

GED Connection™



MATHEMATICS • PROGRAM 29 Problem Solving

Sample pages from the Workbook
Lesson & Teacher's Guide





Dedication

GED Connection is the product of PBS LiteracyLink®, a service of PBS initiated by a five-year grant from the United States Department of Education Star Schools program. This generous grant has made it possible to reach more adult basic education learners than ever before through the power of public television and the Internet. We offer our thanks and appreciation to the Department of Education for its support of this project and the adult learners who benefit from it.

Many people worked very hard to create these **GED Connection** workbooks, videos, and online lessons. They brought skills, knowledge and, most of all, a deep spirit of dedication to their task: creating instructional tools to help adult learners find their way to lifelong learning and the benefits of full participation in our society.

We dedicate these **GED Connection** materials to the hundreds of thousands of **GED** learners, past, present, and to come, and to those who serve them.

Components of the PBS LiteracyLink® GED Connection System:

WORKBOOKS - Three workbooks – Language Arts, Writing and Reading; Social Studies and Science; and Mathematics – can be used in conjunction with the videos and online activities.



TEACHER'S GUIDE

- This valuable resource provides lesson plans and other teaching materials.

VIDEOS - Thirty-nine, half-hour programs cover the five major subject areas of the GED 2002 exam. The series includes one orientation program and thirty-eight instructional programs. A complete list of programs follows the Teacher's Guide pages in this print preview.



ONLINE ACTIVITIES -

Free learning activities on the web provide learners with practice tests, learning modules for each of the five test areas, and skill-building opportunities.



ONLINE MANAGEMENT SYSTEM -

Via the Internet, instructors can review and give feedback on students' online work and get reports on student data.

Inside This Preview Guide

Mathematics Teacher's Guide pages for Program 29: Problem Solving

For each of the thirty-nine GED Connection lessons you'll find two pages in the LiteracyLink Teacher's Guide. Each lesson plan is loaded with practical information to help you prepare students to get the most out of every lesson using a multimedia combination of videos, workbooks, and online activities.

Mathematics Workbook pages 41-62 for Program 29: Problem Solving

The GED Connection workbooks are designed to provide a foundation from which to build new skills; that's why we recommend you start each lesson with a look at the workbook and have students return to the book as they watch segments of the video and work through the online lessons.

Each workbook chapter corresponds to a video program and a set of Internet lessons and activities. Look for these workbook sections to guide students through the lesson:

The Before You Watch section orients students to the video program.

- Objectives form the focus for each lesson.
- Sneak Preview provides a short chapter pre-test, answers, and feedback.
- Vocabulary defines key content area terms.
- Program Summary explains what students are about to see in the video.

The After You Watch section provides direct instruction and skill practice.

- Key Points to Think About and GED Tips relate the lesson to the GED exam.
- Skill Practice exercises and instruction expand on concepts presented in the video program
- Links relate skills to family life, the community, and the workplace.
- Interdisciplinary Connection bridges the lesson to other GED subject areas.
- GED Practice is a chapter post-test with items and formats similar to those on the new GED Test.

Each workbook also contains a GED Pretest and a GED Practice Test to help students evaluate their GED readiness in that subject area; an Answer Key, complete with explanations; a Reference Handbook, with additional resources for GED preparation; a Glossary; and an Index.

LESSON OBJECTIVES

1. Apply a five-step approach to solving problems.
2. Choose and apply operations correctly.
3. Make sure the results make sense.

PROGRAM 29

Problem Solving



VIDEO OVERVIEW

Major Ideas in the Video Program

- **The Problem-Solving Process** – Understanding the process is often more valuable than getting an answer. Once you understand how to solve a particular type of problem, you can apply the same process to other problems. Follow these five steps:
 - Understand the question.
 - Find the facts you need.
 - Set up the problem with the correct operations.
 - Do the calculations.
 - Make sure your answer is reasonable.
- **Set Up** – Certain words in a problem tell you what operation to use. Some problems can be solved in more than one way.
- **Order of Operations** – When calculating a problem, operations must be performed in a certain order: (1) operations within parentheses, (2) exponents, (3) from left to right, multiplication and division, and (4) from left to right, addition and subtraction.
- **Role of Number Sense** – Once you have an answer, always ask, “Does my answer seem reasonable? Does it make sense?”

People and Ideas to Watch For

- Zalman Usiskin, Professor of Education from the University of Chicago, explains the importance of understanding a problem and the question you are trying to answer.
- Throughout the video, a customer is trying to buy a used car. The car dealer makes suggestions and tries to explain financing options. His explanations are not always correct.
- Dennis Puhr, a GED instructor, helps his students understand how to evaluate car deals and financing options. He explains how to estimate the interest for any large purchase.
- Keith Devlin, Dean of Science from St. Mary’s College, explains the importance of order in solving problems. Durrant Freeman and other GED instructors explain the order of operations.
- Several credit counselors discuss the importance of making a budget to decide whether you can afford a large purchase.



WORKBOOK LESSON

Math Workbook Program 29: Problem Solving, pp. 41–62

- | | |
|--|--|
| <p>Before You Watch,
pp. 41–44</p> <ul style="list-style-type: none"> • Sneak Preview (Pretest), pp. 42–43 • Vocabulary, p. 44 <p>After You Watch, pp. 45–62</p> <ul style="list-style-type: none"> • Key Points to Think About, p. 45 • Basic Operations Review, pp. 46–51
<i>Adding and Subtracting</i>
• <i>Multiplying</i> • <i>Dividing</i>
• <i>Working with Remainders</i> • <i>Writing Equations to Solve Problems</i> • <i>Solving One-Step Equations</i> | <ul style="list-style-type: none"> • Solving Word Problems, pp. 52–55
<i>A 5-Step Strategy to Problem Solving</i> • <i>Too Much or Not Enough Information</i> • <i>Applying Formulas</i> • Solving Multi-Step Problems, pp. 56–59
<i>Breaking the Problem Into Steps</i> • <i>Using the Order of Operations</i> • <i>Solving Set-up Problems</i> • <i>Properties of Operations</i> • GED Practice Questions (Posttest), pp. 60–62 |
|--|--|

INTERNET CONNECTIONS



Student Activities at www.pbs.org/literacy

- | | |
|---|--|
| <p>GED Practice Test</p> <p>Learning Module
Interactive course on math content and skills</p> | <p>Internet-based Activity
Including GED-style practice questions</p> |
|---|--|

SAMPLE TEACHER'S GUIDE PAGES

ACTIVITIES

Set Up the Video Program



1. Preview the video. You may select segments (as time coded on the video cover) for use with your class.
2. Explain that Program 29 focuses on problem solving as a tool for making life decisions. It is also needed for answering questions on the GED Math Test.
3. Say, *Some people think that word problems are hard or tricky. Why do you think word problems are hard for some people?* Discuss their responses.
4. Have learners do the *Sneak Preview* activity on workbook pages 42–43. Explain that the exercise is designed to introduce the topics that will be covered in the video program and corresponding workbook lesson. After the activity, you may wish to discuss the questions and answers using the feedback on page 43.
5. Discuss the *Vocabulary* on page 44.
6. Tell students that the video will describe a five-step approach to problem solving. Say, *As you watch the program, think about the problems that the people are trying to solve and the way they go about solving them. We will discuss these issues after the program.*



Show Program 29

Follow Up the Video Program



1. Several people in the video were planning large purchases. Ask, *How do you decide whether you can afford to buy a car or other purchase? Do you follow the steps described in the program?*
2. Review the simple interest formula shown in the video: Interest = principal \times rate \times time. Show how the formula could be used to find the interest, monthly payment, and amount paid back for a used car. Have students suggest the purchase price, interest rate, down payment, and length of loan.
3. Point out that many life situations require more than one step to find an answer. Ask, *How can you know which step to do first?* Discuss the role of number sense in deciding what to do.
4. Professor Usiskin says that relying on rules and procedures to solve problems is a “crutch.” Ask, *What do you think he means? Do you agree with his thinking?*

Use Workbook Instruction and Practice



1. Discuss the *Key Points* on page 45.
2. Assign instruction and practice on pages 46–59.
3. After learners have finished the lesson, have them work through the *GED Practice* questions on pages 60–62. Explain that these are similar to the questions that they will see on the GED Test. You may go over the questions with the class, discussing both the correct answer and incorrect answer choices that the students found attractive.

