DOCUMENT RESUME

ED 115 483 SE 019 748

AUTHOR Main, R. E.
TITLE The Practical Arithmetic Self-Study (PASS) Course. Book I--Directions and Auxiliary Materials.
INSTITUTION Navy Personnel Research and Development Center, San Diego, Calif.
PUB DATE Sep 73
NOTE 97p.; For Book II, see SE 019 852

EDRS PRICE MF-$0.76 HC-$4.43 Plus Postage
DESCRIPTORS Autoinstructional Aids; *Basic Skills; *Mathematics Education; Post Secondary Education; *Programed Instruction; Programed Texts; Program Guides; *Remedial Arithmetic; *Teaching Guides; Textbooks

ABSTRACT

This guidebook to a self-study course in practical mathematics contains: (1) the course description; (2) directions for testing and training; and (3) lesson progression sheets, quizzes, quiz answers, and lesson answers. The 25 quizzes cover multiplication and division of whole numbers, operations with fractions and decimals, understanding math symbols, solving equations, percent problems and applications, measurement problems, rates and average problems, and ratios and proportions. The student self-study book is bound separately as book II. (JBW)

NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER SAN DIEGO, CALIFORNIA 92152

PRACTICAL [redacted] ARITHMETIC SELF STUDY

R. E. Main

BOOK I--DIRECTIONS AND AUXILIARY MATERIALS

THE PRACTICAL ARITHMETIC SELF-STUDY (PASS) COURSE

BOOK I--DIRECTIONS AND AUXILIARY MATERIALS

R. E. Main

September 1973

Navy Personnel Research and Development Center
San Diego, California 92152

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FOREWORD

Introduction

One might expect that professionals in the field of education would be able to assess with some accuracy the relative merit of training materials. Rothkopf (5) has conducted an intriguing study which puts this notion to experimental test. Teachers and principals were asked to estimate the relative effectiveness of several different sets of training materials, each of which had been designed to cover the same content. Because achievement data had previously been gathered, comparisons of actual and predicted effectiveness could be made. In general, those materials judged most effective by educators were the ones found the least effective in terms of student achievement.

This anecdote illustrates the importance of validating the effectiveness of instructional materials in terms of student performance. The mathematical training materials presented in this manual were developed and validated on a basis of repeated tryouts with Navy students followed by diagnostic evaluations of their performance (3). Whatever worked was retained; whatever did not was discarded or modified.

These materials, under the title of The Practical Arithmetic Self-Study (PASS) Course, were developed as a by-product of research conducted by the Navy Personnel Research and Development Center (NPRDC). The research represented an effort to identify effective methods for training Navy personnel whose pre-induction test scores indicate low levels of competency in various academic skills. Such personnel typically perform poorly in Navy Class A schools.

Although designed for use with marginally-qualified personnel, the instructional materials developed in conjunction with NPRDC's research program have been found effective for students with a wide variety of backgrounds and qualifications. Experimental courses involving recipe conversion (4) and circuit-board-soldering skills (2, 6) have already been developed into training packages which have been utilized by Navy training commands.

The PASS Course materials presented in this manual are based on an experimental course developed to provide individualized remedial training in basic mathematics. Indications of interest in individualized mathematics instruction and requests by naval commands for copies of the experimental course led to the decision to publish these materials as a training package.

Course Description

This text was planned and developed by the Navy Personnel Research and Development Center. It is designed for use, in part or whole, in

Navy training programs that require some level of skill in performing basic mathematical operations. In consideration of those who wish to determine whether the content and orientation of this course are suitable to their particular needs, the following course description has been prepared.

1. Content. The course is designed to cover mathematical operations from the sixth to ninth grade level of difficulty. Course content is based on the Arithmetic Computation portion of the USAFI Achievement Test III. Types of mathematical operations include: calculations with whole numbers, fractions, decimals, and percentages; computations that involve units of measure (e.g., time, rate of speed, length, area, volume); solutions that involve formulas, linear equations in one unknown, ratios, and averages. Addition and subtraction of whole numbers are not covered, partly because very few Navy personnel appeared to find these types of problems difficult, and partly because an excellent Navy text is already available which covers these operations (1).

2. Administration. The course is designed for self-study with minimal assistance. However, the presence of an instructor for providing direction, encouragement, and evaluation is believed to be beneficial. Trainees need cover only those types of mathematical operations that are difficult for them. Course work is sectioned into a series of lessons, each of which may be worked as a unit. For each lesson there is a corresponding diagnostic quiz provided. Complete instructions for administering course work can be found in Section I, Part B of the manual.

3. Orientation. The course was developed in order to provide remedial training to Navy enlisted personnel. With this goal in mind, efforts were made to relate computational processes to practical applications which would be relevant to a Navy man's experiences. Course work is performance oriented. Unnecessary theory and jargon are eliminated wherever possible. Terms such as "numerator" or "subtrahend" are replaced by expressions which are commonly used in everyday life. Explanations are brief, simply worded, and typically illustrated with examples. Content is organized from the student's point of view and extensive use of underlined headings is made to clarify content organization and to simplify location of particular processes. Written responses are frequently required of the student in order to maintain involvement and to provide immediate application of training.

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THE PRACTICAL ARITHMETIC SELF-STUDY (PASS) COURSE

I. Directions

A. Testing

If achievement testing is desired, the Arithmetic Computation portion of the U. S. Armed Forces Institute (USAFI) Achievement Tests III[1] provides a relevant standardized criterion with raw scores that can be directly converted into school grade levels. The PASS Course content was designed specifically to cover the level and orientation of the items contained in this USAFI test.

B. Training

1. Overview. In Figure 1 an illustrated flow chart is displayed to indicate how course materials are to be presented. The student progresses through a series of course lessons, alternating between quizzes and course work. He begins by taking a lesson quiz to determine which operations he needs to study. He is then directed to the sections of the lesson where examples of the items he missed are covered. He studies the specified portions of the lesson, making written responses where required. Upon completion of the indicated course work, he checks his written response against an answer key and corrects any errors, reviewing explanations and examples when necessary. When he has completed the required course work and is satisfied that he understands how to work the problems, the student reworks the quiz items he missed. This process is then repeated until all quiz items have been answered correctly. When all answers are correct, the student goes on to the next lesson quiz.

2. Administering Diagnostic Quizzes. The PASS Course consists of 25 lessons and, for each lesson, there is a corresponding quiz. Course quizzes are located in Part B of the Auxiliary Materials section. Each quiz is coded with a letter identification representing the type of mathematical operations being covered (A-Multiplication, B-Division, etc.). The quizzes are ordered alphabetically. Some types of operations have been subdivided into several lessons, each with a separate quiz. Hence, under C-Fractions are lessons C-I, C-II, C-III, and C-IV, each to be worked as a unit.

The first administration of the quiz is given before the student starts a lesson. The instructor corrects the results and indicates which items were missed but does not specify the correct answer. (Quiz answers are presented in Part C of the Auxiliary Materials section.) If

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[1] Test forms and instructions may be obtained through the U. S. Armed Forces Institute, Madison, Wisconsin 53713.

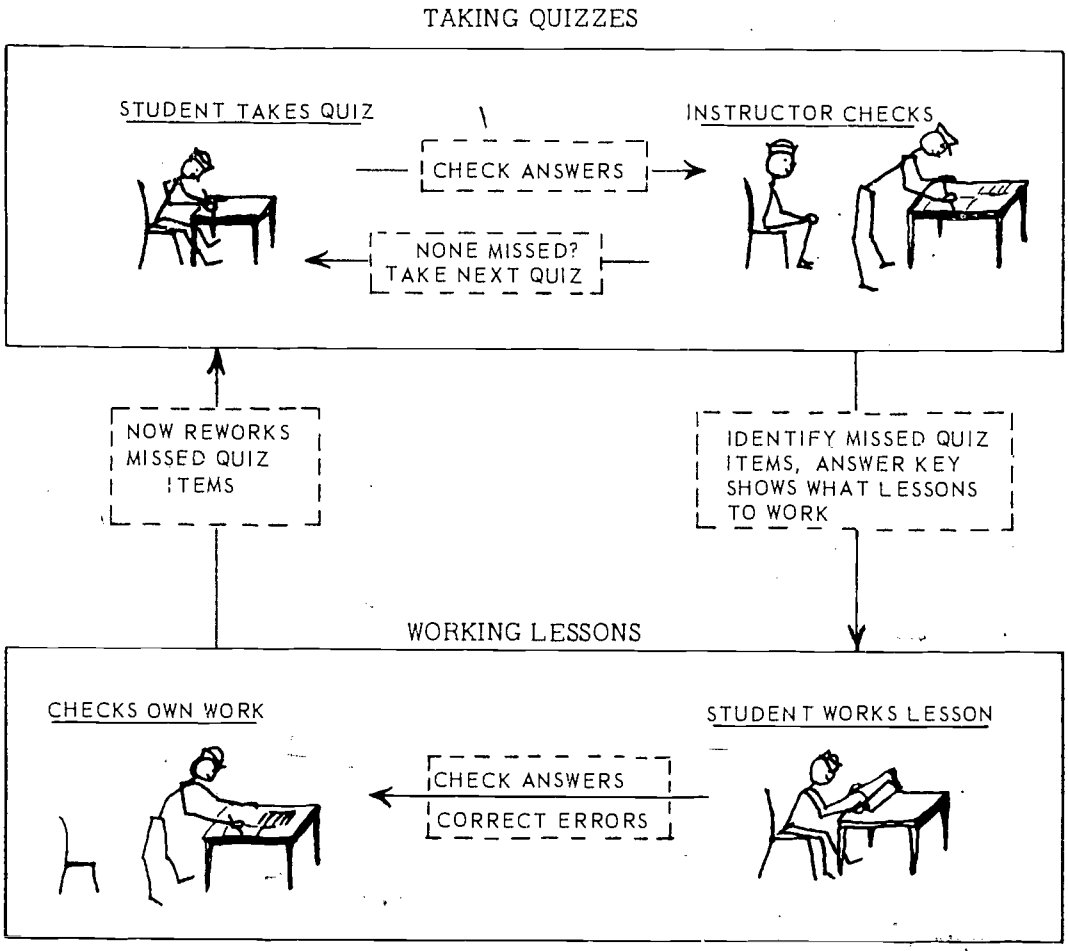

Fig. 1. Recommended Sequence of Operations in Administering PASS Course Materials.

no items are missed, the student skips that lesson and goes on to the next quiz. If errors were made, the student is directed to appropriate portions of the lesson. After completing the required course work, the student reworks the quiz items that he missed. The entire process is repeated until all items are correct.

