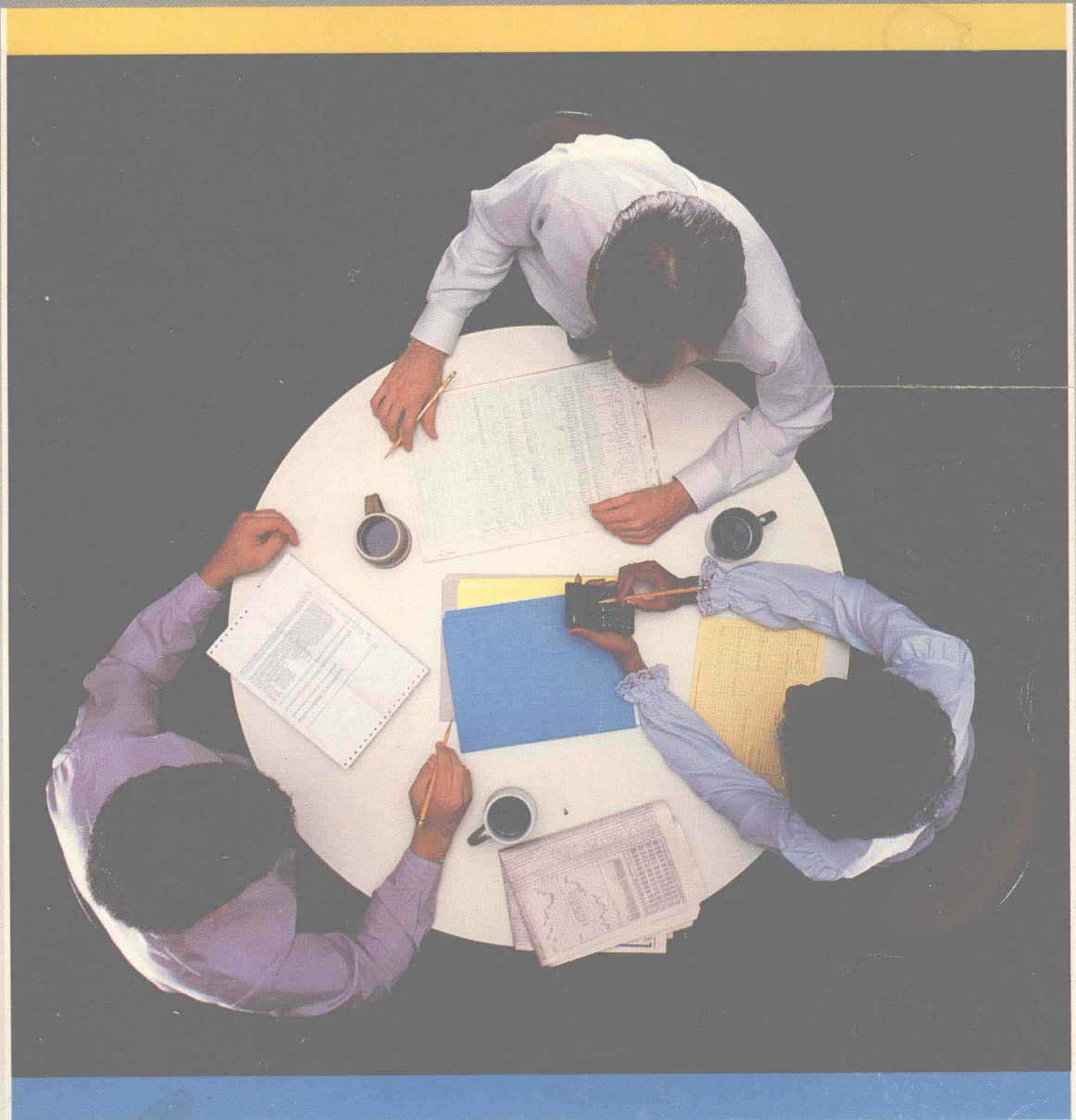

B^usiness M^athematics

Miller/Salzman

Fourth Edition



Business

Mathematics

Fourth Edition

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American River College

Scott, Foresman and Company Glenview, Illinois London, England

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Preface

This fourth edition of *Business Mathematics* has been prepared to continue the tradition of providing a complete text in those mathematical topics needed for success in business. As in earlier editions, the book provides a review of basic arithmetic, and then progresses to elementary business topics, followed by more advanced topics, such as interest, annuities, depreciation, financial statements, and business statistics. The book continues to offer solid preparation for students going on into accounting, management, retailing, marketing, or secretarial science.

