BASIC ARITHMETIC REVIEW AND DRUG THERAPY

Fourth Edition

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FOURTH EDITION

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MACMILLAN PUBLISHING CO., INC.
New York

COLLIER MACMILLAN PUBLISHERS
London

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Printed in the United States of America

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Earlier editions entitled *Arithmetic Review and Drug Therapy for Practical Nurses*, by Grace E. Fitch, © 1961 and copyright © 1966 by Grace E. Fitch; *Arithmetic Review and Drug Therapy for Practical/Vocational Nurses*, by Grace E. Fitch and Margaret A. Larson, copyright © 1973 by Macmillan Publishing Co., Inc.

Macmillan Publishing Co., Inc.
866 Third Avenue, New York, New York 10022

Collier Macmillan Canada, Ltd.

ISBN 0-02-338010-1

Frontispiece courtesy of Palm Beach County Practical Nursing Program, The School Board of Palm Beach County, Florida.

Printing: 3 4 5 6 7 8 Year: 8 9 0 1 2 3

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Preface to the Fourth Edition

The aim of this manual is to present information about commonly used drugs—including dose, therapeutic action, and possible side effects—in a manner relevant to the needs of the nurse who is caring for patients with various disorders. Although written primarily for practical and vocational nurses, nursing assistants, and nursing technicians, *Basic Arithmetic Review and Drug Therapy* might well serve a parallel purpose for other allied health personnel.

This thoroughly revised fourth edition consists of seven sections, rather than the two parts comprising the previous edition. Sections I to IV encompass arithmetic review (including a pretest), measurements, calculation of drug doses, and drug administration (including instruction on self-medication of insulin). Helpful guides for self-study include a list of behavioral objectives before each of the four sections and quizzes following each chapter.

Sections V to VII deal with drugs acting on the various body systems; drugs used in the treatment of allergies, infections, and neoplastic diseases; miscellaneous therapeutic agents; and diagnostic aids. New drugs have been added to these sections, and outmoded ones deleted from the text. Two new chapters, "Drugs Acting on the Genitourinary System" and "Agents Used to Replace Body Fluids," have been included. Each chapter in Sections V to VII begins with a list of behavioral objectives, has a brief discussion of the structure and function of the body system involved, and ends with questions for study or discussion.

Several new illustrations have been added throughout the book to aid in the comprehension of drug administration. The glossary has been expanded to enhance the vocabulary of the learner. Also included in the back matter are lists of suggested references and audiovisual aids, as well as answers to odd-numbered exercises.

The booklet *Answers to Tests and Problems*, a gratis item distributed by the publisher, is available to instructors.

G.E.F.
M.A.L.
M.P.M.

Acknowledgments

The authors wish to express their gratitude to the following individuals and agencies for assistance with the many details involved in the preparation of this fourth edition:

- The faculty and the practical nursing students of the Palm Beach County Practical Nursing Program, Department of Vocational Education (Palm Beach County, Florida), made several excellent recommendations for this revision. In addition, Miss Agnes E. Darrah, R.N., Utilization Review Coordinator at Doctors Hospital (Lake Worth, Florida), and Mrs. Helen Lombard, R.N., Director of Nursing at Bethesda Memorial Hospital (Boynton Beach, Florida), helped with the selection of clinical areas for photographs involving medication administration methods.
- Mr. Paul M. Corrado, Pharmacist at Doctors Hospital (Lake Worth, Florida), as well as Mr. Marvin Moskowitz, Pharmacist, and Mrs. Helen Warner, Medical Librarian, at Bethesda Memorial Hospital (Boynton Beach, Florida), assisted with reference materials.
- Mr. Dustin Milling, photographer, spent considerable time in preparing many of the new halftone illustrations of medication administration. Also, several doctors, practical nursing instructors, students, licensed practical nurses, and emergency medical technicians contributed to this fourth edition by posing for photographs.
- Members of the staff of Macmillan Publishing Co., Inc., especially Miss Joan C. Zulch, gave generous assistance during the revision of the entire manual.

