Breakthrough to Math

TEACHER’S DIRECTORY

by Stephanie Irwin
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Introduction to *Breakthrough to Math*

*Breakthrough to Math* is a sequential learning program of individualized instruction, complete with diagnostic, prescriptive, and evaluative tools which can be self-administered by students with minimum teacher involvement.

Each book in the series teaches a specific math skill or a group of closely related skills. The series begins with basic number concepts. It progresses in small increments through basic whole number operations to more difficult math skills and concepts.

*Breakthrough to Math* was developed at the Adult Education Resource Center at Rowan College (formerly Glassboro State College) in New Jersey. It was pilot tested in adult resource centers throughout New Jersey.

This teacher’s directory describes the components of the series and explains how to use them. It also includes suggestions for classroom management, a complete outline of each text in the series, and answer keys for all the placement and assessment materials.
The Components of *Breakthrough to Math*

The *Breakthrough to Math* program consists of a Locator test, a Placement Inventory, the Student Books and Teacher’s Guides, Mastery Checkup tests, and a Student Profile.

**Locator** The Locator is a brief screening device to determine whether a student is able to perform the basic operations of adding, subtracting, multiplying, and dividing whole numbers. The Locator consists of eight problems. All students should take this test as a first step in the *Breakthrough to Math* program. The Locator is easy to administer and could be used during registration and enrollment. The Locator test appears on page 14.

Check the student’s answers, and then use the Locator Referral to interpret the test results. The Referral indicates which section of the Placement Inventory the student should begin with.

**Placement Inventory** The Placement Inventory is a diagnostic test for assessing the student’s math skills and weaknesses. The Placement Inventory questions are sequenced and matched to the *Breakthrough to Math* levels and texts. The Placement Inventory is available on the *Breakthrough to Math* product page of the New Readers Press catalog at www.newreaderspress.com.

The Locator determines where in the Placement Inventory the student should begin. The Placement Inventory pinpoints the level and book the student should study.

Placement Inventory questions 1–22 are correlated to Level 1 Books 1–3. These books deal with whole number identification and adding and subtracting whole numbers.

Placement Inventory questions 23–37 are correlated to Level 1 Books 4–6. These three books cover multiplying and dividing whole numbers and solving whole number word problems.

Placement Inventory questions 38–80 are correlated to Level 2 Books 1–6. The six books of this level deal with fractions, decimals, and percents.

Placement Inventory questions 81–119 are correlated to Level 3 Books 1–5. The five books of this level deal with basic algebra.

Placement Inventory questions 120–140 are correlated to Level 4 Books 1–3. These three books cover plane geometry and volume.

Administer one section of the Placement Inventory at a time. If a student successfully completes a section, then administer the next section of the Placement Inventory. If the student misses questions in the section, she should work in the books that correlate with those questions. The Answer Key for the Placement Inventory begins on page 16.

**Books** The books in the series are grouped into levels. Level 1 deals with basic computational skills with whole numbers. Level 2 deals with fractions, decimals, and percents. Level 3 deals with algebra. Level 4 deals with geometry. (See pages 10–13 for a full outline of the four levels.)

Each book begins with a short diagnostic pre-test, with an answer key following it. A pre-test referral indicates which chapters the student needs to study. (Students were directed to the appropriate book by the Placement Inventory.)

A post-test at the end of the book helps the instructor determine if the student has mastered the skills taught in the book. A post-test referral indicates which chapters the student should review if he has missed any questions.

There are no pre- or post-tests in the word problem books in Levels 1 or 2 (Book 6 in both levels). Students directed to either book should work through the entire book.

**Mastery Checkups** A Mastery Checkup may be used after each level is completed. The Mastery Checkup is a post-test for the entire level to determine if the student has mastered the skills taught in that level. The student takes the test when she has completed all the books she needs in that level. Use the Mastery Checkup Referral to direct the student back to the appropriate books and chapters if she misses any questions in the
Checkup. The Mastery Checkups are available online at www.newreaderspress.com.

**Student Profile** The Student Profile lists the math skills covered in the four levels of the *Breakthrough to Math* series. The Student Profile appears on page 57. Print a copy of the Student Profile for each student so that you can record the student’s progress and keep it on file.

