21. **1 kilometer (km)** – equals 1,000 meters (m)
NOTE: one kilometer equals *about* 0.6 mile
22. **1 meter (m)** – equals 10 decimeters (dm) or 100 centimeters (cm) or 1000 millimeters
NOTE: one meter equals *a little more than* a yard
23. **1 liter (l)** – equals 1,000 milliliters (ml)

NOTE: one liter equals *slightly more than* a quart

24. **1 gram (g)** – equals 1,000 milligrams (mg)
25. **1 kilogram** – equals 1,000 grams. NOTE: one kilogram equals *about* 2.2 pounds
26. **numerator** – the part of the fraction that is *above* the line
27. **denominator** – the part of the fraction that is *below* the line
28. **common fraction** – a fraction where the numerator is smaller than the denominator and equals less than one.
29. **improper fraction** – a fraction where the numerator is larger than the denominator and equals more than one.
30. **mixed number** – the name for a term that contains both a whole number and a fraction
31. **lowest terms** – when a fraction is reduced by dividing both the numerator and the denominator by the largest number that will divide evenly into both
32. **lowest common denominator (LCD)** – the smallest number that can be divided evenly by all the denominators in the problem
33. **percentage change** – you find this by dividing the amount of change by the starting point, and then multiple that answer by 100
34. **mean** – you find this average by adding up all the numbers of a given set and then dividing that sum by the total number of numbers
35. **mode** – the most frequently occurring number, score, or measure in a given set
36. **median** – you find this number by arranging the scores or numbers in order by size, and then finding the middle score or number
37. **range** – you get this number by subtracting the smallest term from the largest term in a group of scores or numbers

WEEK FOUR: ----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for **THIS** class session (Week 4).

Description and Content – Chapter Three: The Nature of Algebra

Lesson 3.1 Polynomials, pages 134-140

Number Coefficient; Multiplication with Variables; Using the Addition Law of Exponents; Simplifying Variable Expressions; Classifying Polynomials by Terms and Degrees; Degree of a Term.

Assignment: page 138-139 #5-55 (multiples of 5) [i.e., 5, 10, 15, 20, 25, etc.]

Lesson 3.2 Similar Terms, pages 140-143

Distributive Property; Recognizing Similar Terms.

Assignment: pages 142-143 #5-45 (multiples of 5) [i.e., 5, 10, 15, 20, 25, etc.]

Lesson 3.3 Simplification (Polynomials), pages 143-148

Using Distributive Property; Adding Polynomials; Subtracting Polynomials; Simplifying Polynomials (multiplication and addition); Simplifying Polynomials (multiplication and subtraction); Multiplying Binomials.

Assignment: pages 147-148 #5-60 (multiples of 5)

Lesson 3.4 Equations, pages 148-1585(review only)

Addition Properties of Equations; Subtraction Property of Equations; Multiplying Reciprocals; Multiplication Property of Equations; Division Property of Equations.

➔ *Review and Discussion only (no homework assigned)*

Lesson 3.5 Solving Equations, pages 155-160

Basic Properties of Solving Equations; Procedure for Solving Equations.

Assignment: pages 158-160 #5-40 (multiples of 5)

Lesson 3.6 Problem Solving with Algebra, pages 161-169

Solving a Literal Equation; Number Problems; Procedures for Problem Solving; Consecutive Integer Problems; Mileage Problems (MPG); Price Comparison Problems

Assignment: page 167-168 #12-36 (multiples of 3) **and** 37-41 (ALL)

Mid-Term Exam (Chapters 1-3)

A mid-term exam will be given during the fourth class session. The midterm exam will cover material from chapters 1-3.

WEEK FIVE: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for **THIS** class session (Week 5).

Description and Content**Chapter Four: Percents and Problem Solving**

***Vocabulary Quiz #2** - Week 5: Algebra (see attached vocabulary terms)

Lesson 4.1 Ratio and Proportion, pages 184-188

Writing a ratio in lowest terms; Notation of proportions; Finding ratios that form a proportion.

Assignment: pages 187-188 #5-45 (multiples of 5) [i.e., 5, 10, 15, 20, 25, etc.]

Lesson 4.2 Problem Solving with Proportions, pages 188-193

Finding a missing term of a proportion; Procedure for solving proportions; Problem solving using proportions.

Assignment: pages 192-193 #3-51 (multiples of 3) [i.e., 3, 6, 9, 12, 15, etc.]