Basic Arithmetic Review and Drug Therapy

Contents

SECTION I

Arithmetic Review

EXPECTED BEHAVIORAL ACCOMPLISHMENTS

Minimum objectives have been prepared to assist you in reviewing the simple arithmetic processes that you will be using in order to safely administer drugs in their correct dosages. You should read these aims or objectives before beginning this section; this will enable you to use the objectives as a study guide. After completing this section; you should review these objectives and evaluate your ability to accomplish each of them.

1. Use the Arithmetic Pretest to determine your own strengths and weaknesses in solving simple everyday arithmetic problems.
2. Become familiar with the Arabic and Roman systems of numerals, and be able to convert from one system to the other with ease and accuracy.
3. Determine your ability to solve problems involving fractions, decimals, and per cents, and be able to change from one value to the other without error.
4. Be able to interpret ratios and know their values.
5. Evaluate your own progress by re-solving the problems of the Arithmetic Pretest, and for additional practice correctly complete the Arithmetic Review Quiz found at the end of the section.

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Arithmetic Pretest

Directions: Solve the following problems. Circle the answer you believe to be correcct. If you believe the correct answer is not given, circle NG (not given).

1. Multiply 876.4×12.

a. 951.68 **b.** 10,516.8 **c.** 1,051.68 **d.** 11,615.8 **e.** NG

2. Change 2% to a fraction.

a. $\frac{1}{2}$ **b.** $\frac{1}{5}$ **c.** $\frac{1}{10}$ **d.** $\frac{1}{50}$ **e.** NG

3. Multiply $0.2 \times 1{,}000$.

a. 2,000 **b.** 500 **c.** 20 **d.** 2 **e.** NG

4. Write the Roman numeral XXV in Arabic.

a. 15 **b.** 25 **c.** 7 **d.** 30 **e.** NG

5. Divide $5.2 \div 6.5$.

a. 0.8 **b.** 8 **c.** 0.008 **d.** 0.08 **e.** NG

6. Change $\frac{1}{5}$ to per cent.

a. 20% **b.** 5% **c.** 40% **d.** 10% **e.** NG

7. How many milliliters in 1 liter?

a. 500 **b.** 2,000 **c.** 1,000 **d.** 100 **e.** NG

8. Multiply 22.5×1.105.

a. 2.4862 **b.** 24.8625 **c.** 22.505 **d.** 2.21 **e.** NG

9. Multiply $4\frac{1}{8} \times 6\frac{1}{2}$.

a. $24\frac{1}{2}$ **b.** 32 **c.** $48\frac{1}{4}$ **d.** $26\frac{13}{16}$ **e.** NG

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10. Divide $\frac{1}{2} \div \frac{1}{8}$.

a. 2 **b.** $\frac{1}{16}$ **c.** 4 **d.** 8 **e.** NG

11. Multiply 0.008×0.06.

a. 0.00048 **b.** 48 **c.** 0.0014 **d.** 4.8000 **e.** NG

12. Change $\frac{1}{4}\%$ to ratio.

a. 1:2 **b.** 1:20 **c.** 1:5 **d.** 1:200 **e.** NG

13. What do 32 ounces equal?

a. 1 quart **b.** 1 pint **c.** 1 gallon **d.** 1 dram **e.** NG

14. Change the fraction $\frac{1}{4}$ to a decimal.

a. 0.4 **b.** 0.1 **c.** 0.25 **d.** 0.04 **e.** NG

15. Change 80% to a fraction.

a. $\frac{1}{8}$ **b.** $\frac{1}{5}$ **c.** $\frac{1}{4}$ **d.** $\frac{4}{5}$ **e.** NG