Have Students Use the Internet



1. Have students go to the PBS LiteracyLink website at www.pbs.org/literacy. Students should log onto their Home Space and then follow the links to the GED Math online learning module, where they will be able to take an extended, interactive course related to problem solving. Students can also use Internet activities to practice answering GED-type questions that focus on math skills and strategies.
2. A teacher may view the GED online learning modules from the LitTeacher Home Space. Use your own username and password to log onto the PBS LiteracyLink website at www.pbs.org/literacy. Then follow the link to the *GED Connection* online curriculum.

Lead Group Activities



Activity 1: In Your Life

Have students write two sales pitches, one using accurate numbers and one making the deal sound better than it really is. Have students read their deals to the class. Encourage students to use number sense to spot the bad deal.

Activity 2: The Graphic Connection

Have students look at the furniture price list on page 49. Ask, *How is the first column of numbers different from the numbers in the final column?* Remind the students to read all labels to understand the numbers in a graphic.

Activity 3: The Pre-GED Connection

For students who are at the pre-GED level, focus on the application of the order of operations. Write this problem on the board and model each step of the solution:

$$3 + 4 \times (15 - 6) \div 12 - 5.$$

GED Connection

Video Programs/Workbook Chapters

The preceding pages from the Teacher's Guide and the workbook pages which follow refer to one of thirty-nine GED Connection lessons.

The list to the right shows how this lesson fits in the comprehensive curriculum you'll find in GED Connection.

1. GED Connection Orientation

■ LANGUAGE ARTS: WRITING

2. Passing the GED Writing Test
3. Getting Ideas on Paper
4. The Writing Process
5. Organized Writing
6. Writing Style and Word Choice
7. Effective Sentences
8. Grammar and Usage
9. Spelling, Punctuation, and Capitalization
10. The GED Essay

■ LANGUAGE ARTS: READING

11. Passing the GED Reading Test
12. Nonfiction
13. Fiction
14. Poetry
15. Drama

■ SOCIAL STUDIES

16. Passing the GED Social Studies Test
17. Themes in U.S. History
18. Themes in World History
19. Economics
20. Civics and Government
21. Geography

■ SCIENCE

22. Passing the GED Science Test
23. Life Science
24. Earth and Space Science
25. Chemistry
26. Physics

■ MATHEMATICS

27. Passing the GED Math Test
28. Number Sense
29. Problem Solving
30. Decimals
31. Fractions
32. Ratio, Proportion, and Percent
33. Measurement
34. Formulas
35. Geometry
36. Data Analysis
37. Statistics and Probability
38. Introduction to Algebra
39. Special Topics in Algebra and Geometry

Whether you're looking for a car buyer, planning city neighborhoods, or working on your math, any problem is more manageable if you break it down into steps. In this program you'll see how to use a problem-solving process in a variety of situations.



Problem Solving

OBJECTIVES

1. Use basic operations, estimation, and equations in problem solving.
2. Apply a five-step approach to solving word problems.
3. Apply problem-solving strategies to multi-step problems.

Why do we learn math? Math is an essential problem-solving tool. Through our knowledge of math, we can use numbers, operations, and steps to translate a situation into a problem to be solved. As we work, we use number sense to make sure our problem-solving approach is on the right track and our answer makes sense.

The ability to choose appropriate problem-solving strategies and apply them is important to your success on the GED Math Test. You will need to know how to analyze a problem, find the necessary facts, perform the correct operations, and decide whether your result seems reasonable. Your knowledge of estimation will help you carry out these steps. Calculator skills are also needed on Part One of the GED Math Test.

On the following pages, you will find a brief exercise called *Sneak Preview*. It is designed to introduce you to the topics that will be featured in the video program and the corresponding lesson. After you complete the exercise and check your answers, turn to the vocabulary page. There you will find terms that will help you better understand the video and the lesson that follow. After reviewing page 44, you will be ready to watch Program 29.

For additional practice, visit *LiteracyLink* online at <http://www.pbs.org/literacy>.

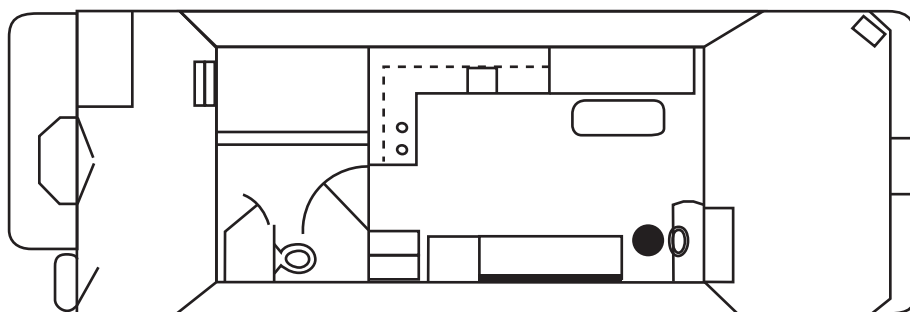
Sneak Preview

This exercise previews some of the concepts from Program 29. After you answer the questions, use the chart on page 43 to help set your learning goals.



FAMILY LINK: Three families living in the same neighborhood decide to spend their vacation together on a rented houseboat. Phillip volunteers to research rental rates and other information for the trip. He sends for a brochure and rate sheet from Star Resorts, which offers houseboat rentals on Lunar Lake. The three families then meet to discuss their options.

FIVE STAR RESORTS ON LUNAR LAKE



SUMMER SEASON (June 15–September 15)

4 Days/3 Nights
\$850

7 Days/6 Nights
\$1250

VALUE SEASON (September 16–June 14)

4 Days/3 Nights
\$550

7 Days/6 Nights
\$850

Answer these questions based on the rate sheet shown above.

- There are eight adults from the three families who want to rent the houseboat together. Phillip wants to know how much each person will pay if they split the rate equally for 7 days/6 nights in the summer season. Which expression best represents the equation Phillip might use?
 - $r = 7 \times 1250$
 - $r = (7 \times 1250)$
 - $r = \frac{850}{8}$
 - $r = \frac{1250}{8}$
 - $r = 1250 \times 8$

2. How much more would it cost these 8 adults to rent a houseboat in the value season for 6 nights, instead of 3 nights?
- (1) \$200
 - (2) \$300
 - (3) \$550
 - (4) \$850
 - (5) Not enough information is given.
3. If 10 neighbors decide to rent a houseboat from Star Resorts for 9 days/8 nights in the value season, what could they expect to spend in total?
- (1) \$105
 - (2) \$850
 - (3) $\$850 + 2$
 - (4) $\$1250/10$
 - (5) Not enough information is given.
4. The group decides to vacation from June 15 to June 18. Two of the neighbors will pay \$100 each for a deposit to Five Star Resorts, to hold the boat. How much more will the group have to pay for the houseboat rental?
- (1) \$1050
 - (2) \$650
 - (3) \$350
 - (4) \$200
 - (5) \$100

Feedback

- If you got all of the answers right... you have a good basic understanding of how to analyze a problem, find the facts, carry out the correct operations, and check the answer for reasonableness.
- If you missed question 1... you need to work on setting up equations, variables, and solution set-ups.
- If you missed question 2... you need to work on how to analyze a problem or on your subtraction skills.
- If you missed question 3... you need to understand when too much or too little information is given.
- If you missed question 4... you need to develop your multi-step problem-solving skills.