Each math skill on the Student Profile is correlated to the book in which the skill is taught, and to the Placement Inventory questions and the Mastery Checkup questions which test that skill.

Maintain a Student Profile record for each student. After she has answered the appropriate sections of the Placement Inventory, record the results. Circle the numbers of any questions she has answered incorrectly. Then you will be able to tell at a glance what the student’s needs are so that you can direct her to the appropriate book.

When a student has completed a level of the series and has taken the Mastery Checkup for that level, record the results on the Profile. Circle the numbers of any questions he has missed. The Profile will show the student’s progress in the series and identify any remaining weaknesses.

When you are satisfied that a student has mastered the skills in a level, the student should proceed to the first book of the next level and take the pre-test. She should then work through that level.
Summary of Sequence: How to use *Breakthrough to Math*

1. **Locator**
   - Give student Locator.
   - Check answers.
   - Use Locator Referral to select appropriate Placement Inventory section for student to begin.

2. **Placement Inventory**
   - Administer appropriate Placement Inventory section.
   - Check Placement Inventory answers.
   - If student successfully completes a section of the Placement Inventory, administer the next section.

3. **Student Profile**
   - Record Placement Inventory results on Student Profile.
   - Use Student Profile to determine which books student needs to study.

4. **Books**
   - Give student appropriate book.
   - Student takes pre-test.
   - Check pre-test answers.
   - Use pre-test referral to determine which chapters the student needs to study.
   - Student works through appropriate chapters.
   - Student takes book post-test.
   - Check post-test answers.
   - Use post-test referral to determine if student needs to review any chapters.

5. **Mastery Checkup**
   - When the student completes all the books he needs in a level, have him take the Mastery Checkup for that level.
   - Check Mastery Checkup answers.
   - Use Mastery Checkup Referral to determine if student needs to repeat any chapters in that level.

6. **Student Profile**
   - Record Mastery Checkup results on Student Profile.

7. **Next Level**
   - Give student Book 1 of next level.
   - Student takes book pre-test.
   - Student works through level, following sequence described above.

Placement Inventory, Mastery Checkups 1–4, and the Student Profile are available online at www.newreaderspress.com. The Student Profile also appears on page 57 of this book.
Suggestions for Classroom Management

Your students probably come from a variety of situations. They may be people who have had little success with math because they were poor readers or maybe because they had math phobia. Maybe they are in remedial programs or special education programs. They may be in prisons or hospitals. Some may be teacher aides or in training to become aides.

Regardless of who your students are, *Breakthrough to Math* offers math to them in a clear, nonthreatening manner. Math is a language that makes sense—when it is taught as such.

It’s up to you to get the ball rolling. Your students won’t just come into the class, grab the right material, and start working! The sight of all those tests and books might cause some of them to keel over in a faint or to panic and run out of the room!

To make learning math more inviting and less scary, spread the materials out on a table. Don’t stack them up! When class begins, you might start something like this:

> You are all here for a reason, so we might as well get started. The sooner the better, I think, because some of you may be worried or nervous. Math does that to a lot of people. Too bad, because it can make sense and be fun to do. I hope you’ll all feel that way when we are finished—but I sure don’t expect that you feel that way now.

All of you probably know some math already. [Pick up Locators and Placement Inventories.] These will help to pinpoint what you do and don’t know about math already. [Pick up Student Profiles.] These will tell the various math skills you need to know and where to find them—which book to start with.

All of you probably won’t start in the same book. But each book is set up the same way. There is a pre-test at the beginning of every book. Some of the questions are like the questions in the Placement Inventory you will take soon. This is because sometimes a person makes a mistake on one question but really knows how to do the math. So this pre-test is another chance to see if you really do need to learn a certain skill or if you already know it. The answer key will tell you which lessons or pages to work on.

After you finish introducing the series, start the diagnostic work. Reassure your students that this is not a “pass or fail” test. It’s a way to find out where they need to start working on their math skills. Repeat that everyone may start at a different place. But they are not competing against each other.