3. Assigning Course Work. Exactly which lessons should be administered to the student will depend upon the goals and requirements of the individual training activity. Whatever course work is covered, the order in which it is presented should be carefully considered. A suggested ordering of lesson presentation is displayed in Part A of the Auxiliary Materials section. While alternate orderings may be equally effective, care must be taken to be certain the student has the necessary background knowledge before he starts any given lesson.

Once the student has taken a lesson quiz, he should be assigned to corresponding course work. The parts of the lesson he covers will depend on the quiz items he misses. The quiz answer key, located in Part C of the Auxiliary Materials section, not only provides the correct answers to the quiz problems but also indicates which parts of the course work the student should cover before repeating the lesson quiz. While it is possible for students to correct their own quiz answers and direct themselves to appropriate course work, it was found that having the instructor carry out these functions reduced cheating and increased student motivation.

4. Administering Course Work. Course lessons are separately located in Book II. Lessons are coded alphabetically and ordered according to their letter designations. Course work is designed for individual study so that each student may work at his own pace. It may be expected that the rate of progress will vary considerably from student to student. Following completion of a lesson the student may check the accuracy of his responses to the numbered questions presented in the lesson. Answers to numbered questions in the lessons are provided in Part D of the Auxiliary Materials section.

In general, it is probably better for the student to learn to work on his own as much as possible. However, the instructor should carefully monitor the student's progress. From time to time, it may be necessary to give encouragement, direct attention to a particular portion of instruction, or clarify an explanation that has been misunderstood. Students should be discouraged from proceeding through the lesson so quickly that they have to repeat course work several times.

Once the student has completed the parts of a lesson to which he has been assigned, he should check his written responses. Answers to numbered lesson questions are located in Part E of the Auxiliary Materials section. If he finds he has made errors he should review the portions of the course work that gave him trouble and correct his wrong answers. At this point, the student is ready to go back to the lesson quiz and rework the items he missed.

II. Auxiliary Materials

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A. Lesson Progression Sheet

The following is a recommended lesson sequence for the student to follow in progressing through the course.

Ordering of Courses

E	C-V
A	G-II
B-I	H-I
B-II	F-I
B-III	H-II
C-I	F-II
D-I	H-III
C-II	J-I
D-II	G-IV
C-III	H-IV
G-I	J-II
C-IV	H-V
G-III	

(REVERSE SIDE BLANK)

QUIZ A

MULTIPLICATION

(1) 325 x 8 = ? answer _____

(2) 462 x 3 = ? answer _____

(3) 903 x 5 = ? answer _____

(4) 123
x 507 answer _____

(5) 987
x 81 answer _____

(6) 803
x 67 answer _____

(7) 2006
x 305 answer _____

(8) 4000 x 2000 = ? answer _____

(REVERSE SIDE BLANK)

QUIZ B-I

SHORT DIVISION

(1) $25 \div 5 =$? answer _____

(2) $49 \div 7 =$? answer _____

(3) $56 \div 8 =$? answer _____

Give these answers with remainders. (For example: 10 r3)

(4) $7 \div 2 =$? answer _____

(5) $50 \div 8 =$? answer _____

Give these answers with remainders as fractions. (For example: 5 1/7)

(6) $5 \div 3 =$? answer _____

(7) $13 \div 5 =$? answer _____

(8) $53 \div 6 =$? answer _____

(REVERSE SIDE BLANK)

QUIZ B-II

LONG DIVISION

Give all remainders in the (r) form. (For example: 63 r2)

(9) 125 ÷ 5 = ? answer _____

(10) 543 ÷ 3 = ? answer _____

(11) 207 ÷ 5 = ? answer _____

(12) 412 ÷ 4 = ? answer _____

(13) 64,264 ÷ 8 = ? answer _____

(14) 360,000 ÷ 6 = ? answer _____

(REVERSE SIDE BLANK)

QUIZ B-III

DIVISION BY LARGE NUMBERS

Give all remainders in the (r) form. (For example: 25 r3)

(15) 144 ÷ 12 = ? answer _____

(16) 8904 ÷ 21 = ? answer _____

(17) 7650 ÷ 25 = ? answer _____

(18) 2160 ÷ 45 = ? answer _____.

(19) 625 ÷ 125 = ? answer _____

(20) 26,259 ÷ 42 = ? answer _____

(21) 30,044 ÷ 74 = ? answer _____

(REVERSE SIDE BLANK)

QUIZ C-I

BASIC FRACTIONS

Add, subtract, multiply, or divide these fractions as indicated.
(Do not simplify your answer)

(1) 1/3 of 5 = ? answer _____

(2) 3/4 of 7 = ? answer _____

(3) 1/8 + 3/8 = ? answer _____

(4) 1/8 ÷ 1/3 = ? answer _____

(5) 1/2 x 3/4 = ? answer _____

(6) 5/6 - 2/6 = ? answer _____

(7) 2/3 ÷ 5 = ? answer _____

(8) 2/6 x 1/6 = ? answer _____

(9) 5/7 ÷ 2/7 = ? answer _____

(10) 4 ÷ 3/5 = ? answer _____

(11) 1/5 + 1/5 = ? answer _____

(12) 1/3 x 1/3 = ? answer _____

(13) 2/3 ÷ 2/3 = ? answer _____

(14) 5/8 - 3/8 = ? answer _____

(15) 3/8 ÷ 5 = ? answer _____

(REVERSE SIDE BLANK)

QUIZ C-II

MIXED NUMBERS

Change the following mixed numbers into fractions. (Example: 1 2/5 = 7/5)

(16) 2 1/2 = ? answer _____

(17) 1 1/7 = ? answer _____

(18) 3 2/5 = ? answer _____

Work the following problems. (Do not simplify answers)

(19) 2 1/3 x 1 1/2 = ? answer _____

(20) 4 1/5 + 2 1/5 = ? answer _____

(21) 7 5/8 - 2 4/8 = ? answer _____

(22) 1 1/2 ÷ 1 2/3 = ? answer _____

(23) 3 1/3 - 2/3 = ? answer _____

(24) 6 2/5 - 1 4/5 = ? answer _____

(25) 2 1/8
x 2/3

_____ answer

(26) 3 1/3
x 2 4/5

_____ answer

17

21/22

(REVERSE SIDE BLANK)

QUIZ C-III

SIMPLIFYING ANSWERS

Reduce these fractions to lowest terms: 10/4 = 2 1/2

(27) 5/2 = ? answer _____

(28) 4/6 = ? answer _____

(29) 10/8 = ? answer _____

(30) 1 5/4 = ? answer _____

(31) 3 9/4 = ? answer _____

(32) 23/41 = ? answer _____

(33) 7 14/6 = ? answer _____

(34) 12/42 = ? answer _____

(REVERSE SIDE BLANK)

QUIZ C-IV

EQUIVALENT FRACTION PROBLEMS

Change these fractions to equivalent fractions.

(35) 2/3 = ? /12 answer _____

(36) 3/7 = ? /28 answer _____

(37) 6/5 = ? /30 answer _____

Find the answer to each of the following problems. (Simplify answers)

(38) 2/3 + 4/9 = ? answer _____

(39) 3/5 - 2/15 = ? answer _____

(40) 1 1/21 + 2 6/7 = ? answer _____

(41) 3 2/3 - 2 5/12 = ? answer _____

(42) 1/2 - 1/3 = ? answer _____

(43) 2/5 + 2/3 = ? answer _____

(44) 6 5/7 - 4 2/5 = ? answer _____

(REVERSE SIDE BLANK)

QUIZ C-V

COMPLEX FRACTION PROBLEMS

Work each of the following problems. (Simplify answers)

(45) $2\ 3/5 + 1\ 2/3 + 5/6$

answer _____

(46) $3\ 1/8 - 1\ 1/4$

answer _____

(47) $1\ 3/5 \times 2\ 1/2 \times 5/6 = ?$

answer _____

(48) $5\ 2/3 + 7\ 5/6 + 4\ 1/4 = ?$

answer _____

(49) $1\ 5/8 - 5/6 = ?$

answer _____

(50) $10\ 4/5 - 2\ 7/8 = ?$

answer _____

(51) $1\ 3/7 \times 2\ 1/2 \times 3\ 1/2 = ?$

answer _____

First simplify, then work each problem. (Simplify answers)

(52) $\frac{27}{10} \times \frac{100}{99} \times \frac{35}{70} = ?$

$\frac{\quad}{1} \times \frac{\quad}{11} \times \frac{\quad}{2} = \quad$

(53) $\frac{54}{77} \div \frac{9}{11} = ?$

$\frac{\quad}{7} \times \frac{\quad}{1} = \quad$

27/28
20

(REVERSE SIDE BLANK)

QUIZ D-I

DECIMAL ADDITION, SUBTRACTION AND MULTIPLICATION

Work the following problems.

(1) 2.5 + 6.1 = ? answer _____

(2) 52.3 - 5.7 = ? answer _____

(3) 10 x .5 = ? answer _____

(4) 6.72 + 33.5 = ? answer _____

(5) 1.2 x 3 = ? answer _____

(6) 1.1 x 2.2 = ? answer _____

(7) .3 x .3 = ? answer _____

(8) 3.2 + 12 + .41 = ? answer _____

(9) 485.1 - .872 = ? answer _____

(10) .10 x 3.20 = ? answer _____

(11) 41.3 x .02 = ? answer _____

(12) .03 x .04 = ? answer _____

(13) .05 x .02 = ? answer _____

(REVERSE SIDE BLANK)

QUIZ D-II

DECIMAL DIVISION

Work the following problems.