Vocabulary for Problem Solving

associative property	a law that states that when adding or multiplying more than two numbers, you can group the numbers in any order without affecting the result; for example, $2 + (3 + 4) = (2 + 3) + 4$
commutative property	a law that states that the order in which you add or multiply numbers does not affect the result; for example, $2 \times 4 = 4 \times 2$
compatible numbers	numbers that are easy to work with in your mind
distributive property	a law that states that when a number is multiplied by a sum written in parentheses, you can find the result by multiplying the number outside the parentheses by each number in the parentheses and then adding; for example, $3 \times (5 + 6) = (3 \times 5) + (3 \times 6) = 15 + 18 = 33$
equation	a mathematical sentence in which two expressions or numbers are equal
factors	the numbers that are multiplied in a multiplication problem
formula	an equation written with variables that shows the constant relationship among the variables
inverse	opposite; for example, addition and subtraction are inverse, or opposite, operations
order of operations	a set of rules that give the sequence for performing the mathematical operations in an expression
product	the result when two or more numbers (factors) are multiplied together; the answer to a multiplication problem
quotient	the result when one number is divided by another; the answer to a division problem
remainder	the amount left over after dividing two numbers that do not divide evenly
regroup	when adding or subtracting, to carry or borrow a quantity from one place value column to another
variable	a letter or symbol used to hold the place of a number in an expression

➔ NOW WATCH PROGRAM 29:

Make a note of the steps in the problem-solving process introduced in the program. Think about whether you've ever used a process like this to solve an everyday problem. Try the process on a math word problem.



After you watch the program, work on:

- pages 45–62 in this workbook
- Internet activities at <http://www.pbs.org/literacy>



Problem Solving

On the following pages, you will learn more about the ideas discussed in the video program and have an opportunity to develop and practice your GED math skills.

GED TIPS

When taking the GED Test, you should:

- Read the problem carefully to find the question it asks you to answer. Make sure your response answers that question.
- If a problem has more than one step, write down the result after each step. This will save you time if you have to go back and rework a step.
- Use rounding, front-end estimation, and mental math to eliminate answer choices and check your work.

Key Points to Think About

In the video program, you explored:

- How people use math in their daily lives as workers, citizens, and family members.
- When to use the four basic operations and strategies for applying them to solve problems.
- How to write and solve equations in a problem-solving situation.

On the GED Math Test:

- You will need to have the basic addition facts such as $4 + 6 = 10$ and $8 + 3 = 11$ memorized.
- You will be expected to read a problem situation and decide which operation or combination of operations you will need to solve the problem.
- You will need to know the correct equation for solving a problem.
- You should apply mental math and estimation strategies to save time and check your work.

As you work through the lesson for Program 29:

- Think about the relationships among the four basic operations and how they can combine to solve problems.
- Always make sure your answers make sense. Think about the size of the numbers and whether they are reasonable for the situation.
- Be aware of the problem-solving situations you encounter in your daily life and how you go about solving them.

Basic Operations Review



COMMUNITY LINK: Pam is calling community members to raise funds for a homeless shelter. She hopes to raise \$1000 during her 4-hour shift. She raises \$125 the first hour and \$415 the second hour. During a break, she adds \$125 and \$415, subtracts the sum from \$1000, and finds that she needs to raise \$460 during the last two hours to meet her goal.

Adding and Subtracting

Adding is combining two or more numbers to find a sum, or total. The procedure we commonly use for adding allows us to add two single-digit numbers at a time.

Follow these steps to add numbers:

1. Write the numbers in a column, lining up like place values.
2. Start with the ones column. Add each column, working from right to left.
3. If the total of any column is more than 9, **regroup**, or carry, the extra digits to the next column on the left.
4. To check your work, estimate an answer and compare.

Daily Transactions

Mon	209
Tues	84
Wed	330
Thurs	145
Fri	362

Example: Jason works as a bank teller. How many transactions did he process from Monday to Wednesday?

Answer: 623 transactions

Check: Round to the nearest hundred and estimate:
 $200 + 100 + 300 = 600$. The answer is reasonable.

$$\begin{array}{r} 11 \\ 209 \\ 84 \\ + 330 \\ \hline 623 \end{array}$$

Subtracting is finding the difference between numbers.

Follow these steps to subtract numbers:

1. Write the numbers so that the larger number is on top.
2. Start with the ones column. Subtract, working from right to left.
3. If the digit on the bottom is larger than the digit on top, regroup or borrow from the next column to the left.
4. To check your work, estimate an answer, or add your result to the number you subtracted. The sum should be the number you subtracted from.

Example: How many more transactions did Jason process on Friday than on Thursday?

Answer: 217 transactions

Check: Using estimation, $350 - 150 = 200$. The answer makes sense. You can also check by adding. $217 + 145 = 362$

$$\begin{array}{r} 512 \\ 362 \\ - 145 \\ \hline 217 \end{array}$$

Multiplying

Multiplying is a way of adding the same number repeatedly. For example, 3×4 means $4 + 4 + 4$ or $3 + 3 + 3 + 3$.

The answer to a multiplication problem is called the **product**.

The numbers that are multiplied are called **factors**.

The product of the factors 3 and 4 is 12.

We show multiplication with a times sign (\times), with a raised dot, or with parentheses: 3×4 $3 \cdot 4$ $(3)(4)$ $3(4)$

TIP: You must have your multiplication facts such as $7 \times 8 = 56$ memorized to solve problems quickly and accurately on the GED Math Test.

▶ Study this example to review the steps for multiplying numbers.

Example: If Jason averages 126 transactions per day, how many will he process in 25 working days?

Step 1. Multiply by the ones digit in 25, regrouping as necessary. Multiply the next column, then add the regrouped amount.

Step 2. Multiply by the tens digit in 25, moving the partial answer over one place to the left. Add the partial answers ($630 + 2520 = 3150$).

Answer: 3150 transactions

Check: Estimate an answer. You know 30×100 is 3000.

The answer is close to the estimate. It makes sense.

STEP 1

$$\begin{array}{r} 126 \\ \times 25 \\ \hline 630 \end{array}$$

STEP 2

$$\begin{array}{r} 126 \\ \times 25 \\ \hline 630 \\ 2520 \leftarrow \text{placeholder zero} \\ \hline 3150 \end{array}$$



When using a calculator to add, subtract, or multiply, press an operations key between each number you enter. Then press the equals key.

Calculator: $2 \ 0 \ 9 \ + \ 8 \ 4 \ + \ 3 \ 3 \ 0 \ = \ 623.$

$3 \ 6 \ 2 \ - \ 1 \ 4 \ 5 \ = \ 217.$

$1 \ 2 \ 6 \ \times \ 2 \ 5 \ = \ 3150.$

In subtraction, it is important to enter numbers in the correct order.

SKILL PRACTICE

Solve using pencil and paper. Then check your work with a calculator.

- $782 + 1050 =$
- $\$1790 - \$859 =$
- $128 \times 8 =$
- A school council figures the cost of planting a tree at \$136. How much will it cost a high school to plant 78 trees?
 - \$2,040
 - \$7,888
 - \$9,054
 - \$10,608
 - \$20,408
- $49 + 917 + 6 =$
- $13,040 - 1,850 =$
- $512 \times 24 =$
- To buy a house, the Hills paid \$13,940 for a down payment, \$1,145 for insurance, and \$1,528 for loan fees. How much did they pay?
 - \$15,085
 - \$15,468
 - \$15,503
 - \$16,613
 - \$17,513



WORKPLACE LINK: Mario leases a copier for his small business. His contract includes 60,000 copies per 3-month period. He will be charged more if he makes extra copies. This month Mario made 24,437 copies. Mario divides 60,000 by 3 to find the average number of copies he can make per month. Mario decides to cut back his copier use next month.