Lesson 4.3 Percent, pages, 193-199

Meaning of percent; Writing percents as fractions; Writing percents as decimals; Changing fractions to percents; Changing from decimal forms to percents and fractions.

Assignment: pages 197-198 #5-50 (multiples of 5)

Lesson 4.4 Problem Solving with Percents, pages 199-206

Estimating percentages; Estimating percents using multiples; Identifying the parts of a percent problem; Problem solving with percents.

Assignment: pages 205-206 #5-50 (multiples of 5)

“Algebra” Vocabulary Terms and Concepts

1. **Commutative Property for Addition** – the *order* of terms does not make any difference when adding simple terms ($a + b = b + a$)
2. **Associative Property for Addition** – the grouping of terms does not make any difference when adding simple terms [$(a + b) + c = a + (b + c)$]
3. **Identity Property for Addition** – any number added to 0 gives the original number ($a + 0 = a$)
4. **Additive Inverse**– the opposite (or negative) of a number ($a, -a$; or $5, -5$)
5. **Additive Inverse Property** – any number plus its opposite (negative) equals 0 ($a + -a = 0$)
6. **Commutative Property for Multiplication** – the *order* of terms does not make any difference when multiplying simple terms ($a \times b = b \times a$)
7. **Associative Property for Multiplication** – the grouping of terms does not make any difference when multiplying simple terms [$(a \times b) \times c = a \times (b \times c)$]
8. **Identity Property for Multiplication** – any number multiplied by 1 gives the original number ($a \times 1 = a$)
9. **Multiplicative Inverse** – the reciprocal of a number ($a, 1/a$; or $2, 1/2$)
10. **Multiplicative Inverse Property** – any number multiplied by its reciprocal equals 1 ($a \times 1/a = 1$; or $2 \times 1/2 = 1$)
11. **Distributive Property** – the process of multiplying the number on the outside of a parentheses to each term on the inside, and then adding those terms together
 $a(b + c) = a(b) + a(c)$
12. **equation** – a relationship between numbers and/or symbols in which both sides of the relationship are equal to each other
13. **literal equations** – a relationship that only contains symbols (letters), but not numbers
($ST + R = Z$)
14. **equivalent equations** – two or more relationships that have the same solution for the same replacement set
15. **open sentence** – an equation that contains at least one variable
16. **solution set** – the set of numbers in an open sentence that makes the sentences true

17. **numerical expression** – does not contain a variable and contains at least one of the operations of addition, subtraction, multiplication, or division
18. **proportions** – written as two fractions (or ratios) equal to each other
19. **variable** – a letter representing one or more numbers
20. **scientific notation** – when a number is represented as the product of some power of 10 and a number from 1 to 10
21. **term** – a real number, a variable, or the *product* of real numbers and variables
22. **monomial** – an algebraic expression that consist of only *one* term (5 ; $3x$; $2xyz^4$)
23. **binominal** – an algebraic expression that consist of *two* terms separated by an addition or subtraction operation ($5x + 7y$)
24. **trinomial** – an algebraic expression that consist of *three* terms separated by addition or subtraction operations ($5x + 7y - 2$)
25. **polynomial** – a monomial or the sum of monomials (include monomials, binomials, trinomials, etc.)
26. **factor** – means to find two or more quantities whose product equals the original quantity (factors of the number 6 are 3 and 2, or 6 and 1)
27. **function** – a relation for which no two ordered pairs have the same first element
28. **quadratic equation** – an equation that can be written in the form $ax^2 + bx + c = 0$ (where a , b , and c are real numbers and a does not equal 0)
29. **exponent** – indicates how many times a number is used as a factor (in 2^3 , the 3 indicates that the 2 is used 3 times as a factor: $2 \times 2 \times 2 = 8$)
30. **incomplete quadratic** – a quadratic with a missing term
31. **inequality** – a mathematical statement in which the relationships are not equal (such as $<$, \neq or $>$)
32. **system of equations** – two or more equations with the same two variables
33. **consistent system** – a system of equations that has a solution set

WEEK SIX: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for **THIS** class session (Week 6).

Description and Content**Chapter Five: Introduction to Geometry****Chapter Seven: Introduction to Business Math (Applications of Percent)**

***Vocabulary Quiz #3** - Week 6: Geometry (see attached vocabulary terms)

Lesson 5.3 Triangles, pages 234-240

Six parts of a triangle; Finding corresponding parts of a given triangle; Sum of the measures of the angles in a triangle; Finding a missing angle of a triangle; Using algebra to find the angles of a triangle; Finding an exterior angle.