You can decide whether you want students to check their own answers or not. The size of the class, temperament of the students and teacher, time, and other factors will go into your decision.

If you want the students to be totally self-directed, make sure they know the order of the steps to take to start working in this series. (See Summary of Sequence on page 7 of this Directory.) If your students are to be self-directed, you should set up a system that allows them to seek help from you when they need it.

If you take the responsibility for checking the diagnostic work, then you can direct the student each step of the way. You can check her answers, in her presence preferably. Ask how she did the items she missed. By following her thought process, you can see where she got mixed up. This will make it easier for you to help her learn the effective way to tackle the problem.
Whether students are self-directed or teacher-directed, be sure to set up some clear checkpoints.* Do you want to check all the Placement Inventories or Profiles before students start working in the texts? Do you want to check pre- and post-tests and go over the results with each student? Do you want to check all the Mastery Checkups and mark the Profiles? Do you want the students to watch as you check their work and mark their Student Profiles?

Make sure that what you want and expect is clear to you and your students. Build a communication plan so that changes can be made if needed. For instance, a student may start out self-directed, but then get overwhelmed. Make it easy for students to change to a more teacher-directed program without feeling that they have failed.

The reverse may happen, too. Students may need or want to be told what to do at first. But then, they may take off on their own when they get into the work. By all means, encourage that.

* Even if the diagnostic and evaluative processes are self-directed, there are some items you should check. Check Placement Inventory questions 52 and 53, and check Mastery Checkup 2 questions 28 and 29 to see if the student cancelled before multiplying fractions. If not, direct the student to the cancelling chapter in Level 2 Book 3.
Contents of *Breakthrough to Math*

**LEVEL 1**

**Book 1: Understanding Numbers**
- Chapter 1. Counting
- Chapter 2. Numerals and Number Words
- Chapter 3. 1-Place Numbers
- Chapter 4. 2-Place Numbers
- Chapter 5. More 2-Place Numbers
- Chapter 6. Multiple-Choice Questions
- Chapter 7. Values of 2-Place Numbers
- Chapter 8. Finding Values of 2-Place Numbers When the Tens Are the Same
- Chapter 9. 3-Place Numbers
- Chapter 10. 4-Place Numbers
- Chapter 11. Place Values in 1- to 7-Place Numbers
- Chapter 12. Money Numbers
- Chapter 13. Writing Checks

**Book 2: Adding Whole Numbers**
- Chapter 1. Adding Numbers
- Chapter 2. Adding 2-Place Numbers
- Chapter 3. Multiple-Choice Questions
- Chapter 4. Adding 3-Place Numbers
- Chapter 5. Adding 4-Place Numbers
- Chapter 6. Adding More Than Two Numbers
- Chapter 7. Adding More Than Three Numbers
- Chapter 8. Adding More Than Two 2-Place Numbers
- Chapter 9. Adding More Than Two 3- and 4-Place Numbers
- Chapter 10. Adding Numbers With Different Place Values
- Chapter 11. More Basic Addition Facts
- Chapter 12. Carrying When You Add 2-Place Numbers
- Chapter 13. Carrying With 3- and 4-Place Numbers
- Chapter 14. Adding Money Numbers

**Book 3. Subtracting Whole Numbers**
- Chapter 1. Subtracting Numbers
- Chapter 2. Basic Subtraction Facts
- Chapter 3. Subtracting 2-Place Numbers
- Chapter 4. Multiple-Choice Questions
- Chapter 5. Subtracting 3- and 4-Place Numbers
- Chapter 6. Borrowing in Order to Subtract
- Chapter 7. Borrowing With 3-Place Numbers
- Chapter 8. Borrowing More Than Once
- Chapter 9. Subtracting From a Zero
- Chapter 10. Borrowing From a Zero
- Chapter 11. Subtracting From Two Zeros
- Chapter 12. Borrowing With 4-Place Numbers
- Chapter 13. Subtracting Money Numbers

**Book 4. Multiplying Whole Numbers**
- Chapter 1. Multiplying Numbers
- Chapter 2. Multiplying 2-Place Numbers
- Chapter 3. Multiplying 3-Place Numbers
- Chapter 4. Multiplying 4-Place Numbers
- Chapter 5. Carrying When You Multiply
- Chapter 6. Multiple-Choice Questions
- Chapter 7. Carrying More Than Once
- Chapter 8. Multiplying by 2-Place Numbers