Dividing

Division is the opposite of multiplication. When we divide, we are trying to find out how many times one number goes into another. The answer to a division problem is called the **quotient**.

On the GED Math Test, division can be written three ways.

With a division symbol: $12 \div 4$ with a slash mark: $12/4$ as a fraction: $\frac{12}{4}$

▶ Study this example to review the steps for long division.

Example: Cynthia is counting the money received from ticket sales for a benefit performance of a play. If she counts \$816 and tickets are \$12 each, how many tickets were sold?

Set up the problem using a division bracket. *Think:* About how many times will 12 go into 81, the first two digits? Multiply and subtract.

Think: About how many times will 12 go into 96? Multiply and subtract.

Answer: 68 tickets

Check: Check by multiplying the number you divided by and the quotient.

$$68 \times 12 = 816.$$

The answer is correct.

STEP 1

$$\begin{array}{r} 6 \\ 12 \overline{)816} \\ \underline{-72} \\ 96 \end{array}$$

STEP 2

$$\begin{array}{r} 68 \\ 12 \overline{)816} \\ \underline{-72} \\ 96 \\ \underline{-96} \\ 0 \end{array}$$

Calculator: ←

In division, it is important to enter numbers in the correct order.

You can estimate answers to division problems using your knowledge of the multiplication, or times, tables. Instead of dividing 12 into 816, choose a **compatible number**, a nearby number that is easy to work with in your head. You know that $12 \times 7 = 84$, so ask yourself: How many times will 12 go into 840? The answer is 70. Since 816 is less than 840, the answer will be close to, but less than, 70. On the GED, estimating an answer using compatible numbers is a good way to check your work and eliminate answer choices.

Working with Remainders

A remainder is an amount that is left over in the answer to a division problem. To show a remainder in the quotient, use the letter *r*.

$$15 \div 2 = 7 \text{ r}1$$

Two goes into 15 seven times with a remainder of 1.

You can express a remainder as a fraction by writing the remainder over the number that you are dividing by.

$$28 \div 3 = 9\frac{1}{3}$$

Three will go into 28 exactly $9\frac{1}{3}$ times.

Deciding what to do with a remainder is an important part of problem solving.

► In this situation, think about the meaning of the numbers to decide how to handle the remainder.

Example: Monica is helping her child's teacher plan a field trip to a museum. Parents from the class have volunteered to drive since no school bus is available. There are 30 children in the class, and Monica figures that each driver can take 4 children. How many cars will they need to make the trip?

The problem is a simple one. Divide 30 by 4. $30 \div 4 = 7 \text{ r}2$
Monica will have **7 full cars**.

Now think about the remainder. What does it represent? In this situation, the remainder represents children. Monica will have 7 full cars and 2 children left over. To make the trip, Monica needs one more car.

Answer: 8 cars

Check: 8 cars will make room for 32 children ($8 \times 4 = 32$). Monica cannot take the trip with fewer than 8 cars.

SKILL PRACTICE

Solve. Express remainders as whole numbers.

1. $492 \div 6 =$
2. $1600 \div 3 =$
3. $4500 \div 5 =$
4. $12,809 \div 15 =$

A city library is purchasing new furnishings under the direction of Laurie Reese. Use the price list and any of the four arithmetic operations to solve these problems. Check your work with a calculator.

SPACEMISER FURNITURE AND SUPPLIES		
Cat. #	Item	Price
A4759	Study Station	\$223
A2374	All-Wood Side Chair	\$89
D1432	Book Cart	\$475
Q0492	Standard Book Truck	\$189
W2391	Media Display	\$32
Q4116	Media Storage Center	\$329

5. Laurie has budgeted \$2500 for new chairs. How many All-Wood Side Chairs can she afford?
6. Laurie plans to spend \$1000 to buy a new media storage center and media display units. How much will she have left after buying item Q4116 on the price list?
7. The library committee wants to encourage students to study at the library. How much will it cost to purchase six study stations?
8. Book trucks are used for sorting and moving large numbers of books. Laurie wants to purchase one book cart and five book trucks. How much will these items cost?
9. Laurie also has \$12,500 to purchase new books for the children's section. If the average library-bound picture book costs \$18, to the nearest ten, how many new books can she buy?
(1) 700 (4) 670
(2) 690 (5) 660
(3) 680

Answers and explanations start on page 310.



WORKPLACE LINK: Ben is planning a breakfast for the company's sales force of 30 employees. The total cost cannot exceed \$120. He knows that the number of employees times the cost per breakfast should equal the total cost. Using c for the amount he can spend per person, Ben writes $30c = \$120$. He divides \$120 by 30 to find the value of c .

Writing Equations to Solve Problems

An equation states that two expressions or numbers are equal. The two sides of an equation are connected with an equals sign (=).

Examples: $325 + 175 = 500$ $35 = 47 - 12$ $48 \div 6 = 2 \times 4$

Equations can be used to record many mathematical situations.

▶ The equations in this situation describe measurements.

Example: Rebecca's son is 60 inches tall. Since there are 12 inches in a foot, Rebecca knows her son is 5 feet tall. $1 \text{ foot} = 12 \text{ inches}$ $60 \text{ inches} \div 12 \text{ inches} = 5 \text{ feet}$

Most math problems describe a situation in which one of the numbers in the problem is missing. A letter, called a **variable**, can be used to hold the place of the missing number. Any letter can be used as a variable.

▶ The variable takes the place of the unknown amount of money.

Example: After spending \$15 on her sister, Marilyn had \$38 left. How much did Marilyn have before she bought her sister's gift?

Let the amount before the purchase equal x . Subtract the amount that was spent from the starting amount. The difference is \$38.

$$x - 15 = 38$$

Solving One-Step Equations

An equation is solved once we know the value of the variable that will make the equation true. We do this by using the **inverse**, or opposite, operation of the one used in the problem. Adding and subtracting are inverse operations. So are multiplying and dividing. Performing inverse operations can help us get the variable alone on one side of the equation.

An equation is like a balance scale. As long as we add or take away the same amount on both sides, the sides remain balanced. Likewise, as long as we perform the same operation on both sides of the equation, the equation remains true.



Follow these steps to solve equations:

1. Determine the operation used with the variable.
2. Perform the inverse operation on both sides of the equation.

Example: Marilyn had \$38 left after spending \$15 on a gift. How much did she have before buying the gift?

Write the equation.

Since 15 is subtracted from x , add 15 to both sides of the equation to get x by itself and keep the equation balanced.

$$\begin{aligned}x - 15 &= 38 \\x - 15 + 15 &= 38 + 15 \\x &= 53\end{aligned}$$

Answer: Marilyn had **\$53** before she bought the gift.

Check: Substitute 53 for x and subtract: $53 - 15 = 38$. The solution for x is true.

►► Study how inverse operations are used to find solutions in these examples.

Examples:

Subtract 28 from each side.

$$\begin{aligned}x + 28 &= 100 \\x + 28 - 28 &= 100 - 28 \\x &= 72\end{aligned}$$

Check: $72 + 28 = 100$

Multiply both sides by 3.

$$\begin{aligned}\frac{z}{3} &= 17 \\3 \times \frac{z}{3} &= 17 \times 3 \\z &= 51\end{aligned}$$

Check: $5\frac{1}{3} = 17$

Divide both sides by 30.

$$\begin{aligned}30b &= 120 \\ \frac{30b}{30} &= \frac{120}{30} \\ b &= 4\end{aligned}$$

Check: $30 \times 4 = 120$

SKILL PRACTICE

For each situation, write an equation and solve.