Key Features

Practical Approach *Business Mathematics* takes a practical approach, showing how and where the topics are used in today's businesses. Extensive use is made of actual forms and tables, which have been updated for this edition.

Exercises Learning business mathematics requires working many exercises, so we have included almost 2500. They range from simple drill problems to word problems that require several steps to solve. More word problems than ever before are included in this book.

Supplementary Exercises Sets of supplementary exercises, designed to review difficult concepts, occur throughout the book. For example, three sets in Chapter 4 require students to distinguish among the different elements of a percent problem and decide upon the correct method of solution. A set in Chapter 8 shows how to tell simple interest from simple discount.

Examples The book offers a large number of examples that explain major points with detailed steps and explanations. The symbol ▲ makes it clear when an example ends.

Flexibility The chapters in this book are as independent as possible to give an instructor maximum freedom in setting up courses. Chapter prerequisites are as follows.

Chapter	Prerequisite	Chapter	Prerequisite
1	None	8	Percent
2	None	9	Simple interest
3	Arithmetic	10	Simple interest
4	Arithmetic	11	Percent
5	Percent	12	Percent
6	Percent	13	Percent
7	Percent	14	Percent

Learning Objectives Key learning objectives are numbered and included both at the beginning of a section and in the margin as the ideas are introduced. (See page 1 for an example of this method of emphasizing learning objectives.)

Quick Checks A brief set of Quick Check review exercises is included at the end of each section of the text. (See an example on pages 5 and 6.) Students can work the problems in the Quick Checks and then compare their answers with those given immediately following the Quick Checks. In this way, any weak points of learning can be identified quickly.

Pretests Two pretests at the beginning of the book show students the types of questions that can be expected on a pre-employment test, while another pretest measures student skills in basic mathematics. (See pages xv through xx.)

Chapter Tests Each chapter ends with a chapter test, where all the topics of the chapter can be reviewed in one place. (See an example on pages 37 and 38.)

Cumulative Review Sets These cumulative review exercise sets, located throughout the book, help students keep up on the main topics they have studied. (See, for example, pages 143 through 145.)

Glossary A glossary of key words, located at the back of the book, provides a quick summary of the main ideas of the course. (See page A-25.)

Supplements

Instructor's Edition A very useful *Instructor's Edition* provides solutions to many of the exercises, with answers to all exercises placed in the proper blanks. This gives instructors easy access to answers and step-by-step solutions. (The student version continues to give selected solutions, answers to odd-numbered exercises, and answers to all problems in the chapter tests.)

Instructor's Guide with Test Supplements and Transparency Masters An extensive *Instructor's Guide* contains suggested course outlines, teaching tips, answers to even-numbered exercises (those not in the student answer section), a test bank of test items, a diagnostic pretest, four forms of a test for each chapter, two final examinations, and transparency masters.

For the Student A complete set of **audiotapes** is available without charge to adopters of *Business Mathematics*. These tapes make the book suitable for a learning center; they also make an excellent supplement for regular classroom instruction.

Acknowledgments

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CHARLES D. MILLER
STANLEY A. SALZMAN

Introduction: Why Business Mathematics?

The need for record keeping, establishing budgets, and understanding finance, taxation, and investment opportunities continually makes mathematics become a greater part of our daily lives. The business mathematics of this text is the application of mathematics to business experience. Success in future business courses is helped with the knowledge and skills learned in business mathematics.

The need for skills in business mathematics becomes apparent for most students when they apply for their first permanent job. Many companies follow a well-organized three-part employment process: application, testing, and interview. The mathematics test often eliminates a large number of applicants from further consideration for employment. The mathematics sections of two pre-employment tests are included here. The first test contains questions from federal and state civil service examinations. The second test, for entry-level applicants, is from a major public utility examination.

The third test helps the student determine areas of strength and weakness in basic mathematics. This test contains problems in addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals, and includes percent.

Test 1 Pre-employment Test

These problems are selected from federal and state personnel board pre-employment examinations. Work each problem; then select the best answer from the five choices given.