Assignment: pages 238-240 #3-6 (ALL), 11-22 (ALL), 29-34 (ALL), **and** 43-50 (ALL)

Lesson 5.4 Similar Triangles, 241-250

Corresponding parts of similar triangles; Finding lengths of sides of similar triangles; Problem solving with similar triangles; Sides of a right triangle; Problem solving using the Pythagorean theorem; Finding sides of a triangle using trigonometric ratios; Finding trigonometric ratios; Problem solving with trigonometric ratios.

Assignment: pages 247-249 #3-15 (multiples of 3) **and** 24-42 (multiples of 3)

Lesson 7.1 Discount, Sale Price, and Sales Tax, 334-340

Discount; Percent markdown; Amount of discount with a percent markdown; Amount of discount with a fractional markdown; Sale Price; Finding complements; Finding sale price using complement; Finding original price; Finding the percent markdown; Finding sales tax; Finding price including sales tax.

Assignment: pages 338-340 #5-55 (multiples of 5) [i.e., 5, 10, 15, 20, 25, etc.]

Lesson 7.2 Simple Interest, 341-348

Simple interest formula; Amount of simple interest; Finding interest paid on a savings deposit; Problem solving with the simple interest formula; Future value; Amount of interest with known monthly payments; Interest for part of year; Problem solving with part of year; Determining necessary retirement sum; Simple interest formula for part of year; Finding future value of savings accounts.

Assignment: pages 346-348 #5-60 (multiples of 5) [i.e., 5, 10, 15, 20, 25, etc.]

“Geometry” Vocabulary Terms and Concepts

1. **plane geometry** – the study of shapes and figures in two dimensions (the plane)
2. **solid geometry** – the study of shapes and figures in three dimensions
3. **point** – the most fundamental idea in geometry; it is represented by a dot and named by a capital letter.
4. **line** – consists of an infinite number of points and continues in both directions forever.
5. **line segment** – any two distinct points on a line and all the points between them; it is named by its two endpoints.
6. **ray** – has only one endpoint and continues forever in one direction
7. **angle** – is formed by two rays that start from the same point
8. **vertex** – the endpoint where the two rays of an angle start
9. **adjacent angles** – two angles that share a common side and a common vertex
10. **right angle** – an angle that has a measure of 90°
11. **acute angle** – an angle whose measure is less than 90°
12. **obtuse angle** – an angle whose measure is larger than 90° but smaller than 180°
13. **straight angle** – an angle whose measure is 180°
14. **complementary angles** – two angles whose sum is 90°
15. **supplementary angles** – two angles whose sum is 180°
16. **angle bisector** – a ray from the vertex of an angle that divides the angle into two equal pieces
17. **vertical angles** – the angles opposite each other when two straight lines intersect; these opposite angles are always equal to each other.
18. **intersecting lines** – two or more lines that cross each other at the same point
19. **perpendicular lines** – two lines that meet to form right angles with each other
20. **parallel lines** – two or more lines that remain the same distance apart at all times
21. **polygons** – closed shapes or figures with three or more sides
22. **triangle** – a three-sided polygon

23. **equilateral triangle** – a triangle having all *three* sides and all *three* angles equal
24. **isosceles triangle** – a triangle having *two* sides equal in length
25. **scalene triangle** – a triangle having *none* of its sides equal in length
26. **right triangle** – a triangle having a right angle in its interior
27. **hypotenuse** – the side opposite the right angle and largest side of a triangle
28. **Pythagorean theorem** – states that in any right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.
29. **quadrilateral** – any polygon having four sides
30. **rectangle** – a quadrilateral that has four right angles and opposite sides that are equal
31. **rhombus** – a parallelogram that has four equal sides and no right angles
32. **trapezoid** – a quadrilateral that has only one pair of parallel sides
33. **pentagon** – a five-sided polygon
34. **hexagon** – a six-sided polygon
35. **nonagon** – a nine-sided polygon
36. **decagon** – a ten-sided polygon
37. **regular polygon** – means that all sides have the same length and all the angles have the same measure
38. **perimeter** – the total distance all the way around the outside of any polygon
39. **area** – the amount of space inside a polygon
40. **area of a triangle** – one half base times height ($A = \frac{1}{2} bh$)
41. **area of a rectangle** – length times width ($A = lw$)
42. **area of a parallelogram** – base times height
43. **radius** – the distance from the center to any point on a circle
44. **diameter** – the distance across a circle, through its center
45. **chord** – a line segment whose end points both lie on a circle itself
46. **arc** – the distance between any two points on a circle itself