- Dana’s electric bill is \$36. The sum of her electric and gas bills is \$61. How much is her gas bill?
- Lynn had \$624 in her checking account. After writing a check, she had \$458 left. Find the amount of the check.
- Colin worked a number of hours at \$9 per hour and earned \$342. How many hours did he work?
- A number of books divided equally among 6 shelves is equal to 42 books per shelf. How many books are there in all?

PROBLEM SOLVER Connection



Counting up is a mental math technique you can use when doing subtraction problems. This strategy saves you time subtracting numbers in columns and regrouping.

Example: Three months ago, Timon bought a new car. The car dealer advised him to come back for a service check at 10,000 miles. Today, Timon’s car odometer reads 5,380 miles. How many more miles can Timon drive before the service check?

Step 1. Choose the operation: $10,000 - 5,380$.

Step 2. Think: 20 gets me to 5,400; 600 gets me to 6,000; and 4,000 gets me to 10,000.

Step 3. Add the differences: $20 + 600 + 4,000 = 4,620$.

Answer: Timon can drive **4,620 more miles** before his service check.

Describe how you could find the difference between \$185 and \$500 by counting up.

Answers and explanations start on page 310.

Solving Word Problems



FAMILY LINK: Ann's bank statement says that she has a \$620 balance in her checking account. She thought she only had \$520. She reviews each transaction in her check register to see if she made a mistake somewhere. Finally, she realizes that she subtracted a \$50 deposit instead of adding it. The mistake caused a \$100 error in her records.

A 5-Step Strategy to Problem Solving

To solve problems in everyday life, we have to search for information. We ask a question, then we have to find the facts that will help us answer it. In test-taking situations, we are asked a question. We are also given an assortment of facts. To solve the problem, we must choose the facts we need and then use them to answer the question. Many people use a 5-step approach to problem solving. These steps are the key to understanding and solving word problems.

The 5-Step Strategy to Problem Solving

1. Understand the question.
2. Find the facts you need to answer the question.
3. Choose the correct operation(s).
4. Solve the problem.
5. Check to make sure your answer is reasonable.

▶▶ See how the 5-step strategy is applied in this situation.

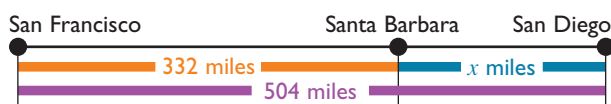
Example: Matt is driving 504 miles from San Francisco to San Diego. After driving about $6\frac{1}{2}$ hours, Matt decides to spend the night in Santa Barbara. If the distance from San Francisco to Santa Barbara is 332 miles, how many miles does Matt have left to drive?

- (1) 172 miles
- (2) about 50 miles per hour
- (3) 836 miles
- (4) 4 hours
- (5) 2158 miles

Step 1. Understand the question. The question asks how many *miles are left* to drive in the trip.

Step 2. Find the facts you need to answer the question. To find how many miles are left, you need the total miles (504) and the miles driven (332).

Step 3. Choose the correct operation. The amount driven plus the amount left equals the total trip. You can write an equation to represent the problem.



$$332 + x = 504$$

$$x = 504 - 332$$

Subtract to find the difference.

Step 4. Solve the problem. $504 - 332 = 172$ miles

Step 5. Check the answer. $332 + 172 = 504$ miles



FAMILY LINK: Natalie is ordering clothes for her child from a catalog. Denim jeans for children are \$16 per pair. Natalie orders 3 pairs for her daughter. On the order form, she copies the description of the jeans and writes 3 under *Quantity* and \$16 under *Unit Cost*. Finally, she multiplies 3 \times \$16 and writes \$48 under *Total Cost*.

Applying Formulas

A **formula** is an equation written with variables that shows the mathematical relationship among the variables. To fill out the catalog order form, Natalie applied the formula for finding total cost.

Total Cost $c = nr$ where c = total cost, n = number of units, and r = cost per unit

When variables are written next to each other, they are to be multiplied. So the formula states that the total cost is equal to the number of items multiplied by the cost of one item.

As applied to Natalie's order: $c = nr$
 $\$48 = 3 \text{ pairs of jeans} \times \16 per pair

►► See how the formula is used to solve for r , the cost of one item.

Example: To encourage students to use the new school library, Arturo bought 6 banners to decorate the school hallways. If the total cost of the banners was \$348, how much did he pay per banner?

Step 1. Write the formula.

$$c = nr$$

Step 2. Substitute known values for the variables.

$$348 = 6r$$

Step 3. Divide both sides by 6.

$$\frac{348}{6} = \frac{6r}{6}$$

$$58 = r$$

Answer: The cost of one banner is **\$58**.

Check: Substitute \$58 for r : $\$58 \times 6 = \348 .

You can also estimate to check answers. Use compatible numbers: \$348 is close to \$360, and $\$360 \div 6 = \60 . Since \$58 is close to \$60, the answer makes sense.

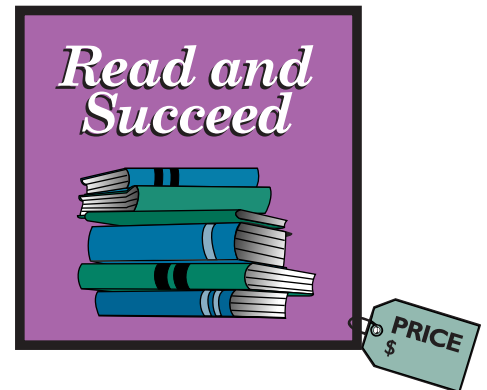
Another useful formula is the distance formula.

Distance $d = rt$ where d = distance, r = rate, and t = time

In other words, multiply the rate of travel by the time traveled to find the distance traveled.

►► See how the distance formula is applied to find time in this situation.

Example: Wanda hauls goods by truck from Savannah to Nashville, a distance of 495 miles. Because of bad weather, Wanda expects to average 45 miles per hour. How long will it take her to make the trip?



Step 1. Write the formula.

$$d = rt$$

Step 2. Replace the variables with the known values.

$$495 = 45t$$

Step 3. Divide both sides by 45.

$$\frac{495}{45} = \frac{45t}{45}$$

$$11 = t$$

Refer to page 340
for a copy of the
GED formulas page.

Answer: Wanda can drive the distance in **11 hours**.

Check: Substitute 11 for t . $45 \times 11 = 495$

SKILL PRACTICE

Use the cost and distance formulas to help solve each problem.

- For an after-school program, Eunsook bought 36 board games. Each game cost \$9. What was the total cost for the games?
- A computer repairer bought 8 hard drives at a total cost of \$1432. How much did she pay for each hard drive?
- A grocery store bought a case of shampoo for \$432. If the store paid \$3 per bottle, how many bottles were in the case?
- John is planning a trip cross country. If he drives 8 hours a day at an average rate of 55 miles per hour, how many miles can he drive per day?
- A plane travels 1725 miles in 3 hours. What is the plane's rate of travel?
 - 575 miles per hour
 - 625 miles per hour
 - 3450 miles per hour
 - 5175 miles per hour
 - Not enough information is given.

SCIENCE Connection



Engineers use formulas to find out whether a structure can support the required amount of pressure. Think of the floor of your living room. It has to support the pressure from furniture and people in the room. This pressure, also called the floor's design live load, is measured in pounds per square foot (psf).

In science, this formula is written: $p = \frac{F}{A}$, where p = pressure (or design live load), F = force or weight, and A = surface area.

Example: The surface area of a living room is 300 square feet. If the estimated weight of the furniture and the maximum number of people in the room are about 2400 pounds, what is the floor's design live load?