(14) $6\overline{)37.2}$ = ? answer _____

(15) $8\overline{)4.0}$ = ? answer _____

Work these problems. Add on decimal points and zeros to eliminate remainders.

(16) $6\overline{)39}$ = ? answer _____

(17) $2\overline{)481}$ = ? answer _____

(18) $5\overline{)27.6}$ = ? answer _____

(19) $4\overline{)17.3}$ = ? answer _____

(20) 4/5 = ? answer _____

(21) 1/4 = ? answer _____

(22) 9/2 = ? answer _____

(23) 5/4 = ? answer _____

Work these division problems.

(24) $.2\overline{)54}$ = ? answer _____

(25) $1.2\overline{)1.44}$ = ? answer _____

(26) $.05\overline{)2.5}$ = ? answer _____

(REVERSE SIDE BLANK)

QUIZ E

UNDERSTANDING MATH SYMBOLS

For problems E-1 through E-8 write out what the symbols mean in words.
For example: 2 x 3 means 2 times 3

$2\overline{)4}$ means 4 divided by 2

(1) 5/2 means 5 _____ ___ 2

(2) (6)(9) means 6 _____ 9

(3) 9 ÷ 3 means _____

(4) $\frac{6}{2}$ means _____

(5) 1/3 of 12 means _____

(6) 5^2 means _____

(7) 1/4 means _____

(8) 6% of 10 means _____

Work these problems.

(9) $\sqrt{9}$ = ? answer _____

(10) 8^2 = ? answer _____

(11) 8/2 = $\sqrt{\quad}$ = ? answer _____

(12) 10 ÷ 5 = $\sqrt{\quad}$ = ? answer _____

(REVERSE SIDE BLANK)

QUIZ F-I

FORMULAS

Plug in numbers in place of letters and solve. (Give parts of whole numbers as fractions)

	If	And	Then
(1)	$n = b + 3$	$b = 2$	$n =$ _____
(2)	$n = 2d$	$d = 3$	$n =$ _____
(3)	$a = \frac{7}{b}$	$b = 9$	$a =$ _____
(4)	$k = 8 - y$	$y = 5$	$k =$ _____
(5)	$n = y^2$	$y = 3$	$n =$ _____
(6)	$c = 2d^2$	$d = 4$	$c =$ _____
(7)	$d = 4c^2$	$c = 3$	$d =$ _____
(8)	$n = y + z$	$y = 3$ $z = 4$	$n =$ _____
(9)	$k = \frac{5n}{d}$	$n = 6$ $d = 15$	$k =$ _____
(10)	$A = bc^2$	$b = 3$ $c = 2$	$A =$ _____
(11)	$N = 4yk$	$y = 4$ $k = 3$	$N =$ _____

35/36
24

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QUIZ F-II

EQUATIONS

Solve the following equations. (Give parts of whole numbers as fractions)

	If	Then
(12)	$a + 2 = 5$	$a =$ _____
(13)	$x - 3 = 7$	$x =$ _____
(14)	$\frac{y}{2} = 6$	$y =$ _____
(15)	$k \times 7 = 21$	$k =$ _____
(16)	$6 \times n = 5$	$n =$ _____
(17)	$7 + b = 10$	$b =$ _____
(18)	$4 = \frac{c}{10}$	$c =$ _____
(19)	$8 - n = 1$	$n =$ _____
(20)	$\frac{12}{n} = 4$	$n =$ _____
(21)	$9 = d \times 11$	$d =$ _____
(22)	$7 = n - 16$	$n =$ _____
(23)	$32 = 27 + x$	$x =$ _____
(24)	$\frac{n}{9} = 45$	$n =$ _____

(REVERSE SIDE BLANK)

QUIZ G-I

PERCENTS OF NUMBERS

Change each of these percents into a fraction. (Don't reduce)

(1) 12% = ? answer _____

(2) 5% = ? answer _____

(3) 80% = ? answer _____

Change each of these percents into a decimal.

(4) 18% = ? answer _____

(5) 25% = ? answer _____

(6) 3% = ? answer _____

(7) 40% = ? answer _____

(8) 600% = ? answer _____

Work these problems

(9) 20% of 50 = ? answer _____

(10) 6% of 80 = ? answer _____

(11) 18% of 200 = ? answer _____

(12) 200% of 4 = ? answer _____

(13) 2% of $55 = ? answer _____

(14) 60% of $40 = ? answer _____

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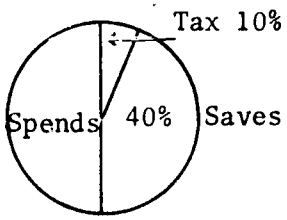
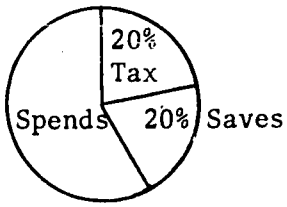
QUIZ G-II

ADDING AND SUBTRACTING PERCENTS

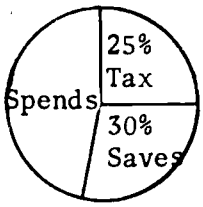
A.



B.



C.



(15) What percent does A. spend? answer _____

(16) What percent does B. spend? answer _____

(17) What percent does C. spend? answer _____

(18) If A. earns a total of $100, how much does he save? answer _____

(19) If B. earns a total of $400, how much is his tax? answer _____

(20) If C. earns a total of $1000, how much does he spend? answer _____

(21) If C. earns a total of $200, how much is his tax and savings added together? answer _____

(REVERSE SIDE BLANK)

QUIZ G-III

PERCENTAGE PROBLEMS

(22) If there is a 5% sales tax, how much tax would you pay on $50? _____

(23) If the rate of interest is 7% per year, what would you pay in interest if you borrow $200 for a year? _____

(24) If the rate of interest is 6% per year, what would you pay in interest to borrow $100 for 3 years? _____

(25) If the rate of interest is 1% per month, what would you pay in interest to borrow $200 for 1 year? _____

(26) If a store sells goods for 20% more than it paid for them, what would it cost you to buy a $30 watch? _____

(27) If a salesman gets to keep 15% of what he sells, how much would he keep if he sells $600 worth of goods? _____

(28) If an $80 coat has been discounted 25%, what does it cost? _____

(29) If a $1,000 car is marked down 15%, what do you save? _____

(30) Principle = $500
Rate = 12%
Time = 2 years
Interest = $_____

(31) Selling Price = $3500
Rate of Commission = 8%
Commission = $_____

(REVERSE SIDE BLANK)

QUIZ G-IV

PERCENTAGE EQUATIONS

Solve these percentage equations.

(32) If: 40% of n = 50 n = _____

(33) If: n% of 100 = 30 n% = _____

(34) If: 30% of 40 = n n = _____

(35) If: 25% of n = 15 n = _____

(36) If: n% of 32 = 8 n% = _____

(37) If you spend $40 at a night club and a $2 tax is added, what percentage do you pay in tax?

answer _____

(38) If you pay a 15% income tax, how much would you have to earn to pay $600 in tax?

answer _____

(39) Cost = $4,100

Commission = $328

Rate of Commission = _____

(40) Interest = $20

Rate = 5%

Principal = _____

(41) What percent of 128 = 32? answer _____

(42) 4.5 is 5% of ? answer _____

(REVERSE SIDE BLANK)

QUIZ H-I

MEASURING DIMENSIONS

Give the correct units (ft., sq. yds., cu. in., etc.) with each answer.

(1) If you have a room 20 feet long and 40 feet wide, what would be the area of the room?

answer _____

(2) A ship's hold is 60 feet long, 30 feet wide, and 20 feet deep. If the space were flooded it would hold ? cubic feet of water.

answer _____

(3) In order to rope off a space that is 9 yards long and 5 yards wide you would need a rope that was ? yards long.

answer _____

(4) How many feet of fencing will it take to fence off a stowage area that is 100 feet by 50 feet?

answer _____

(5) If you are counting a stack of crates that are lined up in 5 rows with 8 crates in each row on the bottom, how many crates will there be in all if they are stacked 4 crates high?

answer _____

(6) A space aboard ship has a floor area 8 ft. by 6 1/2 ft. How many square feet of rubber matting will it take to cover the floor?

answer _____

(7) Volume = 2 1/4" by 5" by 1 3/5" = ? cubic inches?

answer _____

(REVERSE SIDE BLANK)

QUIZ H-II

RATES AND AVERAGES

(8) How fast would you have to go to travel 420 miles in 7 hours?

answer _____

(9) A man painting can cover 320 square feet of deck in 40 minutes. We would say that his rate of work is ? sq. ft. per minute.

answer _____

(10) If a ship travels 48 miles in 6 hours its rate of speed would be ? miles per hour.

answer _____

(11) A radioman can receive 160 words of code in 4 minutes. His rate is ? words per minute.

answer _____

(12) Time = 6 hr.

Distance = 540 miles

Rate = ? miles per hour answer _____

(13) What is the average of: 8, 12, 10, and 2? answer _____

(14) On a test, five different students made the following number of errors: 6, 5, 3, 2 and 4. What was the average number of errors?

answer _____

(15) The average of 2 and 10 = ? answer _____

(16) The crew sizes of four different ships are: 175, 225, 200, 200. What is the average crew size.

answer _____

(REVERSE SIDE BLANK)

QUIZ H-III

UNIT CONVERSION

(17) If: 1 ft. = 12 in.

Then: 5 ft. = ? answer _____

(18) If: 3 ft. = 1 yd.

Then: 21 ft. = ? yd. answer _____

(19) If: 1 hr. = 60 min.