1. Three yards most nearly equals
(a) 80 in. (b) 90 in. (c) 100 in. (d) 110 in. (e) None of these
2. $113\frac{17}{52} - 33\frac{5}{13} =$
(a) $79\frac{49}{52}$ (b) $80\frac{3}{52}$ (c) $80\frac{12}{52}$ (d) $80\frac{49}{52}$ (e) None of these
3. $221\frac{1}{19} \times 10\frac{11}{35} =$
(a) 80.3 (b) 2510.0 (c) 2510.1 (d) 2280.0 (e) None of these
4. $\frac{(418 + 56 - 8)313}{77 + (50 + 9)7 - 24} =$
(a) -12378 (b) 310 (c) 313 (d) 1246.649 (e) None of these
5. The sum of two numbers is 63, and one is 27 larger than the other. What is the smaller number?
(a) 18 (b) 26 (c) 31 (d) 45 (e) None of these
6. If upholstery material sells for \$12.76 per yard, how much would it cost to buy 144 inches of material?
(a) \$3.19 (b) \$51.04 (c) \$12.76 (d) \$25.52 (e) None of these
7. If a gallon of paint covers 340 square feet, how many gallons will be needed to cover a building 17 feet high, with two sides 60 feet long and two sides 40 feet long? (Ignore windows.)
(a) 8 (b) 5 (c) 12 (d) 10 (e) None of these
8. If a strip of cloth 36 inches long will shrink 3 inches when washed, how many inches long will a 48-inch strip be after shrinking?
(a) 44 (b) 45 (c) 46 (d) 47 (e) None of these
9. If an automobile travels 8 miles in 12 minutes, what is its average speed in mph?
(a) 40 (b) 50 (c) 60 (d) 70 (e) None of these
10. An office supply store buys 100 reams of special-quality paper for \$400. If 1 ream = 500 sheets of paper, how much must the store receive per 100 sheets to obtain a 20% gain on its cost?
(a) 83¢ (b) 85¢ (c) 96¢ (d) 98¢ (e) None of these
11. A vase is packed in a carton with a 10-inch diameter and is surrounded by packing 2 inches thick at the mouth. If the diameter of the base is $\frac{1}{2}$ the diameter of the mouth, what is the diameter of the base?
(a) 3 in. (b) 4 in. (c) 6 in. (d) 8 in. (e) None of these

12. A mechanic repairs 16 cars per 8-hour day. Another mechanic in the same shop repairs $1\frac{1}{2}$ times this number in $\frac{3}{4}$ the time. Theoretically, how many hours will it take to repair 16 cars in the shop?
 (a) $2\frac{2}{3}$ (b) $2\frac{9}{10}$ (c) 3 (d) $2\frac{1}{2}$ (e) None of these

13. An invoice contained the following items:

6 desks @ \$89.20	\$525.20
8 chairs @ \$32.50	260.00
Total	<u>\$885.20</u>

The terms given on the invoice were 3% 10 days, net 30 days. Verify the computations, which may be incorrect, and calculate the correct amount to be paid if payment is made within the discount period.

- (a) \$761.64 (b) \$771.85 (c) \$795.20 (d) \$858.64 (e) None of these
14. Full-time employees earn sick leave at the rate of 4 hours per 2-week pay period. Four work hours are equal to $\frac{1}{2}$ workday; a workweek consists of five 8-hour days, and the leave year consists of 26 biweekly pay periods. The following table gives the sick-leave record of one full-time employee for the current leave year. Determine the balance of accumulated sick leave to the credit of the employee at the end of the current leave year.

Employee	Accumulated Sick Leave from Previous Year	Sick Leave Used during Current Year
2208	8 days 4 hours	2 days 1 hour

- (a) 6 days 3 hours (b) 19 days 3 hours (c) 23 days 5 hours
 (d) 32 days 3 hours (e) None of these
15. A supply depot had an inventory of \$24,625 on January 1. During the year, purchases made by the depot amounted to \$60,000, and the cost of goods issued amounted to \$28,000. The inventory on December 31 was
 (a) \$25,065 (b) \$28,500 (c) \$49,560 (d) \$57,005 (e) None of these

Answers: 1. (d) 2. (a) 3. (d) 4. (c) 5. (a) 6. (b) 7. (d) 8. (a) 9. (a)
 10. (c) 11. (a) 12. (a) 13. (e) 14. (b) 15. (e)

Test 2 Pre-employment Test

This is a sample test provided by a public utility company. It is given to entry-level employee applicants. There are 25 problems in the test. Following each problem are five suggested answers. Work each problem in your head or on a piece of scratch paper. Then select the best answer from the five choices given.

