This comprehensive and valuable study tool includes:

- Glossary of real estate math terms
- New section on closing statements, including the latest Good Faith Estimate and HUD-1 forms
- Sample closing scenario with practice problems and completed HUD-1
- Comprehensive math lessons covering everything from simple computations and calculator basics to more advanced problems involving ad valorem taxes and amortized loans
- A valuable chapter on calculating commissions
- Instruction on how to calculate rents, square footage, and leases on investment properties
- Hundreds of sample math problems, with a complete answer key
- A 50-question multiple-choice final exam; additional Instructor Resources posted online
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Preface

To be effective in the real estate business, one must become comfortable and proficient with a variety of mathematical calculations. As a real estate professional you will need to know how to compute taxes, expenses, income, and the many other figures that are a part of most real estate transactions.

This text was written to assist you in developing a higher level of competence in working with the numbers and calculations used in the real estate business. Whether you are new or experienced in the applied use of mathematics, the information that follows will help you sharpen your skills by explaining the kinds of calculations encountered during typical real estate activities. Read the explanations and directions carefully. Study the examples and work the many practice problems by applying what has been illustrated in the instructional material. With a little patience, concentration, and effort, you will become comfortable with these essential calculations.

Great care has been taken to create a text that is accurate. Because practices are often regional, check the laws and procedures applicable to your area. This is particularly true regarding legal descriptions, ad valorem taxes, transfer taxes, prorations, financing, and settlement procedures.

Special thanks for the development of this 8th edition goes out to contributing author William J. Kukla, ABR, CRS, GRI, SFR, SRES and an associate professor at Collin College in Frisco, Texas, where he instructs real estate math and other subjects. For their additional contributions in making this an accurate and reliable text, the authors and editors would like to thank the following individuals for their advice and suggestions:

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Introduction: How to Use This Book

REFRESHING YOUR MATH SKILLS

This textbook starts at a basic math level. This is done in order to provide a quick review of fundamental concepts and to offer support to students who may experience anxiety in dealing with mathematical concepts. If you feel comfortable with this introductory material, please continue on to the first chapter.

The subject matter has been broken down into a series of numbered exercises. By following the exercises, you can learn the mathematics involved in real estate transactions. Additionally, the text is designed to be augmented by classroom instruction.

The sequence of the exercises is important and designed to help you learn more efficiently. For that reason, you should not skip around in the book.

Almost every exercise presents a learning task that requires some response from you. You should be able to work the exercise or problem and arrive at the correct answer, provided you follow directions precisely, read the material, and work through the book with care.

This kind of book also provides immediate feedback by giving you the answers to the questions asked. These answers have been placed at the end of each chapter. Immediate feedback is an important part of the learning process and will enable you to determine readily how your learning is progressing.

Do not look at the correct answer until after you have solved the problem and recorded your own answer. If you look before answering, you will only impair your own learning. If you make an error, be sure you know why before proceeding to the next exercise.

Finally, this text is designed to be used as a workbook. Work through each problem by writing your computations in the spaces provided. This helps both you and your instructor when discussing the solutions.

Many students using this workbook may find themselves in a math class after several years of doing little math, and it is to this group that this text is primarily addressed. Some students have also built up a fear of math over the years. The exercises in this text will help eliminate those fears and give students sufficient knowledge and self-confidence not only to pass a licensing examination but also to function at a higher level in the field of real estate.
Neatness Counts

One reason many people have trouble with number skills is that they do not practice neatness and legibility in working out problems. For example, it is easier to make a mistake in adding these numbers:

\[
\begin{array}{c}
$12,345.67 \\
89.10 \\
5,432.08 \\
\hline
76543
\end{array}
\]

than it is to add the same numbers when care has been given to neatness and legibility:

\[
\begin{array}{c}
$12,345.67 \\
89.10 \\
5,432.08 \\
\hline
76,543.00
\end{array}
\]

It is important to keep decimal points in a straight vertical line and write each digit of each number directly beneath the one above it.

ORDER OF OPERATIONS

Problems that feature multiple operations involve several calculations. Remember, parentheses are used to identify the calculation(s) to be completed first. Also, usually you multiply or divide before adding or subtracting.

**Example:**

\[
(5 \times 6) + (3 \times 4) - (6 \times 6) = ? \\
5 \times 6 = 30 \quad 3 \times 4 = 12 \quad 6 \times 6 = 36 \\
30 + 12 - 36 = 6
\]

USING UNITS OF MEASUREMENT

Just as you cannot compare apples to oranges, numbers must be of the same kind or in the same form before you perform mathematical functions. To add these unlike things:

\[
\frac{1}{2} + \frac{1}{3}
\]

or

4 inches + 5 feet

or

6 acres + 7,890 square feet
You must first put each into similar form, such as:
\[
\frac{1}{2} = \frac{3}{6} \quad \text{and} \quad \frac{1}{3} = \frac{2}{6}
\]
or
\[
\frac{3}{6} + \frac{2}{6} = \frac{5}{6}
\]

4 inches = \frac{4}{12} or \frac{1}{3} foot

\[
\frac{1}{3} \text{ foot} + 5 \text{ feet} = 5\frac{1}{3} \text{ feet}
\]

6 acres = 43,560 square feet \times 6 = 261,360 square feet

261,360 square feet + 7,890 square feet = 269,250 square feet

**EXAMPLE:** Suppose you measure your house for carpet and find that you need 1,125 square feet. However, the carpet store prices its carpeting per square yard. What will it cost if you choose carpet priced at $18 per square yard? First, you must change the units of measurement so they are alike. For simplicity, convert the 1,125 square feet to square yards. There are nine square feet in each square yard, so:

\[
\frac{1,125 \text{ square feet}}{9 \text{ square feet/square yard}} = 125 \text{ square yards}
\]

Now the units agree, so you can compute the price:

\[
125 \text{ square yards} \times \frac{18 \text{ dollars}}{\text{square yard}} = 2,250 \text{ dollars}
\]

**Converting Units of Measurement**

Convert inches to feet by dividing inches by 12

**EXAMPLE:** 9 inches = \frac{9}{12} = 0.75 feet

Convert yards to feet by multiplying yards by 3.

**EXAMPLE:** 39 yards \times 3 = 117 feet

Convert fractions to decimals by dividing the top number (numerator) by the bottom number (denominator).

**EXAMPLE:** \[
\frac{3}{4} = 0.75
\]

Convert percentages to decimals by moving the decimal point two places to the left and adding zeros as necessary.

**EXAMPLE:**
\[
22.5\% = 0.225
\]
\[
80\% = 0.80
\]
\[
3.4\% = 0.034
\]
Introduction: How to Use This Book

Convert square feet to square yards by dividing square feet by 9.

**Example:**

\[
\frac{1125 \text{ square feet}}{9} = 125 \text{ square yards}
\]

Convert cubic feet to cubic yards by dividing cubic feet by 27.