Then: 120 min. = ? hr. answer _____

(20) If a man works 3 hrs. 30 min. in the morning, and 4 hr. 45 min. in the afternoon, his total work time for the day is:

8 hr. ? min. answer _____

(21) If a board is 6 ft. 2 in. long and we cut off 1 ft. 8 in., then how long a piece do we have left? (Give your answer in feet and inches)

answer _____

(22) If a man leaves home at 7:45 and gets to work at 8:30 then it takes him ? minutes to get to work.

answer _____

(23) If a seaman starts chipping paint at 0815 and finishes at 1145 then how long does he work? (Give your answer in hours and fractions of hours)

answer _____

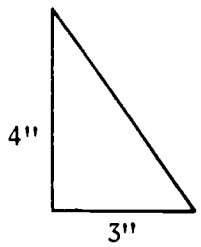
(REVERSE SIDE BLANK)

QUIZ H-IV

MEASUREMENT FORMULAS

Triangles

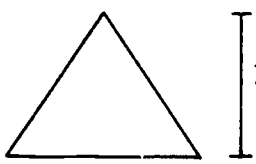
(24) The triangle below is half of a 4" by 3" square. What is the area?



answer_____

(25) The area of the triangle shown below can be found with the formula:

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

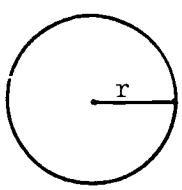


What is the area? answer_____

Circles

(26) The formula for finding the area of a circle is: $A = \pi r^2$ where:

A = area π = 3.14 r = radius (distance from the center to the edge)



If: r = 10 in. Then: A = ? sq. in.

answer_____

(27) If the area of the end of a piece of pipe is 6 sq. in. and the pipe is 10 1/3 in. long, then the volume of the pipe is ____?____ cu. in.

answer_____

(REVERSE SIDE BLANK)

QUIZ H-V

CONVERSION OF SQUARE UNITS AND CUBIC UNITS

(28) One square yard = ? square feet.

answer _____

(29) There are ? cubic feet in 1 cubic yard.

answer _____

(30) 144 square inches are equal to ? square feet.

answer _____

(31) 54 cubic feet are equal to ? cubic yards.

answer _____

(32) 2 1/3 square yards = ? square feet.

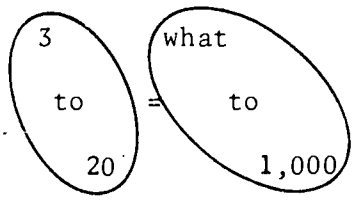
answer _____

(REVERSE SIDE BLANK)

QUIZ J-I

SOLVING RATIOS

(1) If 3 out of 20 missiles are defective, then how many missiles out of 1,000 will be defective?



$$\frac{3}{20} = \frac{n}{1{,}000}$$

answer _____

(2) If it costs you $6 to borrow $50, how much will it cost to borrow $325?

6 what

to = to

50 325

answer _____

(3) If it takes you 3 months to save $20, how many months will it take to save $500.

3 what

to = to

20 500

answer _____

(4) If you can go 330 miles in 5 1/2 hours, how far could you go in 3 hours?

330 what

to = to

5 1/2 3

answer _____

(5) It takes 2 3/8 pounds of beets to feed 10 men. How many pounds will be needed to feed a crew of 80 men?

2 3/8 what

to = to

10 80

answer _____

(6) If, on a map, 3 inches = 1,000 miles then a distance of 2 1/4 inches =

1000 what

to = to

3 2 1/4

answer _____

(REVERSE SIDE BLANK)

QUIZ J-II

SETTING UP RATIO EQUATIONS

(7) A map is drawn to a scale of 3 inches = 50 miles. If two cities are 12 inches apart on the map, how many miles apart are they?

answer _____

(8) If land is taxed by the acre and a man pays $60 tax on 8 acres of land, how much would he pay on 12 acres?

answer _____

(9) How many miles will your car go on 6 gallons of gas if it goes 164 miles on 8 gallons?

answer _____

(10) If you can make 7 out of 8 baskets when playing basketball, how many baskets will you make if you shoot 48 times?

answer _____

(11) If the tax rate on property is $2.50 per $100 and the assessed valuation of the property is $4,000, what is the tax?

answer _____

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ A: MULTIPLICATION

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	2600	A-1 to A-4	
(2)	1386	"	
(3)	4515	A-3	A-1 to A-2, A-4
(4)	62,361	A-7 to A-9	A-1 to A-6
(5)	79,947	A-5 to A-6	A-1 to A-4
(6)	53,801	A-3 to A-6	A-1 to A-2
(7)	611,830	A-3, A-7 to A-9	A-1 to A-2 A-4 to A-6
(8)	8,000,000	A-11	A-1 to A-10

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ B-I: SHORT DIVISION

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	5	B-1 to B-2 B-5 to B-6	
(2)	7	"	
(3)	7	"	
(4)	3 r1	B-3 to B-4	B-1 to B-2 B-5 to B-6
(5)	6 r2	"	"
(6)	1 2/3	B-7	B-1 to B-2 B-5 to B-6
(7)	2 3/5	"	"
(8)	8 5/6	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ B-II: LONG DIVISION

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(9)	25	B-9 to B-11 B-14 to B-16	
(10)	181	"	
(11)	41 r2	"	B-3 to B-6
(12)	103	B-12 to B-13	B-9 to B-11 B-14 to B-16
(13)	8033	"	"
(14)	60,000	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ B-III: DIVISION BY LARGE NUMBERS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(15)	12	B-17 to B-24	
(16)	424	"	
(17)	306	"	B-12 to B-13
(18)	48	"	
(19)	5	B-25	B-17 to B-24
(20)	625 r9	B-20	B-17 to B-24
(21)	406	B-17 to B-24	B-12 to B-13

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ C-I: BASIC FRACTIONS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	5/3	C-4	C-1 to C-3
(2)	21/4	"	"
(3)	4/8	C-11 to C-12	C-1
(4)	3/8	C-6 to C-8	C-1 to C-5
(5)	3/8	C-5	C-1 to C-4
(6)	3/6	C-11 to C-12	C-1
(7)	2/15	C-6 to C-8	C-1 to C-5
(8)	2/36	C-5	C-1 to C-4
(9)	35/14	C-6 to C-8	C-1 to C-5
(10)	20/3	"	"
(11)	2/5	C-11 to C-12	C-1
(12)	1/9	C-5	C-1 to C-4
(13)	6/6	C-6 to C-8	C-1 to C-5
(14)	2/8	C-11 to C-12	C-1
(15)	3/40	C-6 to C-8	C-1 to C-5

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ C-II: MIXED NUMBERS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(16)	5/2	C-13 to C-17	
(17)	8/7	"	
(18)	17/5	"	
(19)	21/6	C-17 to C-18	C-1 to C-5 C-15 to C-16
(20)	6 2/5	C-18	C-11 to C-17
(21)	5 1/8	"	"
(22)	9/10	C-17 to C-18	C-1 to C-8
(23)	2 2/3	"	"
(24)	4 3/5	"	"
(25)	34/24	C-19 to C-21	C-11 to C-18
(26)	140/15	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ C-III: SIMPLIFYING ANSWERS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(27)	2 1/2	C-23 to C-24	B-5 to B-7
(28)	2/3	C-25 to C-26	B-1 to B-2 C-21 to C-24
(29)	1 1/4	"	"
(30)	2 1/4	C-24	B-5 to B-7; C-23
(31)	5 1/4	"	"
(32)	23/41	C-25 to C-26	C-23 to C-24
(33)	9 1/3	C-24	B-5 to B-7; C-23; C-25 to C-26
(34)	2/7	C-25 to C-26	B-1 to B-2 C-23 to C-24

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ C-IV: EQUIVALENT FRACTION PROBLEMS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(35)	8/12	C-30 to C-33	C-27 to C-29
(36)	12/28	"	"
(37)	36/30	"	"
(38)	1 1/9	C-34	C-27 to C-33
(39)	7/15	"	"
(40)	3 14/21	C-34 C-37 to C-38	C-27 to C-33
(41)	1 1/4	"	"
(42)	1/6	C-35 to C-36	C-27 to C-34
(43)	1 1/15	"	"
(44)	2 11/35	C-35 to C-38	

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ C-V: COMPLEX FRACTION PROBLEMS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(45)	5 1/10	C-40 to C-43	C-19 to C-20 C-37 to C-38
(46)	1 7/8	C-39	"
(47)	3 1/3	C-40 to C-42	C-13 to C-17 C-43 to C-44
(48)	17 3/4	C-40 to C-43	C-37 to C-38
(49)	19/24	C-39	C-19 to C-20 C-37 to C-38
(50)	7 37/40	"	"
(51)	12 1/2	C-40 to C-42	C-13 to C-17 C-43 to C-44
(52)	1 4/11	C-43 to C-44	C-13 to C-17
(53)	6/7	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ D-I: DECIMAL ADDITION, SUBTRACTION AND MULTIPLICATION

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	8.6	D-2 to D-5	D-1
(2)	46.6	"	"
(3)	5.0	D-6 to D-7	"
(4)	40.22	D-2 to D-5	"
(5)	3.6	D-6 to D-7	"
(6)	2.42	"	"
(7)	.09	"	"
(8)	15.61	D-2 to D-5	"
(9)	484.228	"	"
(10)	.3200	D-6 to D-7	"
(11)	.826	"	"
(12)	.0012	"	"
(13)	.0010	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ D-II: DECIMAL DIVISION

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(14)	6.2	D-9 to D-10	B-9 to B-16
(15)	.5	"	"
(16)	6.5	D-11 to D-13	B-9 to B-16 D-9 to D-11
(17)	240.5	"	"
(18)	5.52	"	"
(19)	4.325	"	"
(20)	.80	D-14 to D-15	B-9 to B-16 D-9 to D-13 E-1 to E-3
(21)	.25	"	"
(22)	4.5	"	"
(23)	1.25	"	"

QUIZ ANSWERS

QUIZ D-II: DECIMAL DIVISION (Cont.)