16. Divide $4{,}684 \div 0.02$.

a. 2.342 **b.** 24.32 **c.** 234.2 **d.** 1.322 **e.** NG

17. Change 5% to a decimal.

a. 0.5 **b.** 0.1 **c.** 0.2 **d.** 0.05 **e.** NG

18. Approximately how many milliliters in 8 fluidounces?

a. 100 **b.** 250 **c.** 500 **d.** 30 **e.** NG

19. Change 0.5% to a decimal.

a. 5 **b.** 0.1 **c.** 0.05 **d.** 0.005 **e.** NG

20. Divide $4.50 \div 0.5$.

a. 90 **b.** 0.09 **c.** 0.9 **d.** 8.5 **e.** NG

21. Multiply $4\frac{1}{2} \times 1\frac{1}{2}$.

a. $8\frac{1}{2}$ **b.** $5\frac{1}{2}$ **c.** $6\frac{2}{3}$ **d.** $6\frac{1}{4}$ **e.** NG

22. Multiply $8{,}407 \times 0.40$.

a. 83.67 **b.** 2,562.80 **c.** 2,652.80 **d.** 25,628 **e.** NG

23. Divide $0.2 \div 0.004$.

a. 50 **b.** 0.5 **c.** 0.005 **d.** 0.05 **e.** NG

24. Divide $\frac{7}{8} \div \frac{1}{4}$.

a. $\frac{1}{2}$ **b.** $1\frac{1}{4}$ **c.** $3\frac{1}{2}$ **d.** $3\frac{1}{8}$ **e.** NG

25. What is the approximate equivalent of 16 ounces?

a. 500 milliliters **b.** 1 liter **c.** 1 kiloliter **d.** 0.5 microliters **e.** NG

26. Divide $640 \div 0.08$.

a. 8,000 **b.** 80 **c.** 75 **d.** 7.5 **e.** NG

27. Change 4% to a decimal.

a. 0.8 **b.** 0.004 **c.** 0.4 **d.** 0.2 **e.** NG

28. Divide $6\frac{1}{2} \div 1\frac{1}{3}$.

a. $7\frac{1}{6}$ **b.** $7\frac{1}{2}$ **c.** $4\frac{7}{8}$ **d.** $5\frac{1}{2}$ **e.** NG

29. Multiply $\frac{1,500,000}{3,000,000} \times 15$.

a. 0.9 **b.** 2.5 **c.** 0.75 **d.** 0.5 **e.** NG

30. Divide $16 \div 0.8$.

a. 2 **b.** 20 **c.** 0.002 **d.** 2,000 **e.** NG

31. What is the equivalent of 1 meter?

a. 0.039 inch **b.** 1 inch **c.** 39.370 inches **d.** 36.380 inches **e.** NG

32. Multiply $\frac{40}{80} \times 16$.

a. $\frac{5}{8}$ **b.** $\frac{1}{8}$ **c.** 4 **d.** 8 **e.** NG

33. What is the approximate equivalent of 1,000 milliliters?

a. 1 gallon **b.** 1 quart **c.** $\frac{1}{2}$ gallon **d.** 1 pint **e.** NG

34. Multiply $14\frac{1}{2} \times 2\frac{1}{4}$.

a. $30\frac{1}{16}$ **b.** $13\frac{1}{16}$ **c.** $29\frac{1}{8}$ **d.** $30\frac{1}{2}$ **e.** NG

35. Divide $6 \div \frac{1}{3}$.

a. 3 **b.** $3\frac{1}{3}$ **c.** 18 **d.** 19 **e.** NG

36. At the drugstore you were sold 14 penicillin capsules for $5.60. How much did one capsule cost?

a. 30¢ **b.** 60¢ **c.** 46¢ **d.** 36¢ **e.** NG

37. In your first summer job you were paid $2.15 per hour and worked $5\frac{1}{2}$ 8-hour days per week. How much was your first pay check?

a. $86.00 **b.** $96.75 **c.** $92.60 **d.** $103.20 **e.** NG

38. What part of a 5-grain aspirin tablet would you use in order to give 2 grains?

a. $\frac{1}{5}$ **b.** $\frac{3}{5}$ **c.** $\frac{4}{5}$ **d.** $\frac{2}{5}$ **e.** NG