**Example:**

\[
\frac{486 \text{ cubic feet}}{27} = 18 \text{ cubic yards}
\]

**Balancing Equations**

When you progress into simple equations, remember that the “=” (equals) sign means absolutely that. You would not write:

\[
1 + 2 = 3 + 4
\]

because 3 does not equal 7. It is not equality or an equation. It is an inequality because it is out of balance. For the equation to balance, the numbers on the left-hand side of the “=” must actually equal the numbers on the right-hand side. This power of the “=” sign cannot be overstated. While the numbers on either side of the “=” sign must balance, the numbers can be expressed in different formats. Examples will show up at numerous times throughout this text. Balancing numbers on either side of the “=” sign is one of the most useful problem-solving tools in this text and in math generally. If you think of an equation as a child’s see-saw, or a balance scale, you recognize that both sides must have the same weight at the same point or the system will tilt and not balance. Therefore, if you wish to consider the preceding example as an equation (where both sides are equal), you must either add something to the left side or subtract something from the right side:

\[
1 + 2 = 3 + 4 \quad \text{No}
\]

\[
3 = 7 \quad \text{No}
\]

but

\[
3 + 4 = 7 \quad \text{Yes}
\]

or

\[
3 = 7 - 3 - 1 \quad \text{Yes}
\]

If two numbers are related by addition (+), you can break that relationship by subtraction (−); if they are related by multiplication (×), you can break that relationship by division (÷). To illustrate:

\[
5 + 6 = 7 + x
\]

\[
11 = 7 + x
\]

The 7 is joined to x (the unknown number) by addition; therefore, you must use subtraction to balance the equation. In solving this problem, separate the knowns from the unknowns. You know all but the x. Recalling the illustration of the scale, if you subtract 7 from the right-hand
side of the equal sign, the equation will be out of balance unless you also subtract 7 from the left-hand side:

\[
11 = 7 + x \\
-7 \quad -7 \quad \text{subtracted from both sides} \\
4 = 0 + x \\
4 = x
\]

Sometimes, it is the simplest things that we forget over the years. For instance:

\[
(7 - 7) \times 8 = ?
\]

Here, you must first perform the operation indicated within the parentheses. In this case, that result is zero. To finish the calculation, zero times any other number is zero.

Also remember that a number divided by itself always equals one. So that:

\[
\frac{1}{1} = 1 \text{ or } \frac{486}{486} = 1
\]

You can also treat units of measurement or algebraic letters the same way. For example:

\[
\frac{\text{feet}}{\text{feet}} = 1 \\
\frac{\text{acres}}{\text{acres}} = 1 \\
\frac{x}{x} = 1 \\
\frac{\text{LW}}{\text{LW}} = 1
\]

Having obtained the answer 1 from any of these operations, if you then multiply that 1 by any other number or unit of measurement or algebraic symbol, the answer is that same number or unit of measurement or algebraic symbol:

\[
1 \times 23 = 23 \\
1 \times \text{foot} = \text{foot} \\
1 \times y = y \\
1 \times \text{Anything} = \text{Anything}
\]

Also, it is important to recall that you cannot divide a number by zero. However, if you divide a number by 1, you have not changed the value of the original number.

Please do not become anxious or nervous because these rules are treated so sparingly. Remember, this is merely a basic review of things you may already know or had learned in earlier math courses. The purpose of this introduction is to stir your memory, as well as to introduce briefly some of the material to be covered in following chapters.

**Remember:**
Always review your work and do a “sanity check” on the answer.
Finally, in this text, you will encounter two basic types of exercises. These include number problems—which are already set up in the proper format, such as $123 + 456 = ?$—and word, or stated, problems. To gain proficiency in solving word problems, which are similar to real-world situations, begin by analyzing each problem. Learn to recognize certain function indicators, or key words that indicate whether you should add, subtract, multiply, or divide.

**Math Language**

**Addition indicators:** plus, more than, sum, increase, and

**Subtraction indicators:** minus, less than, decrease, difference, take away

**Multiplication indicators:** of, times, factor, product

**Division indicators:** quotient, fraction, reciprocal

**Units of Measure**

**Linear measure**

12 inches = 1 foot
36 inches = 3 feet = 1 yard
5,280 feet = 1,760 yards = 1 mile

**Square measure**

144 square inches = 1 square foot
1,296 square inches = 9 square feet = 1 square yard
To convert square feet to square yards, divide square feet by 9.
To convert square yards to square feet, multiply square yards by 9.

**Cubic measure**

1,728 cubic inches = 1 cubic foot
46,656 cubic inches = 27 cubic feet = 1 cubic yard
To convert cubic feet to cubic yards, divide cubic feet by 27.
To convert cubic yards to cubic feet, multiply cubic yards by 27.

**Circular measure**

360 degrees = a circle
60 minutes = 1 degree
60 seconds = 1 minute

**Surveyor’s measure**

43,560 square feet = 1 acre
640 acres = 1 square mile = 1 section
36 sections = a township
1 township = 36 square miles

**Basic Formulas**

**For calculating area**

Length (in feet) × Width (in feet) = Square feet
To convert square feet to square yards, divide square feet by 9.

**For calculating volume**

Length (in feet) × Width (in feet) × Height (in feet) = Cubic feet
To convert cubic feet to cubic yards, divide cubic feet by 27.

**For calculating part, total, or rate* (percent)**

Total × Rate (percent) = Part
Part ÷ Rate (percent) = Total
Part ÷ Total = Rate (percent)

* Rate may be expressed as a percent or a decimal equivalent. This will be more thoroughly discussed in Chapter 1.
MATH SKILLS ASSESSMENT

When you have solved these problems, check your answers against the answers that follow.

1. 12 feet + 18 inches + 15 yards = ? feet
   a. 45
   b. 58.5
   c. 59
   d. 60

2. \[(8 \times 9) - (6 \times 7) + (4 ÷ 2)\] \times 2 = ?
   a. 48
   b. 56
   c. 64
   d. 65

3. How many cubic feet are in a carton measuring 6 feet, 8 inches by 3 yards by 4½ inches?
   a. 20.5
   b. 22.5
   c. 23.05
   d. 24.65

4. How many square yards of carpet will be required to cover a living room 18 feet by 20 feet and a dining room 15 feet by 12 feet?
   a. 40
   b. 60
   c. 360
   d. 540

5. What is the total square footage of the following three contiguous tracts of land?
   Tract one is 3 sections. Tract two is 10 acres. Tract three is 130,680 square feet.
   a. 566,388
   b. 696,960
   c. 83,678,760
   d. 84,201,480

6. What is \(\frac{3}{4}\) plus \(\frac{1}{2}\) plus \(\frac{5}{8}\) plus \(\frac{3}{4}\)?
   a. 0.647
   b. 1\(\frac{1}{2}\)
   c. 2\(\frac{1}{2}\)
   d. 2.542