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(24)	270	D-17 to D-20	B-9 to B-16 D-9 to D-13
(25)	1.2	"	"
(26)	50	"	"

QUIZ ANSWERS

QUIZ E: UNDERSTANDING MATH SYMBOLS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	5 divided by 2	E-1 to E-2	
(2)	6 times 9	"	
(3)	9 divided by 3	"	
(4)	6 divided by 2	E-3	E-1 to E-2
(5)	1/3 times 12	E-8 to E-9	
(6)	5 times 5	E-4 to E-6	
(7)	1 divided by 4	E-3	E-1 to E-2
(8)	6% times 10	E-8 to E-9	
(9)	3	E-6 to E-7	E-4 to E-5
(10)	64	E-4 to E-6	
(11)	$2\overline{)8} = 4$		
(12)	$5\overline{)10} = 2$	E-1 to E-2	

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ F-I: FORMULAS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	5	F-1 to F-3	
(2)	6	"	
(3)	7/9	"	
(4)	3		
(5)	9	F-2 to F-3	E-4 to E-6, F-1
(6)	32	"	"
(7)	36	"	"
(8)	7	F-5 to F-7	F-1 to F-4
(9)	2	"	"
(10)	12	"	E-4 to E-6; F-1 to F-4
(11)	48	"	F-1 to F-4

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ F-II: EQUATIONS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(12)	3	F-16	F-1 to F-12 F-17 to F-18
(13)	10	"	"
(14)	12	"	E-1 to E-3; F-1 to F-7 F-13 to F-18
(15)	3	"	F-1 to F-7 F-13 to F-18
(16)	5/6	"	"
(17)	3	"	F-1 to F-7; F-9 to F-12 F-17 to F-18
(18)	40	"	E-1 to E-3; F-1 to F-7 F-13 to F-18
(19)	7	"	F-1 to F-7; F-9 to F-12 F-17 to F-18
(20)	3	"	E-1 to E-3; F-1 to F-7 F-13 to F-18
(21)	9/11	"	F-1 to F-7 F-13 to F-18
(22)	23	"	F-1 to F-7; F-9 to F-12 F-17 to F-18
(23)	5	"	"
(24)	405	"	E-1 to E-3; F-1 to F-7 F-13 to F-18

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ G-I: PERCENTS OF NUMBERS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	12/100	G-3	G-1 to G-7
(2)	5/100	"	"
(3)	80/100	"	"
(4)	.18	G-5 to G-6	D-1 to D-14; G-1 to G-4
(5)	.25	"	"
(6)	.03	"	"
(7)	.40	"	"
(8)	6.00	G-7 to G-8	D-1 to D-14; G-1 to G-6
(9)	10.00	G-1 to G-2	D-6 to D-7; G-3 to G-4
(10)	4.80	"	"
(11)	36.00	"	"
(12)	8.00	"	"
(13)	$1.10	"	"
(14)	$24.00	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ G-II: ADDING AND SUBTRACTING PERCENTS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(15)	50%	G-11	G-9 to G-11
(16)	60%	"	"
(17)	45%	"	"
(18)	$40	G-12 to G-15	G-1 to G-8
(19)	$80	"	"
(20)	$450	"	"
(21)	$110	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ G-III: PERCENTAGE PROBLEMS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(22)	$2.50	G-20 to G-21	G-1 to G-8
(23)	$14.00	G-17 to G-19	"
(24)	$18.00	"	"
(25)	$24.00	G-17	G-1 to G-8; G-18 to G-19
(26)	$36.00	G-21	G-1 to G-8
(27)	$90.00	G-22	"
(28)	$60.00	G-23	"
(29)	$150.00	"	"
(30)	$120.00	G-18	G-1 to G-8; G-17 to G-19
(31)	$280.00	G-22	G-1 to G-8

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ G-IV: PERCENTAGE EQUATIONS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(32)	125	G-29 to G-31	F-14 to F-16; G-1 to G-8
(33)	30%	G-25 to G-31	"
(34)	12	G-25 to G-26	G-1 to G-8
(35)	60	G-29 to G-31	F-14 to F-16; G-1 to G-8
(36)	25%	G-25 to G-31	"
(37)	5%	G-25 to G-34	F-14 to F-16, G-21
(38)	$4,000	G-29 to G-34	F-14 to F-16; G-20
(39)	8%	G-25 to G-34	F-14 to F-16; G-22
(40)	$400	G-29 to G-34	F-14 to F-16; G-17 to G-19
(41)	25%	G-25 to G-34	F-14 to F-16
(42)	90	G-29 to G-34	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ H-I: MEASURING DIMENSIONS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	800 sq. ft.	H-5 to H-9	A-11; H-4 to H-11 H-18 to H-19
(2)	36,000 cu. ft.	H-16 to H-17	A-11, H-14 to H-19
(3)	28 yds	H-1 to H-3	H-18 to H-19
(4)	300 ft.	"	"
(5)	160 crates	H-14 to H-15 H-18 to H-19	"
(6)	52 sq. ft.	H-12 to H-13	C-13 to C-18, H-6 to H-11; H-18 to H-19
(7)	18 cu. in.	H-19	C-13 to C-18; C-41 to C-42; H-14 to H-18

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ H-II: RATES AND AVERAGES

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(8)	60 miles per. hr.	H-21 to H-23	B-9 to B-11
(9)	8 sq. ft. per. min.	H-24	B-17 to B-19; H-21
(10)	8 miles per. hr.	H-21 to H-23	H
(11)	40 words per. min.	H-24	B-9 to B-11; H-21
(12)	90 miles per. hr.	H-21 to H-23	B-9 to B-11
(13)	8	H-25 to H-28	"
(14)	4	"	"
(15)	6	"	"
(16)	200	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ H-III: UNIT CONVERSION

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(17)	60 in.	H-31 to H-32	H-29 to H-30; H-37
(18)	7 yd.	"	"
(19)	2 hr.	"	"
(20)	8 hr. 15 min.	H-33 to H-34	H-29 to H-32, H-37
(21)	4 ft. 6 in.	"	"
(22)	45 min.	H-33 to H-34, H-36	"
(23)	3 hr. 30 min.	H-33 to H-36	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ H-IV: MEASUREMENT FORMULAS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(24)	6 sq. in.	H-39 to H-40	H-4 to H-11
(25)	24 sq. in.	H-41 to H-42	F-3 to F-7
(26)	314 sq. in.	H-43	"
(27)	62 cu. in.	H-44 to H-45	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ H-V: CONVERSION OF SQUARE UNITS AND CUBIC UNITS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(28)	9 sq. ft.	H-47 to H-48	H-4 to H-11; H-29 to H-32
(29)	27 cu. ft.	H-49 to H-50	H-14 to H-17; H-29 to H-32
(30)	1 sq. ft.	H-47 to H-48	H-4 to H-11; H-29 to H-32
(31)	6 cu. yd.	H-49 to H-50	H-14 to H-17; H-29 to H-32
(32)	21 sq. ft.	H-47 to H-48	H-4 to H-13; H-29 to H-32

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ J-I: SOLVING RATIOS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(1)	150 missiles	J-3 to J-6	F-13 to F-17 J-1 to J-2
(2)	$39	"	"
(3)	75 months	"	"
(4)	180 miles	J-7 to J-9	C-17; F-13 to F-17; J-1 to J-6
(5)	19 pounds	"	"
(6)	750 miles	"	"

(REVERSE SIDE BLANK)

QUIZ ANSWERS

QUIZ J-II: SETTING UP RATIO EQUATIONS

Quiz Problem	Answer	Pages Where Demonstrated	Pages of Related Information
(7)	200 miles	J-16 to J-17	J-3 to J-6; J-11 to J-15
(8)	$90	J-19	"
(9)	123 miles	J-18	"
(10)	42 baskets	J-14 to J-15	"
(11)	$100	J-19	"

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson A

(A1.) 2732

(A2.) 318

(A3.) 273

(A4.) Wrong -- should be 46,345

(A5.) Right C

(A6.) Wrong -- should be 157,126

(A7.) Right C

(A8.) Wrong -- should be 307,333

(A9.) Right C

(A10.) 42,582

(A11.) 111,723

(A12.) 83,230

(A13.) 64,344

(A14.) 86,028

(A15.) 58,519

(A16.) 540

(A17.) 6,000

(A18.) 2400

(A19.) 90

(A20.) 2400

(A21.) 21,0000

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson B-I

(B1.) 6s will fit into 42

(B2.) 81 divided by 9

(B3.) 7 times

(B4.) 6 times

(B5.) 3 r1

(B6.) 3 r4

(B7.) 6 r3

(B8.) 6 r1

(B9.) Remainder too large. Correct answer = 9 r1

(B10.) Right C

(B11.) Right C

(B12.) Remainder too large. Correct answer = 8 r1

(B13.) Can't subtract. Correct answer = 6 r6

(B14.) Remainder too large. Correct answer = 6

(B15.) 1 1/4

(B16.) 2 5/10

(B17.) 7 1/7

(B18.) 1 3/5

(B19.) 2 1/5

(B20.) 4 3/8

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson B-II

(B21.)
$$\begin{array}{r} 154 \\ 3\overline{)462} \\ -3 \\ \hline 16 \\ -15 \\ \hline 12 \\ -12 \end{array}$$

(B22.)
$$\begin{array}{r} 73 \\ 7\overline{)511} \\ -49 \\ \hline 21 \\ -21 \end{array}$$

(B23.)
$$\begin{array}{r} 822 \\ 8\overline{)6576} \\ -64 \\ \hline 17 \\ -16 \\ \hline 16 \\ -16 \end{array}$$

(B24.)
$$\begin{array}{r} 1552 \\ 2\overline{)3104} \\ -2 \\ \hline 11 \\ -10 \\ \hline 10 \\ -10 \\ \hline 4 \end{array}$$

(B25.)
$$\begin{array}{r} 106 \\ 4\overline{)424} \\ -4 \\ \hline 2 \\ -0 \\ \hline 24 \end{array}$$