1. Subtract:
$$\begin{array}{r} 7563 \\ -3654 \\ \hline \end{array}$$

(a) 3919 (b) 3909 (c) 4907 (d) 4919 (e) 3899
2. $\frac{3}{4} \times \frac{9}{14} =$
(a) $8\frac{3}{14}$ (b) $\frac{1}{2}$ (c) $\frac{27}{56}$ (d) $\frac{12}{16}$ (e) $\frac{27}{65}$
3. Multiply:
$$\begin{array}{r} 483 \\ \times 18 \\ \hline \end{array}$$

(a) 7694 (b) 6894 (c) 9694 (d) 8694 (e) 5218
4. Add:
$$\begin{array}{r} 9 \text{ years } 8 \text{ months} \\ 5 \text{ years } 4 \text{ months} \\ + 6 \text{ years } 9 \text{ months} \\ \hline \end{array}$$

(a) 21 years 9 months (b) 20 years 9 months (c) 22 years 2 months
(d) 20 years 8 months (e) None of these
5. Divide: $8 \overline{)6264}$
(a) 793 (b) 683 (c) 856 (d) 704 (e) 783
6. $\frac{7}{8} \div 3\frac{1}{2} =$
(a) $3\frac{1}{16}$ (b) $\frac{1}{4}$ (c) $\frac{16}{49}$ (d) 4 (e) $\frac{1}{3}$
7. $.46 \times 60 =$
(a) 27.6 (b) 2.76 (c) .276 (d) 276 (e) 24.6
8. What is the least common denominator of the fractions $\frac{1}{8}$ and $\frac{1}{36}$?
(a) 96 (b) 36 (c) 108 (d) 288 (e) None of these
9. $\frac{1}{2} + \frac{5}{8} + \frac{9}{10} =$
(a) $2\frac{1}{40}$ (b) $\frac{19}{30}$ (c) $\frac{37}{60}$ (d) $1\frac{1}{40}$ (e) $2\frac{3}{40}$
10. What is the remainder when 58,634 is divided by 8?
(a) 2 (b) 4 (c) 6 (d) 3 (e) 0
11. $\frac{7}{8} + \frac{4}{5} =$
(a) $1\frac{15}{24}$ (b) $1\frac{27}{40}$ (c) $2\frac{3}{4}$ (d) $\frac{11}{13}$ (e) None of these

12. What decimal is equivalent to $\frac{1}{2}\%$?
(a) .05 (b) .50 (c) .005 (d) .050 (e) .5
13. $619 \times 1079 =$
(a) 619,836 (b) 676,901 (c) 805,231 (d) 667,901 (e) None of these
14. 18% of 78% is
(a) 15.6% (b) 18% (c) 14.4% (d) $14\frac{1}{4}\%$ (e) None of these
15. $\frac{2}{5} \times \frac{6}{7} \times 3\frac{1}{2} =$
(a) $\frac{12}{35}$ (b) $\frac{3}{5}$ (c) $1\frac{1}{2}$ (d) $2\frac{1}{5}$ (e) $1\frac{1}{5}$
16. $.052 \times .03 =$
(a) 1.56 (b) .0156 (c) 15.6 (d) .00156 (e) 156
17. Divide: $6817 \overline{)211,327}$
(a) 310 (b) 301 (c) 3001 (d) 32 (e) 31
18. What is $\frac{1}{4}\%$ in decimal form?
(a) 2.5 (b) .25 (c) .025 (d) .0025 (e) None of these
19. $6.08 \times .0003 =$
(a) $18\frac{6}{25}$ (b) .1824 (c) 1.824 (d) .01824 (e) None of these
20. $36\frac{5}{8} \times 84 =$
(a) 3083 (b) $3076\frac{1}{2}$ (c) $3167\frac{3}{4}$ (d) $3076\frac{5}{8}$ (e) None of these
21. Change $\frac{7}{8}$ to a decimal.
(a) .875 (b) .88 (c) .9 (d) .0875 (e) None of these
22. Divide: $829 \overline{)3,773,608}$
(a) 4652 (b) 455 (c) 4502 (d) 4552 (e) 4525
23. \$7.82 from \$20 is:
(a) \$12.28 (b) \$13.18 (c) \$12.18 (d) \$12.81 (e) None of these
24. 216 square yards is how many square feet?
(a) 72 (b) 1944 (c) 24 (d) 648 (e) None of these
25. What is $\frac{1}{2}\%$ of \$1300?
(a) \$.65 (b) \$6.50 (c) \$65.00 (d) \$650 (e) \$6500