7. How many square feet are in a lot that measures 75 feet across the front and is 150 feet deep?
   a. 150
   b. 450
   c. 1,250
   d. 11,250

8. If a property sold for $250,000, what total commission would the seller pay at 5½ percent?
   a. $12,000
   b. $12,500
   c. $13,750
   d. $15,000

9. A man owns 2 acres of commercially zoned property. If he sells it for $8.25 per square foot, what is the selling price?
   a. $26,626.11
   b. $79,860
   c. $718,740
   d. $6,468,660

10. How many acres are in 653,400 square feet?
    a. 15
    b. 24
    c. 29.6
    d. 150.207
SOLUTIONS: MATH SKILLS ASSESSMENT

1. (b) 18 inches ÷ 12 = 1.5 feet
   15 yards × 3 = 45 feet
   12 feet + 1.5 feet + 45 feet = 58.5 feet

2. (c) (8 × 9 = 72  6 × 7 = 42  4 ÷ 2 = 2)
   (72 – 42 + 2) × 2 = 64
   32 × 2 = 64

3. (b) 8 inches ÷ 12 = 0.667 feet
   0.667 feet + 6 feet = 6.667 feet
   3 yards × 3 = 9 feet
   4.5 inches ÷ 12 = 0.375 feet
   6.667 feet × 9 feet × 0.375 feet = 22.5 cubic feet

4. (b) 18 feet × 20 feet = 360 square feet
   15 feet × 12 feet = 180 square feet
   360 square feet + 180 square feet = 540 square feet
   540 square feet ÷ 9 = 60 square yards

5. (d) 3 sections × 640 acres × 43,560 square feet = 83,635,200 square feet
   10 acres × 43,560 square feet = 435,600 square feet
   83,635,200 square feet + 435,600 square feet + 130,680 square feet = 84,201,480 square feet

6. (d) 2 + 3 = 0.667  1 ÷ 2 = 0.5  5 ÷ 8
    = 0.625  3 ÷ 4 = 0.75
    0.667 + 0.50 + 0.625 + 0.75 = 2.542

7. (d) 75 feet × 150 feet = 11,250 square feet

8. (c) 5.5% = 0.055
    0.055 × $250,000 = $13,750

9. (c) 2 acres × 43,560 square feet = 87,120 square feet
    87,120 square feet × $8.25 = $718,740

10. (a) 653,400 square feet ÷ 43,560 square feet = 15 acres
STUDY STRATEGY

It seems appropriate to open our discussion of study strategy with a brief mention of an experience common among students of mathematics: math anxiety. Many people are intimidated by the anticipated difficulties of working math problems, to the point of becoming victims of stress. This book does not provide a psychological analysis of this matter. Rather, the author has set forth some principles that will help students feel more comfortable with math.

Anxiety about one’s ability to perform mathematical calculations is very common. Even college mathematics majors often dread math examinations! If this is so, how can this book effectively help people who have no special background in mathematics, who suddenly find that they need some basic math skills to pass a licensing examination or function more competently as a real estate licensee?

In an article “Mastering Math Anxiety,” Dr. William L. Boyd of Hardin Simmons University and Elizabeth A. Cox of Howard Payne University offer several ideas:

1. Math anxiety is not an indication of inability. It may be more an indication of excessive concern over possible embarrassment in front of our peers, our instructors, our clients, or our customers.
2. Aptitude in math is not necessarily something we are born with. Our aptitude may reflect our attitude rather than our genes. The old saying, “If you think you can or if you think you can’t, you’re right,” certainly applies in this situation. Through practice and study, we can build our skills and our confidence.
3. Self-image can affect our performance in many areas, including math. Make a determined effort to develop your competency in math. If others expect you to fail, don’t fall to the level of their expectations. Rather, rise to the level of your potential through a little extra effort.
4. Learn to congratulate yourself on your successes. When you arrive at a correct solution, make a point of giving yourself the credit for your success.1

STRATEGIES THAT WILL BENEFIT YOU

1. Take time to carefully read and understand what is being asked. Consider the information given in the problem and decide how each portion relates to the solution. Careful and thoughtful reading will help you understand the problem.
2. Learn to discard those facts that have no bearing on the solution. You do this automatically in many areas of everyday life. Begin to practice this in math, also, by evaluating each bit of information.
3. Make a special effort to be neat. Sloppy figures carelessly jotted down are an invitation to error.
4. Develop a systematic approach to problem solving. Consider each aspect of the problem in its proper place and do not jump to conclusions. It is better to write down each step in the solution, no matter how trivial it seems, than to rely on performing a calculation “in your head.”

5. Learn to restate the problem in your own words. By doing this, you can remove many obstacles to a solution. In fact, once you state the problem correctly, you need only perform the mechanics of the arithmetic accurately to arrive at the solution.

6. Form the habit of checking and double-checking your work. It is all too easy to make a mistake out of carelessness. If an error in calculation is not discovered, your solution will be flawed.

7. Request help when you need it. Don’t hesitate to ask questions! Others who are puzzled by the same point as you may be reluctant to say so. If you ask the question, you and the entire class benefit.

8. Learn to question the reasonableness of the solution. If the answer you have calculated seems unlikely, perhaps it is. Your common sense can often reveal an error due to carelessness.

9. Become proficient with your calculator. The calculator’s accuracy helps ensure your good results. But never rely on the machine to do it all! Learn to make your own estimate and compare this with the results of the calculator. If the calculator’s answer does not seem plausible, clear the display and work the problem again, making sure you enter the figures and operations correctly. The calculator does not replace you. But it is a wonderful tool to enhance your professionalism.

**Exercises and Examinations**

Each chapter concludes with Additional Practice problems, consisting of a series of multiple-choice questions patterned after those found in state licensing examinations. Solutions to the problems appear at the end of each chapter.

At the end of this book, you will find a 50-question Review Exam. Answers to all examination questions are in the Answer Key at the end of the exam. These solutions show the step-by-step mathematics.

**Local Practices**

Because this textbook is used nationally, some of the situations described may differ from practice in your local area. Therefore, your instructor may wish to skip the portions of the textbook that are not applicable to your area.