(B26.)
$$\begin{array}{r} 1506 \\ 2\overline{)3012} \\ -2 \\ \hline 10 \\ -10 \\ \hline 1 \\ -0 \\ \hline 12 \end{array}$$

(B27.)
$$\begin{array}{r} 1205 \\ 5\overline{)6025} \\ -5 \\ \hline 10 \\ -10 \\ \hline 2 \\ -0 \\ \hline 25 \end{array}$$

(B28.)
$$\begin{array}{r} 605 \\ 2\overline{)1210} \\ -12 \\ \hline 1 \\ -0 \\ \hline 10 \end{array}$$

(B29.)
$$\begin{array}{r} 5 \\ 5\overline{)250} \end{array}$$

(B30.)
$$\begin{array}{r} 1 \\ 6\overline{)840} \end{array}$$

(B31.)
$$\begin{array}{r} 104 \\ 3\overline{)312} \\ -3 \\ \hline 1 \\ -0 \\ \hline 12 \end{array}$$

(B32.) Wrong, should be:
$$\begin{array}{r} 62 \\ 2\overline{)124} \\ -12 \\ \hline 4 \end{array}$$

(B33.) Right

(B34.) Wrong, should be:
$$\begin{array}{r} 205 \\ 5\overline{)1025} \\ -10 \\ \hline 2 \\ -0 \\ \hline 25 \end{array}$$

(B35.) Wrong, should be:
$$\begin{array}{r} 82 \\ 8\overline{)656} \\ -64 \\ \hline 16 \end{array}$$

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson B-III

(B36.) 4

(B37.) 2

(B38.) 4

(B39.) 9

(B40.) 7

(B41.) Right

(B42.) 8 is too small

```
      8
90/820
-720
```

(B43.) Right

```
      3
59/179
-177
```

(B44.) 6 is too big

```
      6
44/259
-264
```

(B45.) Wrong place

```
      2
65/1365
```

(B46.) Too big

```
      40
15/6030
```

(B47.) Wrong place

```
      5
50/25,000
```

(B48.) Too big

```
      3
45/1359
```

(B49.) Too small

```
      6
28/1689
```

(B50.) Too small

```
      31
35/1085
-105
  35
```

(B51.) 49

(B52.) 9 with a remainder of 31

(B53.) 51

(B54.) 2 times

(B55.) 0 times

(B56.) 206

(B57.) 41 with a remainder of 6

```
      41
12/498
-48
  18
-12
   6
```


(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson C-1

(C1.) 1/3

(C2.) 3/7

(C3.) $\frac{35}{3}$

(C4.) $\frac{18}{5}$

(C5.) $\frac{14}{9}$

(C6.) $\frac{10}{7}$

(C7.) $\frac{4}{2}$

(C8.) $\frac{6}{3}$

(C9.) $\frac{12}{35}$

(C10.) $\frac{5}{18}$

(C11.) $\frac{6}{28}$

(C12.) $\frac{6}{40}$

(C13.) $\frac{9}{16}$

(C14.) $\frac{16}{15}$

(C15.) $\frac{6}{12}$

(C16.) $\frac{9}{8}$

(C17.) 32 times $\frac{9}{8} = \frac{288}{8}$

(C18.) 12 times $\frac{4}{3} = \frac{48}{3}$

(C19.) 3 divided by 1/3

(C20.) 8 times 2/3

(C21.) 5 times 4/5

(C22.) 4 divided by 2/5

(C23.) 7 times 3/2

(C24.) 9 divided by 4/3

(C25.) $\frac{7}{9} \times \frac{5}{2}$

(C26.) $\frac{6}{7} \times \frac{8}{3}$

(C27.) $\frac{2}{3} \times \frac{3}{2}$

(C28.) 1/2

(C29.) 1/6

LESSON ANSWERS

Lesson C-I (Cont.)

(C30.) 1/9

(C31.) 1/100

(C32.) 2/5

(C33.) 1/7

(C34.) 1/11

(C35.) 3/2

(C36.) 25/16

(C37.) 1/4 ÷ 1/8

(C38.) 19 ÷ 2/7

(C39.) $\frac{3}{5} \div \frac{8}{9}$

(C40.) 1/3 ÷ 2

(C41.) a ÷ b/c

(C42.) $\frac{1}{a} \div \frac{1}{b}$

(C43.) divide

(C44.) the fraction you divide by

(C45.) 2/3 x 1/4 = 2/12

(C46.) 1/8 x 7/2 = 7/16

(C47.) 6/5 x 2/1 = 12/5

(C48.) 3/8 x 1/2 = 3/16

(C49.) 5/4 x 5/9 = 25/36

(C50.) 7/8 x 1/2 = 7/16

(C51.) 6 x 9/2 = 54/2

(C52.) $\frac{3}{8}$

(C53.) $\frac{5}{9}$

(C54.) $\frac{2}{9}$

(C55.) $\frac{5}{8}$

LESSON ANSWERS

Lesson C-II

(C56.) 3/3

(C57.) 9/9

(C58.) 12/12

(C59.) 8/4

(C60.) 18/6

(C61.) 12/3

(C62.) 23/4

(C63.) 11/8

(C64.) 12/6 + 5/6 = 17/6

(C65.) 15/5 + 4/5 = 19/5

(C66.) 2 2/6

(C67.) 6/7

(C68.) 8 6/7

(C69.) 3 2/4

(C70.) 11/8 x 5/2 = 55/16

(C71.) 11/4 x 4/5 = 44/20

(C72.) 11 7/8

(C73.) 11/6 x 3/8 = 33/48

(C74.) 8 8/8 - 2 1/8 = 6 7/8

(C75.) 8 10/7 - 2 5/7 = 6 5/7

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson C-III

(C76.) 1 1/5

(C77.) 2/5 = 2 1/2

(C78.) 3/8 = 2 2/3

(C79.) 6 4/7

(C80.) 4 2/5

(C81.) three

(C82.) four

(C83.) Divide by 7, Answer: 2/3

(C84.) Can't reduce

(C85.) Divide by 3, Answer: 1/6

(C86.) Can't reduce

(C87.) Divide by 2, Answer: 3/4

(C88.) Divide by 6, Answer: 2/3

(C89.) Can't reduce

(C90.) Divide by 5, Answer: 3/5

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson C-IV

(C91.) Yes

(C92.) No

(C93.) No

(C94.) No

(C95.) Yes

(C96.) No

(C97.) 2/8

(C98.) 4/6

(C99.) $\frac{3 \times 3}{12} = \frac{9}{12}$

(C100.) $\frac{2 \times 7}{16} = \frac{14}{16}$

(C101.) 8/20

(C102.) 10/15

(C103.) 14/16

(C104.) 12/14

(C105.) 6/8

(C106.) 3/9

(C107.) 10/12

(C108.) 12/18

(C109.) 6/8

(C110.) 4/6

(C111.) 10/16

(C112.) 3/4 to $\frac{9}{12}$

(C113.) 2/3 to $\frac{4}{6}$

(C114.) 1/2 to $\frac{6}{12}$

(C115.) 6 (2 divides into 12)

(C116.) 7 x 6 or 42

(C117.) 3 x 10 or 30

(C118.) 15

(C119.) 8/12 + 3/12 = 11/12

(C120.) 21/28 - 8/28 = 13/28

(C121.)
$$\begin{array}{r} 9\ 7/8 \\ -4\ 2/8 \\ \hline 5\ /58 \end{array}$$

(C122.)
$$\begin{array}{r} 6\ 9/12 \\ +2\ 8/12 \\ \hline 8\ 17/12 \end{array}$$ or: 9 5/12

(C123.)
$$\begin{array}{r} 3\ 3/15 \\ +2\ 10/15 \\ \hline 5\ 13/15 \end{array}$$

(C124.)
$$\begin{array}{r} 5\ 10/15 \\ -1\ 1/15 \\ \hline 4\ 9/15 \end{array}$$ or: 4 3/5

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson C-V

(C125.) $6\ 7/12 - 8/12 = 5\ 15/12 - 8/12 = 5\ 7/12$

(C126.) $7\ 3/10 - 5\ 5/10 = 6\ 13/10 - 5\ 5/10 = 1\ 8/10$ or $1\ 4/5$

(C127.) $8\ 6/15 - 2\ 10/15 = 7\ 21/15 - 2\ 10/15 = 5\ 11/15$

(C128.) $12/50 \times 5/8 = 60/400$ (Can reduce to $3/20$)

(C129.) $7\ 5/4 + 7\ 2/3 = 14\ 23/12$ (Can reduce to $15\ 11/12$)

(C130.) $10/6 \times 1\ 3/5 = 80/30$ (Can reduce to $2\ 2/3$)

(C131.) $2\ 23/30 + 3\ 1/3 = 5\ 33/30$ (Can reduce to $6\ 1/10$)

(C132.) $3\ 15/60 + 4\ 20/60 + 6\ 12/60 = 13\ 47/60$

(C133.) $7\ 1/12 - 3\ 4/12 = 6\ 13/12 - 3\ 4/12 = 3\ 9/12$ or $3\ 3/4$

(C134.) $5/4 \times 5/8 = 25/32$
$25/32 \times 7/2 = 175/64$ or $2\ 47/64$

(C135.) $10\ 35/56 - 4\ 40/56 = 9\ 91/56 - 4\ 40/56 = 5\ 51/56$

(C136.) $1\ 15/20 - 16/20 = 35/20 - 16/20 = 19/20$

(C137.) $2\ 6/24 + 7\ 20/24 = 9\ 26/24$
$9\ 26/24 + 4\ 9/24 = 13\ 35/24 = 14\ 11/24$

(C138.) $12/5 \times 5/8 = 60/40$
$60/40 \times 5/3 = 300/120$ or $2\ 1/2$

(C139.) $\frac{4}{1} \times \frac{1}{7} = \frac{4}{7}$

(C140.) $\frac{2}{9} \times \frac{4}{1} = \frac{8}{9}$

(C141.) $\frac{1}{10} \times \frac{1}{1} = \frac{1}{10}$

(C142.) $\frac{5}{1} \times \frac{2}{3} \times \frac{1}{1} = \frac{10}{3}$ or $3\ 1/3$