Answers: 1. (b) 2. (c) 3. (d) 4. (a) 5. (e) 6. (b) 7. (a) 8. (e) 9. (a)
 10. (a) 11. (b) 12. (c) 13. (d) 14. (e) 15. (e) 16. (d) 17. (e) 18. (d)
 19. (e) 20. (b) 21. (a) 22. (d) 23. (c) 24. (b) 25. (b)

Test 3 Pretest in Basic Mathematics

This pretest will help you determine your areas of strength and weakness in basic mathematics.

1. Round 857 to the nearest hundred. _____
2. Add: $783 + 1897 + 2 + 14 =$ _____
3. Subtract: $9210 - 699 =$ _____
4. Multiply: $5730 \times 721 =$ _____
5. Divide: $2325 \div 93 =$ _____
6. Write as an improper fraction: $9\frac{1}{8} =$ _____
7. Write in lowest terms: $\frac{135}{150} =$ _____
8. Add: $\frac{5}{8} + 2\frac{1}{4} + 3\frac{1}{6} + \frac{1}{2} =$ _____
9. Subtract: $18\frac{3}{8} - 5\frac{1}{2} =$ _____
10. Multiply: $3\frac{1}{2} \times 24\frac{1}{4} =$ _____
11. Divide: $16\frac{1}{5} \div 3\frac{1}{4} =$ _____
12. Change .375 to a common fraction. _____
13. Change $\frac{7}{8}$ to a decimal. _____
14. Add: $483.01 + 175.26 =$ _____
15. Subtract: $136.8 - 125.9 =$ _____
16. Multiply: $27.8 \times 17.3 =$ _____
17. Divide: $369.6 \div 22.4 =$ _____
18. Change $\frac{7}{8}$ to a percent. _____
19. Find 12% of 250. _____
20. 24 is 3% of _____
21. Emily Nobriga takes 425 words of shorthand in 5 minutes. How many words of shorthand can she take in 1 minute?

22. The first week that Barbara Weeks had her new car, she drove 138 miles on Monday, 65 miles on Tuesday, 78 miles on Wednesday, 106 miles on Thursday, and 183 miles on Friday. Find the total number of miles that she drove in the week.
23. A tent requires $8\frac{1}{2}$ yards of canvas for the top, $15\frac{2}{3}$ yards for the sides, $5\frac{1}{8}$ yards for the floor, and $2\frac{1}{4}$ yards for the carrying sack. Find the total canvas needed to make the tent and carrying sack.
24. Rick Parsons has just purchased an industrial building lot that measures 120.25 feet by 185.36 feet. How many feet of chain link fence will he need to go around the entire lot?
25. A package of typing paper costs \$1.19. Find the cost of 20 packages of typing paper.
26. A shipping crate weighs $2\frac{3}{4}$ pounds when empty. After being filled with avocados, it weighs $15\frac{3}{8}$ pounds. Find the weight of the avocados.
27. The cost of the Kiwanis children's party is \$248.52. If the cost of the party is to be shared evenly by the 114 members, find the cost per member.
28. Robert Armstrong donated \$828 to charity. If this amounted to 6% of his total income, find his total income.
29. The number of students applying for college scholarships this quarter is 600. How many students will receive scholarships if 23% of those who apply are selected?
30. Valerie Coffin earns \$1880 per month. If her rent amounts to \$470 per month, what percent of her total income is rent?

Answers:	1. 900	2. 2696	3. 8511	4. 4,131,330	5. 25	6. $\frac{73}{8}$	7. $\frac{9}{10}$	8. $6\frac{13}{24}$
9. $12\frac{7}{8}$	10. $84\frac{7}{8}$	11. $4\frac{64}{65}$	12. $\frac{3}{8}$	13. .875	14. 658.27	15. 10.9	16. 480.94	
17. 16.5	18. 87.5%	19. 30	20. 800	21. 85	22. 570	23. $31\frac{13}{24}$	24. 611.22	
25. \$23.80	26. $12\frac{5}{8}$	27. \$2.18	28. \$13,800	29. 138	30. 25%			

Business

Mathematics

Fourth Edition

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