**CALCULATORS**

Calculators can be divided into general types by the form of logic they use. Chain logic and algebraic logic are the most common types. The difference between these two types of logic is illustrated as follows. Consider the calculation:

\[ 2 + 3 \times 4 = ? \]

If the numbers and arithmetic functions are entered into the chain logic calculator as shown above, the answer will be 20; on the algebraic logic calculator, the answer will be 14. The chain logic sees the data entered in the order that it is keyed in:

\[
\begin{align*}
2 + 3 &= 5, \\
5 \times 4 &= 20,
\end{align*}
\]
whereas the algebraic logic follows the order of multiplication, division, addition, and then subtraction:

\[ 3 \times 4 = 12, \text{ then } 12 + 2 = 14. \]

Some chain logic calculators use reverse polish notation, where there is no “=” key. In its place is an “ENTER” key. Use the previous example of:

\[ 2 + 3 \times 4 =? \]

Data on most calculators are entered using chain logic, just as the user would write it:

- Press 2
- Press +
- Press 3
- Press ×
- Press 4 Answer
- Press = 20

The reverse polish notation keystrokes, however, are as follows:

- 2
- enter
- 3
- +
- 4 Answer
- × 20

Because most calculators use chain logic, the examples in this text are designed to fit that type. However, you should thoroughly study the manual furnished with your calculator for instructions on how to enter data.

**Four-Function versus Multifunction Calculators**

A basic four-function calculator will certainly be sufficient for this course, but if you plan to purchase a calculator, it is strongly recommended that you spend a few more dollars on one
having financial functions, such as the BA II PLUS from Texas Instruments, or the 10B II from HP. This type of calculator can be easily identified by these additional keys:

\[
\begin{align*}
\text{n} & \quad \text{i} \quad \text{PMT} \quad \text{PV} \quad \text{FV}
\end{align*}
\]

where

- \( n \) is the number of interest compounding periods;
- \( i \) is the amount of interest per compounding periods;
- \( PMT \) is the payment;
- \( PV \) is the present value; and
- \( FV \) is the future value

When attempting to use these tools, carefully study the owner’s manual that comes with the machine to become thoroughly familiar with its features and capabilities. Keep the handy reference card with the machine in case you forget how to perform one of the functions. Be extra careful when entering numbers on the keypad of your calculator. It is not unusual for students to understand the math yet get the wrong answer because of operator error in using the calculator.

**Differences in Rounding**

Calculators may display six, eight, or ten digits, but regardless of the number, a calculator retains far more numbers than are displayed in a calculation. For example, if a calculator displays six digits, or single numbers, such as 123456, the calculator knows what follows the last digit, or single number, displayed. This last digit depends on whether the calculator rounds or truncates. Consider an answer of 123456.7. This calculation displayed on a six-digit calculator will be 123457 for a calculator that rounds and 123456 for a calculator that truncates.

*Rounds* means that if the next digit not displayed is less than 5, the last digit to be displayed remains the same. However, if the next digit not displayed is greater than or equal to 5, the last digit to be displayed will be increased or rounded up to the next larger digit.

*Truncates* means that regardless of the value of the next digit not displayed, the calculator merely cuts off the display, or truncates, when its display capacity is full. Greater calculator accuracy can be obtained if you leave the answer on the display and perform the next calculation by depressing additional keys, rather than if you write down the answer, clear the calculator, and re-enter that number as the first step of the following calculation. Leaving the answer on the display is the default approach and the one that is recommended. Re-entering numbers significantly increases your chances of making unnecessary errors! Your instructor will direct you as to how many digits beyond the decimal point to leave in an answer. It will be important at times to get the exact answer to, let’s say, 5 decimal places for a learning moment. Other times having a close answer because of rounding differences will be acceptable. Again, using calculators with similar function capability will allow for identical answers between instructor and student.
PARTS, PIECES, AND TOTALS
Fractions, Decimals, and Percentages

Most of the math you will encounter in real estate will require you to be comfortable with fractions, decimals, and percentages. When you have completed your work in Chapter 1, you will be able to

- accurately convert percentages and fractions to decimals,
- apply the basic formulas for problem solving for part, total, or rate (percentage), and
- use the following diagram as a tool in solving total, rate, and part problems:
At the outset of this chapter, a word about calculators is important. Most calculators have a “%” key, which requires fewer keystrokes to calculate percentages. However, owing to the various ways of entering data on different calculators, this text will use decimals in all problems and solutions.

A part of the total can be expressed as a

- **Fraction**
  
  **Example:** 25 is \( \frac{1}{4} \) of 100

- **Decimal**
  
  **Example:** 25 is 0.25 of 100

- **Percentage**
  
  **Example:** 25 is 25 percent of 100

To convert a fraction to a decimal, divide the fraction's top number (numerator) by its bottom number (denominator).

**Example:**

\[
\frac{7}{8} = \frac{7}{8} \times \frac{100}{100} = 0.875
\]

To convert a percentage to a decimal, move the decimal two places to the left and drop the percent sign. If necessary, add zeros.

**Example:**

- 75% = 0.75
- 3.5% = 0.035
CONVERTING FRACTIONS TO DECIMALS

Proper Fractions

A proper fraction is one whose numerator is less than its denominator. It is a part of the total, and its value is always less than 1.

**Example:**

\[
\frac{1}{2}, \quad \frac{1}{4}, \quad \frac{1}{5}, \quad \frac{5}{19}, \quad \frac{7}{100}
\]

The **numerator** (top number of a fraction) indicates how many parts there are in the fractional amount.

The **denominator** (bottom number of a fraction) indicates how many parts make up the whole.

The fraction \( \frac{1}{2} \) means 1 part of the total that is made up of 2 equal parts.

The fraction \( \frac{3}{4} \) means 3 parts of the total that is made up of 4 equal parts.

The figure 35 percent means 35 parts out of the 100 parts that make up the total. It can also be written as the fraction \( \frac{35}{100} \) or as the decimal 0.35.

1. Convert the following fractions to decimals.
   a. \( \frac{1}{5} \)
   b. \( \frac{1}{2} \)
   c. \( \frac{5}{100} \)
   d. \( \frac{97}{100} \)

**Note:** The answers for chapter problems are located at the end of each chapter.
Improper Fractions

An improper fraction is one whose numerator is equal to or greater than its denominator. The value of an improper fraction is more than 1.

**Example:**

\[
\begin{array}{ccc}
\frac{5}{4} & \frac{10}{9} & \frac{81}{71}
\end{array}
\]

To change an improper fraction to a whole number, divide the numerator by the denominator. Any part left over will be shown as a decimal.

**Example:** Change \( \frac{8}{5} \) to a whole number.

\[
\frac{8}{5} = 1.6
\]

2. Change the following improper fractions to whole numbers.

- a. \( \frac{5}{4} \)
- b. \( \frac{9}{2} \)
- c. \( \frac{16}{5} \)
- d. \( \frac{26}{9} \)

Mixed Numbers

A mixed number (a whole number and a fraction), such as 1\( \frac{3}{4} \), can be changed by converting the fraction to a decimal (divide the top number by the bottom number) and adding back the whole number.