(C143.) $\frac{9}{11} \times \frac{1}{2} = \frac{9}{22}$

(C144.) $\frac{1}{4} \times \frac{1}{20} = \frac{1}{80}$

(C145.) $\frac{1}{1} \times \frac{1}{1} \times \frac{1}{1} = \frac{1}{}$

(C146.) $\frac{10}{23} \times \frac{1}{1} \times \frac{7}{14} = ?$

$\frac{10}{23} \times \frac{1}{1} \times \frac{1}{2} = \frac{10}{26}$ or $5/23$

LESSON ANSWERS

Lesson D-I

(D1.) 25.25

(D2.) 2.67

(D3.) 2.1

(D4.) .09

(D5.) 5.70
+1.23

(D6.) 8.20
- .03

(D7.) .01
56.00
+ 2.90

(D8.) 18.00
- 1.79

(D9.) 100.5

(D10.) 27.6001

(D11.) 66.9949

(D12.) 3.22 (2 places)

(D13.) .08 (2 places)

(D14.) .081 (3 places)

(D15.) 3.476 (3 places)

(D16.) .84

(D17.) .129

(D18.) 7.32

(D19.) .0792

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson D-II

(D20.) .6

(D21.) .005

(D22.) 2.5

(D23.) .09

(D24.) .00022

(D25.) .04

(D26.) .023

(D27.) .0015

(D28.) .06

(D29.) .0004

(D30.) .056

(D31.) .020

(D32.) $4\overline{).1700}$ = .0425

(D33.) $4\overline{).2100}$ = .0525

(D34.) $4\overline{)5.00}$ = 1.25

(D35.) $5\overline{)16.0}$ = 3.2

(D36.) $12\overline{)30.0}$ = 2.5

(D37.) $4\overline{)7.00}$ = 1.75

(D38.) $4\overline{)3.00}$ = .75

(D39.) $20\overline{)4.0}$ = .2

(D40.) $32\overline{)16.0}$ = .5

(D41.) $2\overline{)1.0}$ = .5

(D42.) $5\overline{)4.0}$ = .8

(D43.) $5\overline{)2.0}$ = .4

(D44.) 1/2 = $2\overline{)1}$ = 0.5
3 1/2 = 3.5

(D45.) $\frac{5}{10}$

(D46.) $\frac{3}{100}$

(D47.) $\frac{700}{1000}$

(D48.) $62\frac{1}{10}$

(D49.) one place

(D50.) one place

(D51.) two places

(D52.) one place

(D53.) $13\overline{)39.26}$

LESSON ANSWERS

Lesson D-II (Cont.)

(D54.) 34/13.6

(D55.) 4/28.8

(D56.) 25/750

(D57.) 4/800

(D58.) 16/320

(D59.) 15/300

(D60.) 3/2170

(D61.) 5/10 = 2

(D62.) 3/9.6 = 3.2

(D63.) 2/80.4 = 40.2

(D64.) 25/25,000 = 1,000

(D65.) 2/400 = 200

(D66.) 3/90 = 30

(D67.) 25/50 = 2

(D68.) 15/450 = 30

LESSON ANSWERS

Lesson E

(E1.) $2/\overline{4}$

(E2.) divide by 3, $3/\overline{9}$

(E3.) divide by 5, $5/\overline{15}$

(E4.) divide by 9, $9/\overline{6}$

(E5.) $3/\overline{6} = 2$

(E6.) $8 \times 2 = 16$

(E7.) $3/\overline{9} = 3$

(E8.) $4 \times 5 = 20$

(E9.) $10 \div 5 = 2$

(E10.) $7 \times 5 = 35$

(E11.) $2/\overline{8} = 4$

(E12.) $3/\overline{6} = 2$

(E13.) $6 \times 3 = 18$

(E14.) 3

(E15.) $7/5$

(E16.) $1/2$

(E17.) $7/8$

(E18.) $9/2$

(E19.) $13/4$

(E20.) $13/4$

(E21.) $3/\overline{2}$

(E22.) $1 \div 4$

(E23.) $5 \div 4$

(E24.) $2/\overline{6}$

(E25.) $7/\overline{1}$

(E26.) $3 \div 5$

(E27.) 5×5

(E28.) 7×7

(E29.) 10×10

(E30.) 6^2

(E31.) 9^2

(E32.) $.5^2$

(E33.) $1/4^2$

(E34.) $.10 \times .10$

LESSON ANSWERS

Lesson E (Cont.)

(E35.) 1/2 x 1/2

(E36.) Right

(E37.) Wrong 3 = 9

(E38.) Wrong 17 - 4 = 17-16

(E39.) Wrong 2 x 6 = 2 x 36

(E40.) Wrong 6 = 6 x 6

(E41.) 25

(E42.) 4

(E43.) 81

(E44.) 2

(E45.) 3

(E46.) 5

(E47.) 10

(E48.) 1/3 x 7

(E49.) .05 x 20

(E50.) 1/2 x 10

(E51.) No (12 x 1/6)

(E52.) Yes

(E53.) Yes

(E54.) Yes

(E55.) No (5 x 3%)

LESSON ANSWERS

Lesson F-I

(F1.) 3 times n

(F2.) 2 times b

(F3.) $n^2 = 9$

(F4.) $z^2 = 16$

(F5.) $y^2 = 4$

(F6.) $b^2 = b \cdot b$ or: 3 x 3 so: $b^2 = 9$

(F7.) $y = 7 + 8$

(F8.) $D = 3 \times 3.14 \times 9$

(F9.) $E = 1.2 \times 1/2 \times 1/2$

(F10.) $J = \frac{5^2}{3.14}$

(F11.) 2 amps

(F12.) 1/2 x 2 x 4 = 4 sq. in.

(F13.) $C = \pi d$ or: 3.14 x 4 ft. = 12.56 ft.

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson F-II

(F14.) 8

(F15.) add

(F16.) 5

(F17.) add to 3 to get 11

(F18.) Subtract 2 from to get 9

(F19.) 2 + 11 = 7 Wrong

(F20.) 7 - 2 = 5 Right

(F21.) 6 = 1 + 5 Right

(F22.) 9 = 2 - 7 Wrong

(F23.) 4

(F24.) ... by 2 gives 8?

(F25.) ... into 24 gives 6

(F26.) ... 27 gives 3

(F27.) 27/3 = 9 Right

(F28.) 6 x 6 = 24 Wrong

(F29.) 2/7 = 14 Wrong

(F30.) 3

(F31.) 9

(F32.) subtracted

(F33.) added

(F34.) 7

(F35.) 4

(F36.) x = 4, 4 + 3 = 7

(F37.) y = 8, 8 - 2 = 6

(F38.) d = 100 100/5 = 20

(F39.) K = 2, 16 = 2 x 8

(F40.) n = 7, 7 - 4 = 3

(41.) y = 75, 75/5 = 15

(F42.) b = 7, 7 x 3 = 21

(F43.) x = 5, 9 = 4 + 5

(F44.) K = 3, 3/3 = 1

(F45.) y = 4, 8 = 2(4)

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson G-I

(G1.) 3/100

(G2.) 17/100

(G3.) 33/100

(G4.) 99/100

(G5.) .09

(G6.) .12

(G7.) 20/100 = .20

(G8.) 7/100 = .07

(G9.) 35/100 = .35

(G10.) 51%

(G11.) 7%

(G12.) 20%

(G13.) 1%

(G14.) 99%

(G15.) 750%

(G16.) 25%

(G17.) .50 = 50%

(G18.) .75 = 75%

(G19.) $\frac{250}{100}$ = 2.50 or 2.5

(G20.) $\frac{165}{100}$ = 1.65

(G21.) $\frac{400}{100}$ = 4.00 or 4

(G22.) 2.00 x 5 = 10.00 or 10

(G23.) 1.50 x 8 = 12.00 or 12

(G24.) 1.00 x 23 = 23.00 or 23

(G25.) 1.00 x 5 = 5.00 or 5

(G26.) 3.00 x 5 = 15.00 or 15

(G27.) 5.00 x 5 = 25.00 or 25

(G28.) 8.00 x 5 = 40.00 or 40

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson G-II

(G29.) False

(G30.) False

(G31.) True

(G32.) True

(G33.) True

(G34.) True

(G35.) $500

(G36.) $750

(G37.) $3,750

(G38.) $5,000

(G39.) 50% of 400 thousand = 200 thousand non-rated men

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson G-III

(G40.) Cost for one year = $10.
Cost for 3/4 year = $7.50.

(G41.) Interest for one year = $10.
Interest for 1/2 year = $150.

(G42.) 2 1/3 x $300 = $700

(G43.) .20 x $800 = $160

(G44.) .45 x $1,000 = $450

(G45.) .09 x $200 = $18

(G46.) .01 x $45 = $0.45

(G47.) .15 x $8,000 = $1,200

(G48.) 10% of $5,500 = $550

(G49.) 3% of $2,500 = $75

(G50.)

Store pays:	$50
Mark up:	5
Store charges:	$55

(G51.)

Price:	$200
Tax:	10
Total:	$210

(G52.) 20% of $2,000 = $400

(G53.)

You save:	25% of $4 = $1
You pay:	$4 - $1 = $3

(G54.) 19% of $90 = $17.10

(G55.)

Ship's store price:	$30
Cut-rite price:	34
Price difference:	$ 4

(REVERSE SIDE BLANK)

LESSON ANSWERS

Lesson G-IV

(G56.) Right

(G57.) Wrong (should be: $16/\overline{4.00}$)

(G58.) Wrong (should be: $30/\overline{3.00}$)

(G59.) Right

(G60.) 26% of 100 = 26

(G61.) 16% of 50 = 8

(G62.) 50% of 38 = 19

(G63.) n = $16/\overline{4.00}$ = .25 or 25%

25% of 16 = 4

(G64.) n x 10 = 6

n = $10/\overline{6.0}$ = .6 or 60%

60% of 10 = 6

(G65.) n x 20 = 6

n = $20/\overline{6.0}$ = .3 or 30%

30% of 20 = 6

(G66.) 15% of 20 = 3

(G67.) 25% of 28 = 7

(G68.) 4% of 50 = 2

Lesson G-IV (Cont.)