Step 1. Substitute the values from the problem into the formula.

$$p = \frac{F}{A} \quad p = \frac{2400}{300}$$

Step 2. Divide: $\frac{2400}{300} = 8$ psf

Answer: The room's live load is **8 pounds per square foot**. Since the building codes require that the floor supports at least 40 pounds per square foot, the floor is not in any danger of collapsing.

Try this one: A room has an area of 180 square feet. The furniture and occupants weigh about 1620 pounds. **What is the floor's live load in psf?**

Solving Multi-Step Problems



FAMILY LINK: Jein is buying a new washer and dryer. After paying \$150 as a down payment, she will make 24 monthly payments of \$34 each. Jein calculates that she will pay a total of \$966 for the new appliances.

Breaking the Problem into Steps

Many problems have more than one step. Usually, the additional steps involve finding some of the facts needed to answer the question asked in the problem.

In the situation above, Jein has to find the total of the down payment and the monthly payments to know how much she will spend for the washer and dryer. She knows the amount of the down payment, but she has to calculate the total of the monthly payments. She does this by multiplying \$34 by 24 months.

Step 1. First find total of monthly payments. $\$34 \times 24 = \816

Step 2. Add monthly payments to down payment. $\$816 + \$150 = \mathbf{\$966 \text{ total}}$

You can apply the 5-step plan to multi-step problems. Once you identify the question you have to answer, look for the facts you need to answer it. Do you have all the facts? If not, look for a way to calculate one or more of the numbers you need.

► In this distance problem, an extra step is needed to calculate one of the needed facts.

Example: Max drove from Lincoln to Norfolk and back in 4 hours. If the distance from Lincoln to Norfolk is 124 miles, what was Max's average rate of travel?

- (1) 31 miles per hour
- (2) 38 miles per hour
- (3) 54 miles per hour
- (4) 62 miles per hour
- (5) 64 miles per hour

You're right if you chose (4) **62 miles per hour**. Find the total distance;

Max drove twice the distance given in the problem, or 248 miles.

Use the distance formula with 248 miles as the total distance.

Check: $62 \times 4 = 248$

$$d = rt$$

$$248 = r \cdot 4$$

$$\frac{248}{4} = \frac{r \cdot 4}{4}$$

$$62 = r$$

Using the Order of Operations

When a problem has more than one step, the order in which you perform operations could affect the answer.

Consider this expression:

$$8 + 4 \times 5$$

If you add first, the answer is 60.

$$(8 + 4) \times 5 = 12 \times 5 = 60$$

If you multiply first, the answer is 28.

$$8 + (4 \times 5) = 8 + 20 = 28$$

Both answers can't be correct.

To avoid these kinds of issues, mathematicians have agreed upon a correct order to perform operations. The steps are shown below. You will need to know these steps to solve multi-step problems and to evaluate expressions on the GED Math Test.

The Order of Operations

- FIRST** Do operations that are grouped in **parentheses**.
SECOND Do **multiplication** and **division** steps from **left to right**.
LAST Do **addition** and **subtraction** steps from **left to right**.



Some calculators (such as the calculator provided for Part I of the GED Math Test) are programmed to use the order of operations. However, many are not. Try this experiment with your calculator.

Calculator: $8 + 4 \times 5 =$

Using the order of operations, you need to multiply 4 and 5 before you add 8. Now, enter the numbers and operations in the order shown above. If the result is 28, your calculator performed the multiplication step first even though the addition step was entered first.

If the result is 60, your calculator added before it multiplied: $8 + 4 = 12$ and $12 \times 5 = 60$.

If your calculator does not follow the order of operations, enter the problem according to the order of operations.

Calculator: $4 \times 5 + 8 =$

To learn more about the capabilities of your calculator, turn to page 337.

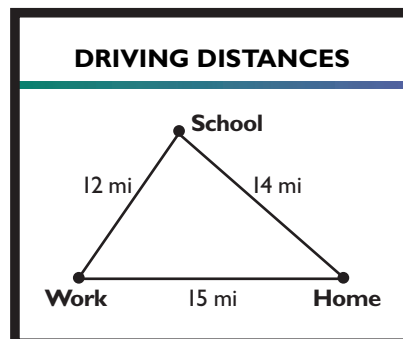
SKILL PRACTICE

Use the order of operations to find the value of the following expressions.

- $9 \times 6 \div 2 - 10$
- $(62 \times 5) \div (8 + 2)$
- $100 - (90 \div 2)$
- $50 \div 5 + 20$
- $7(14 - 8 + 3)$
- $(3 \times 42) + (60 \div 4)$

Questions 7 and 8 are based on the diagram below. You may use your calculator.

- Rachel drives from home to work and back on Monday, Tuesday, and Wednesday. How many miles does she drive on those days altogether? (*Hint*: Start by finding the distance she drives to work and back each day.)
- On Thursday and Friday, Rachel drives from home to work at 8 A.M. Then she drives from work to school at 6:30 P.M. She returns home from school at 9:30 P.M. How many miles does she drive on Thursday and Friday combined?





FAMILY LINK: Robert is helping his son do his math homework. “I know the answer is \$210. I added \$15 and \$55 and multiplied by 3. But I have to show my work, and I don’t know how to write what I did,” his son said. Robert helped his son write each step. He put the sum in parentheses and then multiplied. The problem setup was written $3(\$15 + \$55)$.

Solving Set-up Problems

Some items on the GED Math Test ask you to select a correct method for solving a problem instead of finding the solution. These problems do not require calculations. Instead, you need to find an expression that shows the correct numbers, operations, and order of steps.

▶▶ Think about the method you would use to solve this problem.

Example: Marie earns \$16 per hour for overtime hours. She worked 8 hours overtime last week and 6 hours overtime this week. Which expression could be used to find Marie’s overtime pay for the two-week period?

- (1) $\$16 \times 8 \times 6$
- (2) $\$16(8 + 6)$
- (3) $8(6) + \$16$
- (4) $6(\$16 + 8)$
- (5) $8(6) + 8(\$16)$

You’re right if you chose (2) **$\$16(8 + 6)$** . In this expression, \$16 (the overtime hourly wage) is multiplied by the sum of 8 and 6 (the total overtime hours worked).

There is another way to work the problem. You could find the overtime pay for each week and add: $\$16(8) + \$16(6)$. Both choice (2) and this expression yield the same result. Both are correct.

$$\$16(8 + 6) = \$16(14) = \$224 \quad \$16(8) + \$16(6) = \$128 + \$96 = \$224$$

To solve GED set-up problems, think about how you would calculate an answer to the problem. Put your ideas into words. Then substitute numbers and operations symbols for the words.

Properties of Operations

To recognize the correct setup, you should be familiar with these important properties.

The **commutative property** applies only to addition and multiplication. It means that you can add or multiply numbers in any order without affecting the result.

$$8 + 9 = 17 \quad \text{OR} \quad 9 + 8 = 17$$

$$7 \times 6 = 42 \quad \text{OR} \quad 6 \times 7 = 42$$

The **associative property** works only for addition and multiplication. It means that when you add or multiply more than two numbers, you can group the numbers any way that you like without affecting the result.

$$(5 + 8) + 10 = 13 + 10 = 23$$

OR

$$5 + (8 + 10) = 5 + 18 = 23$$

$$(6 \times 2) \times 3 = 12 \times 3 = 36$$

OR

$$6 \times (2 \times 3) = 6 \times 6 = 36$$

The **distributive property** says that a number outside parentheses can be multiplied by each number inside the parentheses. Then the products are added or subtracted according to the operation symbol.

$$\begin{aligned} 8(8 + 6) &= 8(8) + 8(6) \\ 8(14) &= 64 + 48 \\ 112 &= 112 \end{aligned}$$

On the GED Math Test, your setup may not seem to be among the answer choices. Try applying these properties to the choices to see whether the setup is written a different way.

$$\begin{aligned} 5(12 - 3) &= 5(12) - 5(3) \\ 5(9) &= 60 - 15 \\ 45 &= 45 \end{aligned}$$

SKILL PRACTICE

Solve each problem.