**Example:**

\[
1\frac{3}{4}
\]

\[
3 \div 4 = 0.75
\]

\[
0.75 + 1 = 1.75
\]
3. Change the following mixed numbers to whole numbers plus decimal equivalents.
   a. \( 2\frac{1}{4} \)
   b. \( 3\frac{2}{5} \)
   c. \( 8\frac{1}{4} \)
   d. \( 1\frac{1}{6} \)

4. Convert the following fractions to decimals.
   a. \( \frac{8}{5} \)
   b. \( \frac{9}{10} \)
   c. \( \frac{6}{7} \)
   d. \( \frac{34}{100} \)
   e. \( \frac{50}{10} \)
   f. \( \frac{3}{12} \)
   g. \( \frac{81}{21} \)
h. \( \frac{13}{3} \)

i. \( 9\frac{3}{4} \)

j. \( 108\frac{3}{10} \)

**PERCENTAGES**

Percent (\%) means per hundred or per hundred parts.

*per means by the*

*cent means 100*

For example, 50 percent means 50 parts out of a total of 100 parts (100 parts equal 1 whole), and 100 percent means all 100 of the 100 total parts, or 1 whole unit. Throughout this book, we shall refer to 100 percent as the total.

50 percent means \( \frac{50}{100} \), or 0.50, or \( \frac{1}{2} \)

100 percent means \( \frac{100}{100} \), or 1.00, or 1

**CONVERTING DECIMALS TO PERCENTAGES**

To change a decimal into a percentage, move the decimal point two places to the right and add the “\( \% \)” sign. Therefore, you can change the number 0.50 to a percentage by moving the
decimal point (.) two places or two digits to the right and adding the percent symbol (%). By moving the decimal point two places to the right, you actually multiply 0.50 by 100, to equal 50. When you add the percent symbol, you multiply the 0.50 by 100 according to the definition of percent, so that 0.50 equals 50 percent. Thus, the actual value hasn’t changed at all, or you are back where you started.

Any percentage that is less than 100 percent means a part or fraction of 100 percent or the entire unit. For example, because 99 percent means 99 parts out of 100 parts, it is less than the total.

**Examples:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>10%</td>
</tr>
<tr>
<td>1.00</td>
<td>100%</td>
</tr>
<tr>
<td>0.98</td>
<td>98%</td>
</tr>
<tr>
<td>0.987</td>
<td>98.7%</td>
</tr>
</tbody>
</table>

5. Change the following decimals to percentages.
   a. 0.37
   b. 0.09
   c. 0.080
   d. 0.10000
   e. 0.7095
   f. 0.01010

**CONVERTING PERCENTAGES TO DECIMALS**

The process of converting percentages to decimals is the reverse of the one you just completed. To change a percentage to a decimal, move the decimal point two places to the left and drop the “%” sign.
All numbers have a decimal point, although it is usually not shown when only zeros follow it.

**Examples:**
- 99 is really 99.0
- 6 is really 6.0
- $1 is the same as $1.00

So, percentages can be readily converted to decimals.

**Examples:**
- 99% = 0.99
- 6% = 0.06
- 5% = 0.05
- 70% = 0.70

Note: Adding zeros to the right of a decimal point after the last figure does not change the value of the number.

6. Change the following percentages to decimals.
   a. 1 percent
   b. 65 percent
   c. 75.5 percent
   d. 2.1 percent
7. Complete the following chart.

<table>
<thead>
<tr>
<th>Simple Fraction</th>
<th>Decimal</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td>75%</td>
</tr>
<tr>
<td>b. $\frac{1}{10}$</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>d. $\frac{1}{8}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. $\frac{3}{10}$</td>
<td></td>
<td>67%</td>
</tr>
<tr>
<td>f.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g.</td>
<td>0.56</td>
<td></td>
</tr>
</tbody>
</table>

**ADDING DECIMALS**

Decimals are added like whole numbers. When you add longhand, decimal points must be lined up under each other, as shown in the examples.

**EXAMPLES:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>0.3</td>
<td>0.891</td>
</tr>
<tr>
<td>5</td>
<td>0.005</td>
<td>0.05</td>
</tr>
<tr>
<td>+ 590</td>
<td>+ 0.59</td>
<td>+ 0.063</td>
</tr>
<tr>
<td>895</td>
<td>0.895</td>
<td>1.004</td>
</tr>
</tbody>
</table>

8. Add the following decimals.

a. 0.05
   0.2
   + 0.695

b. 0.0983
   0.006
   + 0.32

**SUBTRACTING DECIMALS**

Decimals are subtracted like whole numbers. Again, line up the decimal points.

**EXAMPLES:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>861</td>
<td>0.861</td>
<td>0.549</td>
</tr>
<tr>
<td>− 190</td>
<td>− 0.190</td>
<td>− 0.32</td>
</tr>
<tr>
<td>671</td>
<td>0.671</td>
<td>0.229</td>
</tr>
</tbody>
</table>
9. Practice adding and subtracting the following decimals.
   a. \(0.23 + 0.051 + 0.6\)
   b. \(0.941 - 0.6\)
   c. \(0.588 - 0.007\)
   d. \(0.741 + 0.005 + 0.72\)

**MULTIPLYING DECIMALS**

Decimal numbers are multiplied like whole numbers. When entering decimal numbers in your calculator, be sure to enter the decimal point in the proper place. A misplaced decimal point will yield an incorrect answer.

10. Practice multiplying the following decimals.
    a. \(0.100 \times 3\)
    b. \(4.006 \times 0.51\)
    c. \(0.035 \times 0.012\)

**DIVIDING DECIMALS**

You may divide a whole number by a decimal number.

**EXAMPLE:**

\[6 \div 0.50 = 12\]
You may divide a decimal number by a whole number.

**Example:**

\[
0.50 \div 6 = 0.083
\]

11. Practice dividing the following decimals.

a. \(2 \div 0.08\)

b. \(0.36 \div 3\)

c. \(0.15 \div 5\)

**Percentage Problems**

Percentage problems usually involve three elements: the rate (percent), the total, and the part.

**Example:**

5% of 200 is 10

\[
\begin{array}{c}
\text{rate} \\
\text{total} \\
\text{part}
\end{array}
\]

A problem involving percentages is really a multiplication problem. To solve the problem in the example below, first convert the percentage to a decimal, then multiply.

**Example:**

What is 25 percent of 300?

\[
25\% = 0.25
\]

\[
300 \times 0.25 = 75
\]

A generalized formula for solving percentage problems follows:

\[
\text{Total} \times \text{Rate (percent)} = \text{Part}
\]

(or, \(\text{Rate} \times \text{Total} = \text{Part}\; \text{the order of multiplication is not important}\))

To solve a percentage problem, you must know the value of two of the three elements of this formula. The value that you must find is called the unknown (most often shown in the formula as \(x\)).

**Example:** A woman purchased a secondhand Smartphone at 45 percent of the original cost, which was $150. What did she pay for the unit?

\[
\text{Rate} \times \text{Total} = \text{Part}
\]

\[
45\% \times \$150 = \text{Part}
\]

\[
45 \times \$150 = \$67.50
\]
12. If a man spent 60 percent of his total savings of $3,000, how much did he spend? What formula will you use to solve the problem?