(G69.) 5% of 20 = 1

(G70.) 50% of 8 = 4

(G71.) n x 8 = 2

(G72.) .06 x n = 20

(G73.) n x 240 = 12

(G74.) .10 x 3,200 = n

(G75.) n x 400 = 48

(G76.) .08 x 500 = n

Interest = $40 per year

10 x $40 = $400 (Answer)

(G77.) n x 600 = 36

Rate = 600/36 = 6%

(G78.) 6% of ? = 1,800

n = .06/1,800

The house sold for $30,000

LESSON ANSWERS

Lesson H-I

(H1.) A = 8 in. B = 8 in. Yes, they are equal.

(H2.) A = 12 in. B = 10 in. A is 2 in. longer than B.

(H3.) 40 eggs

(H4.) 40 eggs

(H5.) 3 ft. x 6 ft. = 18 sq. ft.

(H6.) 4 in. x 5 in. = 20 sq. in.

(H7.) 4 mi. x 8 mi. = 32 sq. in.

(H8.) 3" x 4" = 12 sq. in.

(H9.) 2' x 6' = 12 sq. ft.

(H10.) 3 miles by 6 miles = 18 sq. miles

(H11.) 5 ft. x 4 ft. = 20 sq. ft.

(H12.) 800 sq. ft.

(H13.) Each piece = 8' x 12' = 96 sq. ft.

10 x 96 sq. ft. = 960 sq. ft. in all

(H14.) Each tile = 6" x 6" = 36 sq. in.

Floor = 500 x 36 sq. in. = 18,000 sq. in.

(H15.) 12" x 12" = 144 sq. in.

(H16.) 3' x 3' = 9 sq. ft.

Lesson H-I (Cont.)

(H17.) C

(H18.) a

(H19.) b

(H20.) a

(H21.) b

(H22.) 9/2 yd. x 6 yd. = 27 sq. yd.

(H23.) 81 1/2 x 100'= 4050 sq. ft.

(H24.) 13/2" x 8" = 52 sq. in.

(H25.) 3 x 4 x 3 = 36

(H26.) 2 x 3 x 5 = 30

(H27.) 10 times 12 times 14 = 1680 cubic feet

(H28.) Box A = 24 cu. ft., Box B = 27 cu. ft. Box B is larger.

(H29.) 5/2" times 2" times 3" = 15 cu. in.

(H30.) 20" x 30" x 7/2" = 2100 cu. in.

(H31.) 8 yd. x 17/4 yd. x 7/2 yd. = 119 cu. yd.

(H32.) add

(H33.) multiply

(H34.) multiply

(H35.) 14 in.

(H36.) 12 sq. in.

(H37.) 24 cu. in.

LESSON ANSWERS

Lesson H-II

(H38.) Time = 3 hrs.; Distance = 150 mi.; Rate = 150/3 mph.

Answer = 50 mph.

(H39.) Bob's rate = 300/5 mph. = 60 mph.; Al's rate = 200/4 mph. = 50 mph.

(H40.) 1 in./min.

(H41.) 4/6 or 2/3 in./min.

(H42.) 1 in./min.

(H43.) Red-bottomed Switch Tail, 1 1/2 in. per minute.

(H44.) Bob's rate = 180 words/6 min. = 30 words/min.

Dave's rate = 250 words/10 min. = 25 words/min.

(H45.) 600 gal./3 hr. = 200 gal./hr.

(H46.) $7/\overline{56}$ or 8 hrs. per day.

(H47.) $5/\overline{1500}$ or 300 mi. per day.

(H48.) Total = 700; Number of games = 10; Average = $10/\overline{700}$ = 70

78 was = Above average

(H49.) Average score = $6/\overline{192}$ or 32 points

(H50.) Total 28; Number of numbers = 2; Average = 14

LESSON ANSWERS

Lesson H-III

(H51.) 25 x 3 ft. = 75 ft.

(H52.) 44/4 gal. = 11 gal.

(H53.) smaller units, 2 1/2 x 60 min. = 150 min.

(H54.) divide, 21/7 or 3 weeks

(H55.) divide, 12/3 or 4 yd.

(H56.) multiply, 5 x 12 or 60 in.

(H57.) 3 hrs. 5 min.

(H58.) 5 lbs. 1 oz.

(H59.) 7 ft. 1 in.

(H60.) 6 weeks 2 days

(H61.) No

(H62.) Yes

(H63.) No

(H64.) 4 ft. 16 in.

(H65.) 1 hr. 75 min.

(H66.) 2 days 35 hrs.

(H67.) 5 hrs. 75 min.
-2 hrs. 30 min.
3 hrs. 45 min.

(H68.) 4 weeks 10 days
-1 week 6 days
3 weeks 4 days

(H69.) 4 yd. 4 ft.
- 2 ft.
4 yd. 2 ft.

(H70.) 9 hr. 65 min.
-4 hr. 20 min.
5 hr. 45 min.

(H71.) 10 hr. 80 min.
- 9 hr. 30 min.
1 hr. 50 min.

(H72.) 10 hr. 45 min.
- 8 hr. 16 min.
2 hr. 29 min.

(H73.) 12 ft. 3 in. = 11 ft. 15 in.
- 8 ft. 10 in. - 8 ft. 10 in.
3 ft. 5 in.

(H74.) C

(H75.) C

(H76.) In one minute: 60 x 6 ft. = 360 ft.
or: 360/3 yd. = 120 yd.
In 20 minutes: 20 x 120 yd. = 2400 yd.

LESSON ANSWERS

Lesson H-IV

(H77.) Rectangle = 30 sq. ft.
Triangle = 15 sq. ft.

(H78.) $\frac{200}{2^6} = 100$ sq. ft.

(H79.) $\frac{1'' \times 2''}{2} = 1$ sq. in.

(H80.) $\frac{2'' \times 2''}{2''} = 2$ sq. in.

(H81.) $\frac{4' \times 4'}{2} = 8$ sq. ft.

(H82.) 3.14 x 9 sq. in. = 28.26 sq. in.

(H83.) 3.14 x 100 sq. in. = 314 sq. in.

(H84.) 3.14 x 4 sq. yd. = 12.56 sq. yd.

(H85.) 500 cu. ft.

(H86.) 12 1/2 cu. ft.

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LESSON ANSWERS

Lesson H-V

(H87.) 3 ft. x 3 ft. = 9 sq. ft.

(H88.) 2 x 144 sq. in. = 288 sq. in.

(H89.) 54/27 cu. yd. or 2 cu. yd.

(H90.) 1 sq. yd. = 9 sq. ft., 10 sq. yd. = 90 sq. ft.

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LESSON ANSWERS

Lesson J-I

(J1.) 10 girls

(J2.) 20 girls

(J3.) 40 boys

(J4.) 100 boys

(J5.) $2

(J6.) $10

(J7.) $5

(J8.) n = 3 x 600/2 = 900

Answer = 900 miles

(J9.) n = 480 x 2.5/120 = 10

Answer = 10 gallons

(J10.) n = 8 x 30/12 = 20

Answer = 20 days leave

(J11.) 100/1.5 = n/3

n = 3 x 100/1.5 = 200

Answer = 200 miles

(J12.) 3/2 = n/1

n = 1 x 3/2 = 1 1/2

Answer = 1 1/2 packs

(J13.) 3/1 = n/7

n = 7 x 3/1 = 21

Answer = 21 ft.

(J14.) $\frac{5}{1/2} \text{ to } = \frac{40}{4} \text{ to}$

(J15.) $\frac{3}{3/4} \text{ to } = \frac{1}{1/4} \text{ to}$

(J16.) n = 2 x 11 = 22

$\frac{3/8}{1/8} \text{ to } = \frac{6}{2} \text{ to}$

(J17.) Answer = 250 miles

(J18.) $\frac{100}{1/4} = \frac{400}{(2\ 3/4 - 11/4)}$

n = 11/4 x 400 = 1100

Answer = 1100 men

(J19.) $n = 2\ 2/3 \times \frac{3/4}{2}$

n = 8/3 x 3/8 = 1

Answer = 1 inch

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LESSON ANSWERS

Lesson J-II

(J20.) 2 to 7 = what to 375

(J21.) 2 to 5 = what to 100

(J22.) minutes to crates = 7 to 20 = what to 300

(J23.) 6 to 1 = what to 3

$$\frac{6}{1} = \frac{n}{3}$$

$$n = 3 \times \frac{6}{1} = 18 \text{ miles}$$

(J24.) 2 to 3 = what to 9

$$\frac{2}{3} = \frac{n}{9}$$

$$n = 9 \times \frac{2}{3} = 6 \text{ in.}$$

Lesson J-II (Cont.)

(J25.) $\frac{2\ 1/4}{6}$ to = what to $\frac{}{20}$

$$\frac{2\ 1/4}{6} = \frac{n}{20}$$

$$11 = 20 \times \frac{2\ 1/4}{6} = 7\ 1/2 \text{ in.}$$

(J26.) $\frac{160}{8}$ to = what to $\frac{}{3}$

$$\frac{160}{8} = \frac{n}{3}$$

$$n = 3 \times \frac{160}{8} = 60 \text{ miles}$$

(J27.) $\frac{2}{50}$ to = what to $\frac{}{75}$

$$\frac{2}{50} = \frac{n}{75}$$

$$n = 75 \times \frac{2}{50} = \$3$$

LESSON ANSWERS

Lesson J-11 (Cont.)

(J28.) 15 to 100 = what to 6,300

$$\frac{15}{100} = \frac{n}{6300}$$

$$n = 6300 \times \frac{15}{100} = \$945$$

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