- In January, 58 parents attended the PTA meeting. In February, 72 parents attended, and 113 in March. Which expression represents the total attendance for the 3 months?
 - $58 + 72 + 1133$
 - $3(58 + 72 + 113)$
 - $113 + 72 + 58$
 - $58(72 + 113)$
 - $3(113 - 58) + 72$
- Which of the following expressions is the same as $(5 \times 15) - (5 \times 8)$?
 - $5 \times (15 - 5) 8$
 - $5(15 \times 8)$
 - $5(15 + 8)$
 - $(5 \times 8) \times 15$
 - $5(15 - 8)$
- Lamar earned \$20,800 last year, and his wife, Neva, earned \$22,880. Which expression could be used to find the amount they earned per month last year?
 - $2(\$22,880 + \$20,800)$
 - $(\$22,800 - \$20,800) \div 12$
 - $12(\$22,880 - \$20,800)$
 - $(\$22,880 + \$20,800) \div 12$
 - $(\$20,800 + \$22,800) \div 2$
- Alexa sold 12 sweatshirts at \$23 each and 28 T-shirts at \$14 each. Which expression represents total sales?
 - $12(\$23) + 28(\$14)$
 - $12(\$23 + \$14)$
 - $28(\$14 + \$23)$
 - $12 + \$23 + 28 + \14
 - $28(12) + \$23(\$14)$

CALCULATOR Connection



Suppose you are solving a set-up problem. You know how to do the math, but you don't recognize any of the setups offered as answer choices. You may have used a correct, but different, approach. Your calculator can help.

Example: Phyllis buys two software programs, each costing \$150. There is a \$25 rebate on each program. Which expression shows the combined cost?

- $2(\$150)(\$25)$
- $2(\$150) + 2(\$25)$
- $2(\$150) - 2(\$25)$
- $\$150 - 2(\$25)$
- $2(\$150) - \25

Step 1. Think about how you would solve this problem. Perhaps you would add and subtract: $\$150 + \$150 - \$25 - \25 . Your approach is not among the choices, however.

Step 2. Do the math using your approach: $\$150 + \$150 - \$25 - \$25 = \$250$. Now use your calculator to evaluate each setup until you find the one that yields your answer. Which expression is correct?

GED PRACTICE



PART ONE DIRECTIONS: Choose the one best answer to each of the following problems. Use a calculator wherever necessary.

- Lucia spent \$84 for 4 shirts and \$66 for 2 pairs of jeans. If each shirt cost the same amount, what was the price of one shirt?
 - \$84
 - \$65
 - \$42
 - \$33
 - \$21


Questions 2 and 3 are based on the following situation.

The Primo Camping Supply Company is holding a team-building seminar for its 84 employees. There will be 4 to 7 employees on each team. The teams will work on Saturday, for $2\frac{1}{2}$ hours in the morning and 4 hours in the afternoon.

- A manager suggests putting 6 employees on each team. Which of the following expressions could be used to find how many teams the employees would form?
 - $84 \div 6$
 - $(84 \div 7) + (84 \div 4)$
 - 7×4
 - $84 \div (7 - 4)$
 - 84×6
- The entire seminar will last for 8 hours. Based on the information given, which expression best represents how much time will be left for lunch and breaks?
 - $8 - 2\frac{1}{2} - 4$
 - $2\frac{1}{2} + 4 - 8$
 - $8(2\frac{1}{2} + 4)$
 - $8(2\frac{1}{2}) - 8(4)$
 - Not enough information is given.

Questions 4 and 5 are based on the sign.

Plant Depot Trees	
Plum trees	\$35
Orange trees	\$46
Lemon trees	\$28



- Before tax, how much more will Warren spend for a plum tree than a lemon tree?
 - \$0.70
 - \$7.00
 - \$11.00
 - \$18.00
 - Not enough information is given.
- Warren brought \$100 with him to buy trees. Which trees can he buy with this money and still have at least \$10 change?
 - two plum trees and one orange tree
 - two orange trees
 - three lemon trees
 - four lemon trees
 - three plum trees
- For a school trip to a museum, the school pays \$135 for a bus which holds up to 50 students and \$3 per student for admission. How much will it cost for 80 students?

(1) \$240	(4) \$476
(2) \$270	(5) \$510
(3) \$375	
- Eva spent \$102 for six tickets to a baseball game and souvenirs. If the souvenirs cost a total of \$24 and the tickets all had the same price, which expression could be used to find the cost of one ticket?
 - $\$102 - 6 + \24
 - $\$102 \div 6 - \24
 - $\$102 \times \$24 \div 6$
 - $(\$102 - \$24) \div 6$
 - $(\$24 \div 6) + (\$102 \div 6)$

8. The attendance at the Maine South football game was 3450 last Friday. This Friday's attendance was 4126. How many fans attended the games in all?
- (1) 676
 - (2) 1676
 - (3) 3450
 - (4) 7276
 - (5) 7576

Questions 9 and 10 are based on the following information.

**Magic Waters
Amusement Park**

ENTRANCE FEES

4-Hour Passes:
Adults \$12, Children \$8

All-Day Passes:
Adults \$20, Children \$14

9. Anna decides to take her nephews to the water park. She plans to buy 4 children's all-day passes. Which of these expressions could be used to find how much Anna will pay for the children's passes?
- (1) $4(\$8)$
 - (2) $4(\$12)$
 - (3) $4(\$14)$
 - (4) $\$20 \div 4$
 - (5) $(\$20 + \$14) \div 4$
10. If Anna decides to buy half-day passes, how much will 4-hour passes for 1 adult and 4 children cost her?
- (1) \$32
 - (2) \$44
 - (3) \$48
 - (4) \$76
 - (5) Not enough information is given.
11. The distance from Kuala to Meising is 140 kilometers. A freight train makes the round trip in 7 hours. What is the average number of kilometers the train travels an hour?
- (1) 20
 - (2) 24
 - (3) 30
 - (4) 40
 - (5) 48
12. Marina's gross pay for one pay period is \$852. Her take-home pay for the same period is \$696. Approximately how much is deducted from Marina's pay for taxes and insurance?
- (1) less than \$50
 - (2) between \$50 and \$100
 - (3) between \$100 and \$200
 - (4) between \$200 and \$250
 - (5) between \$250 and \$300
13. On a trip to Lake Spencer, Theo makes two stops. He drives 220 miles before making the first stop, an additional 280 miles before the second stop, and an additional 175 miles before arriving at Lake Spencer. How many miles per hour did he drive on the trip?
- (1) 55
 - (2) 225
 - (3) 455
 - (4) 675
 - (5) Not enough information is given.
14. Which pair would represent compatible numbers for the expression $1388 \div 69$?
- (1) 1400 and 70
 - (2) 1380 and 70
 - (3) 1400 and 69
 - (4) 1300 and 70
 - (5) 1300 and 60

PART TWO DIRECTIONS: Choose the one best answer to each of the following problems. *You may not use a calculator on these problems.*

- 15.** Decide which of the following operations you should perform first in the expression: $60 - \frac{32}{8} - 5 \times 3 + 10$.

- (1) $60 - 32$
- (2) $\frac{32}{8}$
- (3) $8 - 5$
- (4) 5×3
- (5) $3 + 10$

- 16.** Phil repairs VCRs for an appliance store. He is paid \$50 for each repaired VCR. In June he repaired 8 VCRs. In July he repaired 12. Which of the following expressions could be used to find how much he was paid for the repairs during the two months?