**FORMULAS**

When working with problems involving percentages or decimal equivalents, use one of the formulas discussed below.

When you know the total (which always equals 100 percent) and you know the rate (percent) and you are looking for the part, use the following formula:

\[ \text{Total} \times \text{Rate (percent)} = \text{Part} \]

When you know the part and the total and you are looking for the rate, use the following formula:

\[ \text{Part} \div \text{Total} = \text{Rate} \]

When you know the part and the rate and you are looking for the total, use the following formula:

\[ \text{Part} \div \text{Rate} = \text{Total} \]

Many math students have found it helpful to use a circle as an aid in solving for the answer. The part always goes in the top section; the total goes in the lower left section, and the rate (perhaps expressed as a percentage or a decimal equivalent) goes in the lower right section. Enter the two known numbers in their proper places and solve for the unknown by either dividing or multiplying. If your known numbers include one above and one below the horizontal line, divide the top number by the bottom number to solve for the unknown. If your known numbers are side by side, separated by the vertical line, multiply.
**Example:** An acre contains 43,560 square feet. How many square feet are in 40 percent of an acre?

40% = 0.40

43,560 square feet (total) × 0.40 (rate) = 17,424 square feet (part)

**Example:** What percentage of an acre does 17,424 square feet represent?

17,424 square feet (part) ÷ 43,560 square feet (total) = 0.40 (rate)

Remember, if you want to express the rate as a percentage, you must move the decimal point two places to the right and add the “%” sign. Therefore, in the above example, 0.40 equals 40 percent.

**Example:** 17,424 square feet is 40 percent of an acre. How many square feet are in an acre?

40% = 0.40

17,424 square feet (part) ÷ 0.40 (rate) = 43,560 square feet (total)

Always remember the following information:

- You can find any one of the three elements if you know the other two.
- The long horizontal line separates the circle into division areas.
- The short vertical line separates the circle into multiplication areas.

Knowing this, you can cover the portion of the circle that contains the unknown (or what you are looking for), then perform the indicated multiplication or division.

Applying this to the previous example in which you found 40 percent of 43,560, the part was the unknown. If you cover up the portion of the circle labeled \( \text{Part} \), you are left with \( \text{Total} \) and \( \text{Rate} \), separated by a multiplication function.

However, in the example in which you determined 17,424 square feet to be 40 percent of an acre, you looked for the rate. By covering up this part of the circle, you leave \( \text{Part} \) and \( \text{Total} \) separated by a division function.
This shortcut can be used to solve many types of problems, including the following.

**Example:** If 30 percent of the 1,500 houses in your area have four bedrooms, how many houses have four bedrooms?

We know:
- Rate = 30%, or 0.30
- Total = 1,500

Cover Part.
- Total × Rate = ?
- \(1,500 \times 0.30 = 450\)

13. If 20 percent (or 500) of the houses in your area are less than five years old, how many houses are there in your area?

14. Which of the following values is missing from this problem: 6 is 12 percent of what number?
   - a. Total
   - b. Part
   - c. Rate
   - d. None of the above

**Example:** 30 is 50 percent of what number?

The suggested problem-solving sequence is as follows:

**Step 1.** Read the problem carefully.

**Step 2.** Analyze the problem, pick out the important factors, and put those factors into a simplified question.

**Step 3.** State the formula.
- \(\frac{\text{Part}}{\text{Rate}} = \text{Total}\)

**Step 4.** Substitute values.
- \(\frac{30}{0.50} = \text{Total}\)

**Step 5.** Solve the problem.
- \(\frac{30}{0.50} = 60\)
15. 1,500 is 300 percent of what number?

**Step 1.** Read the problem.

**Step 2.** Analyze the problem.

**Step 3.** State the formula.

**Step 4.** Substitute values.

**Step 5.** Solve the problem.

16. Try to solve the following problem without referring back to material in this chapter: $125,000 is 20 percent of what dollar amount?

**Example:** What percentage of 56 is 14?

Note that the rate element is missing. By covering “Rate” in the circle to the right, you know to divide the part by the total:

$$\frac{\text{Part}}{\text{Total}} = \text{Rate}$$

Next, substitute the values from the problem for those elements in the new formula:

$$\frac{14}{56} = \text{Rate}$$

Then divide:

$$\frac{14}{56} = 0.25$$

Finally, convert the decimal to a percentage:

$$0.25 = 25\%$$
**EXAMPLE:** What percentage of 87 is 17?

**Step 1.** Read the problem.

**Step 2.** Analyze the problem.

**Step 3.** State the formula. \( \frac{\text{Part}}{\text{Total}} = \text{Rate} \)

**Step 4.** Substitute values. \( \frac{17}{87} = \text{Rate} \)

**Step 5.** Solve the problem. \( \frac{17}{87} = 0.195 \)

**Step 6.** Convert the decimal 0.195 = 19.5% to a percentage.

17. What percentage of 95 is 18?

**REMEMBER:** This diagram will help you remember the formulas for part, total, and rate.

Because **Part** is over **Rate**, make a fraction of these two elements when looking for a **Total**.

\( \frac{\text{Part}}{\text{Rate}} = \text{Total} \)

Because **Part** is over **Total**, make a fraction of these two elements when looking for a **Rate**.

\( \frac{\text{Part}}{\text{Total}} = \text{Rate} \)

Because **Rate** and **Total** are both in the lower part of the diagram, multiply these two elements when looking for a **Part**.

\( \text{Total} \times \text{Rate} = \text{Part} \)

Now try some problems related to the real estate field, using what you've learned about rates (percentages), fractions, and decimals.
18. A lot is assessed at 42 percent of its market value of $150,000. What is its assessed value?
   a. What is the unknown value?
   b. State the formula.
   c. Solve the problem.

19. A bank-owned property sold for $81,000, which was 90 percent of the original price. What was the original list price?
   a. What is the unknown value?
   b. State the formula.
   c. Solve the problem.

20. A property has an assessed value of $115,000. If the assessment is 34 percent of market value, what is the market value?
   a. What is the unknown value?
   b. State the formula.
   c. Solve the problem. Round off your answer to the nearest hundred dollars.
**PERCENTAGE OF CHANGE**

If you hear that houses in your area have increased in value by 3 percent during the past year, and you know that the average price of houses sold last year was $160,000, what portion of the sales price was related to the increased value?

You know the total and rate, so:

\[ \$160,000 \times 0.03 = \$4,800 \]

Consider a similar problem from a different starting point: If the average price of one-bedroom condominiums today is $70,000 compared to $60,000 one year ago, what is the percentage of change?