47. **circumference** – the distance around a circle ($2\pi r$)
48. **area of a circle** – pi times radius squared ($A = \pi r^2$)
49. **prism** – a three-dimensional shape having many sides, but only two bases
50. **volume of a rectangular solid** – length times width times height ($= lwh$)
51. **coordinate graph** – formed by two perpendicular number lines
52. **abscissa** – the horizontal axis (x-axis) of a coordinate plane
53. **ordinate** – the vertical axis (y-axis) of a coordinate plane
54. **origin** – the point at which the two axis intersect on a coordinate plane
55. **quadrants** – the four segments into which a coordinate graph is divided

WEEK SEVEN: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for **THIS** class session (Week 7).

Description and Content**Chapter Ten: Introduction to Statistics****Chapter Eleven: Graphs**

Lesson 10.1 Frequency Distribution and Graphs, pages 496-507

Frequency distribution; Statistics; Intervals; Making a frequency distribution; Grouping; Bar graphs (histograms; constructing and reading); Line graphs (drawing, constructing, and reading); Circle graphs (pie charts, constructing); Pictographs; Misuses of graphs.

Assignment: pages 503-505 #7-9, 14-16, 19-25, and 32-42 (ALL)

Lesson 10.2 Measures of Central Tendency, pages 507-513

Averages (measures) of central tendency; Mean; Median; Mode; Finding central tendency; Bimodal; Fulcrum and plank model for mean; Measures of central tendency from a frequency distribution.

Assignment: pages 511-512 #3-15 (multiples of 3), 16-21 (all), 34-41 (all)

Lesson 11.1 Cartesian Coordinate System, pages 544-551

Using ordered pairs on a map; First component; Second component; Cartesian coordinate system; Origin; Axes; Quadrants; Rectangular or Cartesian coordinates; Plotting points.

Assignment: pages 549-550 #1-4 (ALL) **and** 15-42 (multiples of 3)

Lesson 11.3 Lines, pages 557-563

Solving equations with two variables; Finding a solution for a given equation; Graphing a line; Finding ordered pairs satisfying an equation; Procedure for graphing a line; Graphing a line given in standard form; Graphing horizontal and vertical lines.

Assignment: pages 562 #3-45 (multiples of 3) and 48-49

FINAL EXAM REVIEW PRACTICE (Suggested: not required):

- Chapter 4 Self Test, page 207-208 and Chapter Review, page 210-211
- Chapter 5 Self Test, page 252-255, # 15-25 (ALL)
- Chapter 7 Self Test, page 383-384, #1-6 (ALL)
- Chapter 10 Self Test, page 533-534, 1-8 (ALL)
- Chapter 11 Self Test, page 579, #1-2 and 6-7 (ALL)

LOGISTICS CHART

Week	Hour 1	Hour 2	Hour 3	Hour 4
1	Introductions Course expectations <u>Chapter 1</u> Self Test Review and Feedback	SECTION 1.1* (review only) SECTION 1.2	<i>BREAK</i> SECTION 1.3 SECTION 1.4	SECTION 1.5 SECTION 1.6
2	Correct and review Chapter 1 <u>Chapter 2</u> SECTION 2.1	SECTION 2.2 SECTION 2.3	<i>BREAK</i> SECTION 2.4	SECTION 2.5
3	Correct and review Chapter 2 <u>Chapter 3</u> SECTION 3.1	SECTION 3.2 QUIZ #1 (Arithmetic)	<i>BREAK</i> SECTION 3.3 SECTION 3.4* (review only)	SECTION 3.5 SECTION 3.6
4	Correct and review Chapter 3 MID-TERM EXAM	<u>Chapter 4</u> SECTION 4.1	<i>BREAK</i> SECTION 4.2 SECTION 4.3	SECTION 4.4
5	Correct and review Chapter 4 <u>Chapter 5</u> SECTION 5.3	QUIZ #2 (Algebra)	<i>BREAK</i> SECTION 5.4	SECTION 7.1 SECTION 7.2
6	Correct and review Chapter 5 & 7 <u>Chapter 10</u> SECTION 10.1	QUIZ #3 (Geometry)	<i>BREAK</i> SECTION 10.2 SECTION 11.1	SECTION 11.3
7	Correct and review Chapters 10 & 11 Review: CHAPTER 4 Review: CHAPTER 5	Review: CHAPTER 7 Review: CHAPTER 10 Review: CHAPTER 11	<i>BREAK</i> FINAL EXAM	FINAL EXAM