39. You have a cold and the doctor suggests that you increase your fluid intake to include 8 ounces of fluid every 3 hours. How much fluid would you drink at one time?

a. 1 glassful **b.** 1 pint **c.** 1 teacupful **d.** 0.5 liter **e.** NG

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40. You won a $2,000 scholarship and found you had to spend $400 for textbooks. What per cent of your scholarship did you spend for books?

a. 2% **b.** 20% **c.** 40% **d.** 5% **e.** NG

41. Which fraction is the largest?

a. $\frac{1}{2}$ **b.** $\frac{1}{8}$ **c.** $\frac{1}{3}$ **d.** $\frac{1}{4}$ **e.** $\frac{1}{6}$

42. If fresh orange juice sold for 84¢ a half gallon, how much would 1 pint cost?

a. 24¢ **b.** 42¢ **c.** 18¢ **d.** 12¢ **e.** NG

43. If your salary is $5,600 per year, what is your approximate weekly salary?

a. $120 **b.** $103.14 **c.** $107.69 **d.** $102.49 **e.** NG

44. If you were asked to take 1 ounce of a medication and did not have a measuring glass, which of the following measures would give you the approximate dose?

a. 1 teaspoonful **b.** 1 tablespoonful **c.** 3 teaspoonfuls **d.** 2 tablespoonfuls **e.** NG

45. The label on the aspirin bottle read grains 5. The doctor's prescription read aspirin grains XV every 4 hours. How many of the tablets should you take?

a. 2 **b.** 5 **c.** 4 **d.** 3 **e.** NG

46. The patient's bill was $1,300 and his insurance company paid $780. What per cent of the bill was the patient responsible for paying?

a. 60% **b.** 20% **c.** 30% **d.** 45% **e.** NG

47. The label on the bottle read 0.5 Gm. of medication and the doctor ordered 0.25 Gm. How many of the tablets in the bottle should be given?

a. 5 **b.** 2 **c.** $\frac{1}{4}$ **d.** $\frac{1}{2}$ **e.** NG

48. If you paid 75¢ for a packet of pencils and $1.25 for a packet of lined paper, what per cent of a $5.00 bill would you spend?

a. 20% **b.** 50% **c.** 15% **d.** 40% **e.** NG

49. If you earn $800 per month and your budget includes $200 for rent, $160 for food, $60 for utilities, $80 for car payments, and $100 for insurance and incidentals, what per cent of your salary would you have left for savings?

a. 25% **b.** 20% **c.** 6% **d.** 5% **e.** NG

50. How is the Roman numeral MCMLXXVII written in Arabic?

a. 1775 **b.** 1750 **c.** 1950 **d.** 1965 **e.** NG

CHAPTER 1

Roman and Arabic Numerals

In order to read and interpret prescriptions and orders written by the doctor, the bedside nurse should recall the two systems of numbers or numerals. Both systems are used in expressing dosages of drugs and, therefore, are reviewed below.

NUMBERS OR NUMERALS

Arabic System. This system uses ten arithmetic symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. All other numbers are composed of two or more of these symbols. These same symbols are used to express fractions ($\frac{1}{4}$) or decimals (0.5).

Roman System. This system uses the letters I, V, X, L, C, D, and M as symbols and combines them in definite ways to express whole numbers. The letters express amounts as follows:

I = 1	C = 100
V = 5	D = 500
X = 10	M = 1,000
L = 50	

In expressing numbers by the Roman system, certain rules must be followed:

1. Some letters may be repeated in sequence, but never more than three times. (The letters V, L, and D, of course, are never repeated, because their values when doubled are expressed by X, C, and M, respectively.) Example of letters repeated in sequence:

III = 3
XXX = 30

2. When letters representing numbers of lesser value follow letters representing larger numbers, the lesser values are added to the larger number.

EXAMPLE: VIII = 5, 1, 1, 1, or 8

3. When letters representing numbers of lesser value precede letters representing larger numbers, the lesser value is subtracted from the larger number.

EXAMPLE: IX = 10 − 1, or 9

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