First, find the amount of change: $70,000 – $60,000 = $10,000. Next, use the circle aid to find the rate of change:

\[ \frac{\$10,000 \text{ (part)}}{\$60,000 \text{ (total)}} = 0.167, \text{ or } 16.7\% \text{ (rate)} \]

Or remember this general formula:

\[ \frac{\text{New value} - \text{Old value}}{\text{Old value}} = \text{Rate (percent) of change} \]

21. If there were 800 foreclosures this year and 700 last year, what is the percentage of change?

Suppose that this year’s foreclosures numbered 700 and last year’s equaled 800. What is the percentage of change?

\[
\begin{align*}
\text{New value} &= 700 \\
\text{Old value} &= 800 \\
\text{Difference} &= \frac{<100> \text{ (negative number)}}{<100> \text{ (part)}} \div 800 \text{ (total)} = <0.125> \text{ (rate)}, \text{ or } <12.5\%>
\end{align*}
\]

This means the change occurred in a downward, or negative, direction.

**REMEMBER:** Fractions, decimals, and percentages are all interrelated.

To convert a fraction to a decimal, divide the top number by the bottom number.

To convert a percentage to a decimal, move the decimal two places to the left and drop the “%” sign.
To convert a decimal to a percentage, move the decimal two places to the right and add the “%” sign.

To solve problems, always convert fractions and percentages to decimals.

Use the circle aid to assist you in solving for an unknown number.

Total × Rate = Part
Part ÷ Rate = Total
Part ÷ Total = Rate

In real estate practice, you will use these formulas in many situations. The following circles show some of the more common ones.
You have now completed Chapter 1. If you feel you understand the material in this chapter, work the Additional Practice problems that follow. After working the problems, you may find that you are unsure about certain points. Review those points before continuing with the next chapter.
**ADDITIONAL PRACTICE**

When you have finished these problems, check your answers against those at the end of the chapter. If you miss any of the problems, review this chapter before going on to the next chapter.

1. Convert the following to decimals.
   a. 3.875% =
   b. 20\% =
   c. \(\frac{5}{6}\) =
   d. 5% =
   e. 348% =

2. A house listed for $155,000 and sold for 90 percent of the list price. What was the sales price of the house?
   a. $139,500
   b. $147,250
   c. $160,500
   d. $170,500

3. A seller sold his house for $240,000, which was 92 percent of the list price. What did the house list for? Round off your answer to the nearest hundred dollars.
   a. $220,800
   b. $226,780
   c. $260,800
   d. $260,900

4. A buyer purchased her home for $250,000. She later sold it for $281,250. What percentage profit did she realize on her investment?
   a. 11.1 percent
   b. 12.5 percent
   c. 14.5 percent
   d. 110 percent

5. A salesperson at ABC Realty sold 86 of the 432 homes sold by her firm last year. What percentage of the sales did she complete?
   a. 19 percent
   b. 19.9 percent
   c. 20 percent
   d. 23.3 percent

6. The assessed value of a residence is 22 percent of the market value of $398,000, which is
   a. $87,300.
   b. $87,485.
   c. $87,560.
   d. $88,500.

7. The office in which you work sold 128 homes last year. You sold 29 of these. Your sales are what percentage of the total sales?
   a. 21.7 percent
   b. 22.7 percent
   c. 44.13 percent
   d. 46.07 percent

8. What percentage of $800 is $420?
   a. 1.9 percent
   b. 5.25 percent
   c. 19 percent
   d. 52.5 percent

9. Mr. Smith received a proceeds check at closing for $67,500. His lot sold for $75,000. What percentage of the sales price did Mr. Smith receive?
   a. 11.1 percent
   b. 90 percent
   c. 94 percent
   d. 99 percent

10. A property is assessed at 53 percent of market value. What is the assessed value of that property if it has a market value of $125,000?
    a. $53,000
    b. $66,250
    c. $191,250
    d. $235,849
11. What percentage of 125,000 is 18,750?
   a. 1.7 percent
   b. 6.67 percent
   c. 15 percent
   d. 85 percent

12. Which of the following formulas is NOT correct?
   a. Part \times Rate = Total
   b. Rate \times Total = Part
   c. Part \div Total = Rate
   d. Part \div Rate = Total

13. A local company bought a commercial lot for $600,000 and sold it several years later for $1,080,000. The company's percentage of profit is
   a. 44 percent
   b. 80 percent
   c. 100 percent
   d. 180 percent

14. One-sixth is equal to what percent?
   a. 1.65 percent
   b. 8.25 percent
   c. 12.5 percent
   d. 16.7 percent

15. What is the decimal equivalent of \(3\frac{3}{4}\)?
   a. 0.0375
   b. 0.375
   c. 3.75
   d. 37.5

16. You sold 58 of the 256 homes sold by your real estate company last year. What percentage of the homes did others sell in your company?
   a. 53.93 percent
   b. 55.87 percent
   c. 77.3 percent
   d. 78.3 percent

17. What percentage of 250,000 is 37,500?
   a. 1.7 percent
   b. 6.67 percent
   c. 15 percent
   d. 85 percent

18. A 64,000-square-foot hillside lot is to be subdivided and sold. One-fourth of the lot is too steep to be useful; \(\frac{3}{16}\) of the lot is taken up by a small stream. The remaining area is flat. If \(\frac{1}{5}\) of the usable area is reserved for roads, how many square feet of usable area are left?
   a. 28,000 square feet
   b. 31,500 square feet
   c. 36,000 square feet
   d. 36,750 square feet

19. A tract of land is divided as follows: \(\frac{1}{4}\) is being developed into building lots; \(\frac{5}{10}\) is being cultivated; the remaining portion is 112.5 acres. How many total acres are there in the parcel?
   a. 84 acres
   b. 150 acres
   c. 225 acres
   d. 450 acres

20. You want to build a 2,000-square-foot single-story home on a 7,500 square-foot-lot. A city ordinance permits up to 35 percent of the lot to be covered by structures. Your proposed development will cover approximately how much of the lot?
   a. 18 percent
   b. 27 percent
   c. 37 percent
   d. 40 percent
SOLUTIONS: PROBLEMS IN CHAPTER 1

1. a. \( \frac{1}{5} = 0.2 \)
   b. \( \frac{1}{2} = 0.5 \)
   c. \( \frac{1}{100} = 0.05 \)
   d. \( \frac{97}{100} = 0.97 \)

2. a. \( \frac{3}{4} = 1.25 \)
   b. \( \frac{3}{2} = 4.5 \)
   c. \( \frac{16}{5} = 3.2 \)
   d. \( \frac{26}{9} = 2.889 \)

3. a. \( 1 \div 4 = 0.25 \)
   0.25 + 2 = 2.25
   b. \( 2 \div 3 = 0.667 \)
   0.667 + 3 = 3.667
   c. \( 1 \div 4 = 0.25 \)
   0.25 + 8 = 8.25
   d. \( 5 \div 6 = 0.833 \)
   0.833 + 1 = 1.833