- (1) $\$50(8) + 12$
- (2) $\$50(12) + 8$
- (3) $\$50(8 + 12)$
- (4) $\$50(12)(8)(2)$
- (5) $\frac{\$50(12)(8)}{2}$

- 17.** Bella drove 340 miles in 5 hours. In miles per hour, what was Bella's average rate of speed for the trip? (*Hint:* Use the distance formula from the GED formulas page.)

- (1) 15
- (2) 55
- (3) 60
- (4) 64
- (5) 68

- 18.** What is another way of writing the expression 137×6 ?

- (1) 1376
- (2) $137 + 6$
- (3) $\frac{1}{137} \times \frac{1}{6}$
- (4) $137(6)$
- (5) $\frac{137}{6}$

Questions 19 through 21 are based on the following table.

Mixture	Amount (in ounces)	Boiling Point (in minutes)
A	8	8
B	5	4
C	5	10
D	4	6

- 19.** The table states the amount (in ounces) and boiling points (in minutes) of four chemical mixtures. What is the difference in minutes between the fastest and the slowest boiling points?

- (1) 2
- (2) 4
- (3) 6
- (4) 8
- (5) 14

- 20.** Mixtures B, C, and D are poured into a 20-ounce jar. The mixtures do not change in amount. Which expression states the amount of room left in the jar?

- (1) $5 + 5 + 4$
- (2) $2(5) + 4$
- (3) $20 - 2(5 - 4)$
- (4) $20 - 5 - 4$
- (5) $20 - 5 - 5 - 4$

- 21.** According to the table, which mixture would reach freezing point first?

- (1) A
- (2) B
- (3) C
- (4) D
- (5) Not enough information is given.

Answers and explanations start on page 310.

GED Connection

Video Programs/Workbook Chapters

1. GED Connection Orientation

■ LANGUAGE ARTS: WRITING

2. Passing the GED Writing Test
3. Getting Ideas on Paper
4. The Writing Process
5. Organized Writing
6. Writing Style and Word Choice
7. Effective Sentences
8. Grammar and Usage
9. Spelling, Punctuation, and Capitalization
10. The GED Essay

■ LANGUAGE ARTS: READING

11. Passing the GED Reading Test
12. Nonfiction
13. Fiction
14. Poetry
15. Drama

■ SOCIAL STUDIES

16. Passing the GED Social Studies Test
17. Themes in U.S. History
18. Themes in World History
19. Economics

20. Civics and Government
21. Geography

■ SCIENCE

22. Passing the GED Science Test
23. Life Science
24. Earth and Space Science
25. Chemistry
26. Physics

■ MATHEMATICS

27. Passing the GED Math Test
28. Number Sense
29. Problem Solving
30. Decimals

31. Fractions
32. Ratio, Proportion, and Percent
33. Measurement
34. Formulas
35. Geometry
36. Data Analysis
37. Statistics and Probability
38. Introduction to Algebra
39. Special Topics in Algebra and Geometry

Components

VIDEOS

Engaging documentary-style videos introduce content and give learners a chance to hear from experts in various fields. Students see how the skills they are learning for the GED exam relate to work, home, and community life. All 39 half-hour programs are available on VHS tape – \$2,925.

WORKBOOKS

Three full-color workbooks cover all five subject areas and provide lots of skill-building and test-taking practice. Each workbook chapter corresponds to a video program and supplemental online activities.

“Before You Watch” sections in the workbook orient students to the video program. “After You Watch” sections provide direct instruction and skill practice. Each workbook also contains a GED Pretest and a GED Practice Test, an Answer Key, and a Reference Handbook – \$15 each or \$40 per set of three.

Workbook Titles

- Language Arts: Reading and Writing ■
- Science and Social Studies ■
- Mathematics



FAST TRACK

Learners who primarily need to review the subject matter and focus on test-taking skills can use the Fast Track package. Fast Track includes the Orientation, five “Passing the Test” programs plus The Essay. Seven video programs – \$525
Fast Track workbook – \$15



ONLINE ACTIVITIES

Free learning activities on the Web at www.pbs.org/literacy provide learners with practice tests, learning modules for each of the five test areas, and skill-building Internet activities.

Organizations may use the Online Management System for an annual fee of \$500 per virtual classroom. Statewide licensing available; call for prices.



TEACHER'S GUIDE

Each lesson plan is loaded with practical information to help you prepare students to get the most out of every lesson using videos, workbooks, and online activities. This invaluable resource covers GED Connection and pre-GED Workplace Essential Skills – \$25 each.

o r d e r f o r m

Bill To:

Organization _____ Contact _____

Address _____

City _____ State _____ Zip Code _____

Phone _____ (Ext) _____ Fax _____ E-Mail _____

Ship To: (if different from billing address)

Organization _____ Contact _____

Address _____

City _____ State _____ Zip Code _____

Phone _____ (Ext) _____ Fax _____ E-Mail _____

Item Description	Program #	Price Per Item	Qty.	Extended Price

Merchandise total _____

6% sales tax (KY orders) _____

Shipping & Handling (see below) _____

Total Order _____



Please send me a free 30-day preview for:

- GED Connection**
- Workplace Essential Skills
- Please send me your free KET Adult Learning Quarterly newsletter.

Questions? Comments? Ready to Order?

Call: (800) 354-9067

Fax: (859) 258-7396

E-mail: AdultEd@KET.org

Write: KET Enterprise Division
560 Cooper Drive
Lexington, KY 40502-2200

Shipping & Handling: For orders up to \$1,000 – add 8% s/h, For orders over \$1,000 – add 6% s/h. Minimum shipping charge = \$5.

Method of payment:

- Check or Money Order enclosed #: _____
- P.O. #: _____
- MasterCard #: _____
- Visa #: _____
- Exp. Date _____

(credit card orders over \$50 only)

Federal tax I.D. # 61-0722558

VIDEOS
WORKBOOKS
TEACHER'S GUIDE
MORE
INFORMATION

**Call to order,
or request a
free 30-day preview!**

KET
The Kentucky Network
Enterprise Division
560 Cooper Drive
Lexington, KY 40502-2200
(800) 354-9067
(859) 258-7396 Fax
adulted@ket.org
www.ket.org/GED

More About GED Connection

GED Connection offers students excellent preparation for the new GED 2002 exam and for the world beyond. Its multimedia approach makes GED preparation accessible for students with a variety of learning styles.

GED Connection covers all five subject areas and addresses changes in the form and substance of the new GED exam. GED Connection presents topics in workplace and other real-world contexts; describes cross-disciplinary relationships; explains how to interpret maps, charts, and other graphic data; provides instruction and practice on the new alternate form of grid and graph questions on the Math Test; and describes and demonstrates the new Casio® fx-260 scientific calculator, which will be used on the Math test.

Videos

All 39 half-hour programs are available on VHS tape, individually packaged with lesson-specific descriptions of the learning focus and objectives as well as time-coded listings of program highlights, for \$2,925.

Fast-Track Videos

For learners who primarily need to review the subject matter and focus on test-taking skills for the new exam, the Fast Track package includes: Orientation, Passing the GED Writing Test, the GED Essay, Passing the GED Reading Test, Passing the GED Social Studies Test, Passing the GED Science Test, and Passing the GED Math Test. Seven programs for \$525; Workbooks, \$15 ea.

Workbooks

Three, full-color workbooks cover all five subject areas and provide lots of skill-building and test-taking practice. \$15 each or \$40 per set of three.

Online Activities

Free! To use the Web activities, learners register at www.pbs.org/literacy.

Online Management System

Organizations may use the system for an annual fee of \$500 per teacher/virtual classroom. Statewide licensing available. Call for prices.

Teacher's Guide

A wealth of information, \$25 each. Includes Workplace Essential Skills materials.

Be sure to ask about statewide licensing and bulk discounts! Prices do not include shipping.