4. a. \( 8 \div 5 = 1.6 \)
   b. \( 9 \div 10 = 0.9 \)
   c. \( 7 \div 8 = 0.875 \)
   0.875 + 6 = 6.875
   d. \( 34 \div 100 = 0.34 \)
   e. \( 52 \div 10 = 5.2 \)
   f. \( 3 \div 12 = 0.25 \)
   g. \( 81 \div 71 = 1.141 \)
   h. \( 13 \div 3 = 4.333 \)
   i. \( 3 \div 4 = 0.75 \)
   0.75 + 9 = 9.75
   j. \( 6 \div 10 = 0.6 \)
   0.6 + 108 = 108.6
5. a. 0.37 = 37%
   b. 0.09 = 9%
   c. 0.080 = 8%
   d. 0.10000 = 10%
   e. 0.7095 = 70.95%
   f. 0.01010 = 1.01%

6. a. 1% = 0.01
   b. 65% = 0.65
   c. 75.5% = 0.755
   d. 2.1% = 0.021

7. | Simple Fraction | Decimal | Percent |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>a. ( \frac{75}{100} = \frac{3}{4} )</td>
<td>0.75</td>
<td>75%</td>
</tr>
<tr>
<td>b. ( \frac{1}{10} )</td>
<td>0.10</td>
<td>10%</td>
</tr>
<tr>
<td>c. ( \frac{80}{100} = \frac{4}{5} )</td>
<td>0.80</td>
<td>80%</td>
</tr>
<tr>
<td>d. ( \frac{1}{8} )</td>
<td>0.125</td>
<td>12.5%</td>
</tr>
<tr>
<td>e. ( \frac{3}{10} )</td>
<td>0.30</td>
<td>30%</td>
</tr>
<tr>
<td>f. ( \frac{67}{100} )</td>
<td>0.67</td>
<td>67%</td>
</tr>
<tr>
<td>g. ( \frac{56}{100} = \frac{14}{25} )</td>
<td>0.56</td>
<td>56%</td>
</tr>
</tbody>
</table>

8. a. 0.05 + 0.2 + 0.695 = 0.945
   b. 0.983 + 0.006 + 0.32 = 1.309

9. a. 0.23 + 0.051 + 0.6 = 0.881
   b. 0.941 – 0.6 = 0.341
   c. 0.588 – 0.007 = 0.581
   d. 0.741 + 0.005 + 0.72 = 1.466

10. a. 0.100 × 3 = 0.3
   b. 4.006 × 0.51 = 2.04306
   c. 0.035 × 0.012 = 0.00042

11. a. 2 ÷ 0.08 = 25
   b. 0.36 ÷ 3 = 0.12
   c. 0.15 ÷ 5 = 0.03
12. \[ \text{Total} \times \text{Rate} = \text{Part} \]
   \[ $3,000 \times 0.60 = $1,800 \]

13. \[ 500 \text{ (part)} \div 0.20 \text{ (rate)} = 2,500 \text{ – houses (total)} \]

14. a. Total. The part is 6 and the rate is 12 percent. Therefore, 6 divided by 0.12 equals 50

15. Step 3. Part \div Rate = Total
   Step 4. 1,500 (part) \div 3 (rate) = Total
   Step 5. 1,500 (part) \div 3 (rate) = 500 (total)

16. Part \div Rate = Total
   20\% = 0.20
   \[ $125,000 \div 0.20 = $625,000 \]

17. Part \div Total = Rate
   \[ 18 \div 95 = 0.189473684 \text{ or } 18.9\% \]

18. a. Part
   b. Total \times Rate = Part
   c. $150,000 \times 0.42 = $63,000

19. a. Total
   b. Part \div Rate = Total
   c. 90\% = 0.90
   \[ $81,000 \div 0.90 = $90,000 \]

20. a. Total
   b. Part \div Rate = Total
   c. 34\% = 0.34
   \[ $115,000 \div 0.34 = $338,235.29 \text{ or } $338,235 \text{ (rounded)} \]

21. 800 – 700 = 100
   \[ 100 \div 700 = 0.143 \text{ or } 14.3\% \]
SOLUTIONS: ADDITIONAL PRACTICE

1. a. 3.875% = 0.03875  
    b. 20/10 = 2  
    c. 1/6 = 0.167  
    d. 5% = 0.05  
    e. 348% = 3.48

2. (a) 0.9 × $155,000 = $139,500

3. (d) $240,000 ÷ 0.92 = $260,869.57 or $260,900 (rounded)

4. (b) $281,250 – $250,000 = $31,250  
    $31,250 ÷ $250,000 = 0.125 or 12.5%

5. (b) 86 ÷ 432 = 0.199074 or 19.9%

6. (c) $398,000 × 0.22 = $87,560

7. (b) 29 ÷ 128 = 0.227 or 22.7%

8. (d) $420 ÷ $800 = 0.525 or 52.5%

9. (b) $67,500 ÷ $75,000 = 0.9 or 90%

10. (b) $125,000 × 0.53 = $66,250

11. (c) 18,750 ÷ 125,000 = 0.15 or 15%

12. (a) Part × Rate = Total

13. (b) $1,080,000 – $600,000 = $480,000  
    $480,000 ÷ $600,000 = 0.8 or 80%

14. (d) 1 ÷ 6 = 0.167 or 16.7%

15. (c) 3 ÷ 4 = 0.75  
    0.75 + 3 = 3.75
16. (c) \[256 - 58 = 198\]
    \[198 + 256 = 0.773 = 77.3\%\]

17. (c) \[37,500 \div 250,000 = 0.15 = 15\%\]

18. (b) \[1 \div 4 = 0.25\]
    \[3 + 16 = 0.1875\]
    \[1 \div 8 = 0.125\]
    \[64,000 \times 0.25 = 16,000\]
    \[64,000 \times 0.1875 = 12,000\]
    \[64,000 - 16,000 - 12,000 = 36,000\]
    \[36,000 \times 0.125 = 4,500\]
    \[36,000 - 4,500 = 31,500\] square feet

19. (d) \[1 \div 4 = 0.25\]
    \[5 \div 10 = 0.5\]
    \[0.25 + 0.5 = 0.75\]
    \[1 - 0.75 = 0.25\]
    \[112.5 \div 0.25 = 450\] acres

20. (b) \[2,000 \div 7,500 = 0.267\] or 27\%
This comprehensive and valuable study tool includes:

- Glossary of real estate math terms
- New section on closing statements, including the latest Good Faith Estimate and HUD-1 forms
- Sample closing scenario with practice problems and completed HUD-1
- Comprehensive math lessons covering everything from simple computations and calculator basics to more advanced problems involving ad valorem taxes and amortized loans
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