**Book 5. Dividing Whole Numbers**
- Chapter 1. Dividing Numbers
- Chapter 2. Dividing 2-Place Numbers
- Chapter 3. Dividing Larger Numbers
- Chapter 4. Dividing When Numbers Don’t Fit
- Chapter 5. Getting More Than Zero When You Subtract
- Chapter 6. Multiple-Choice Questions
- Chapter 7. Dividing by 2-Place Numbers
- Chapter 8. Remainders
- Chapter 9. Dividing With Zeros
Contents of Breakthrough to Math

**Book 6. Word Problems With Whole Numbers**
- Chapter 1. Asking Questions With Word Problems (Including Word Clues for Adding)
- Chapter 2. Word Clues for Subtracting
- Chapter 3. Word Clues for Multiplying
- Chapter 4. Word Clues for Dividing
- Chapter 5. Mixed Word Clues

**LEVEL 2**

**Book 1. Understanding and Comparing Fractions**
- Chapter 1. Understanding Fractions
- Chapter 2. Word Problems With Fractions
- Chapter 3. Proper and Improper Fractions
- Chapter 4. Multiple-Choice Questions
- Chapter 5. Changing Improper Fractions into Mixed Numbers
- Chapter 6. Changing Mixed Numbers into Improper Fractions
- Chapter 7. Fractions of Equal Value
- Chapter 8. Reducing Fractions to Lowest Terms
- Chapter 9. Finding Common Denominators
- Chapter 10. Comparing Fractions by Making Equivalent Fractions

**Book 2. Adding and Subtracting Fractions**
- Chapter 1. Adding Fractions With the Same Denominator
- Chapter 2. Multiple-Choice Questions
- Chapter 3. Adding Fractions With Different Denominators
- Chapter 4. Adding Mixed Numbers
- Chapter 5. Word Problems With Fractions
- Chapter 6. Subtracting Fractions With the Same Denominator
- Chapter 7. Subtracting Fractions With Different Denominators
- Chapter 8. Subtracting Mixed Numbers With the Same Denominator
- Chapter 9. Subtracting Mixed Numbers With Different Denominators

**Book 3. Multiplying and Dividing Fractions**
- Chapter 1. Multiplying Fractions
- Chapter 2. Cancelling Before You Multiply Fractions
- Chapter 3. Multistep Word Problems With Fractions
- Chapter 4. Multiplying Mixed Numbers
- Chapter 5. Dividing by Fractions
- Chapter 6. Dividing With Mixed Numbers

**Book 4. Decimal Fractions**
- Chapter 1. Understanding Decimal Fractions
- Chapter 2. Mixed Numbers in Decimal Form
- Chapter 3. Adding Decimals
- Chapter 4. Word Problems With Decimals
- Chapter 5. Multiple-Choice Questions
- Chapter 6. Subtracting Decimals
- Chapter 7. Multiplying Decimals
- Chapter 8. Multiplying Decimals by 10, 100, or 1,000
- Chapter 9. Dividing Decimals by Whole Numbers
- Chapter 10. Dividing Whole Numbers by Decimals
- Chapter 11. Dividing Decimals by Decimals
- Chapter 12. Dividing by 10, 100, or 1,000
- Chapter 13. Rounding Off Decimals
- Chapter 14. Changing Proper Fractions to Decimals

**Book 5. Percents**
- Chapter 1. Understanding Percents as Fractions
- Chapter 2. Changing Fractions to Percents
- Chapter 3. Understanding Percents as Decimals
- Chapter 4. Changing Decimals to Percents
- Chapter 5. Word Problems With Percents
- Chapter 6. Finding the Percent When the Part and the Whole Are Known
Chapter 7. Finding the Part When the Percent and the Whole Are Known
Chapter 8. Multiple-Choice Questions
Chapter 9. Finding the Whole When the Percent and the Part Are Known
Chapter 10. Understanding Percent Questions
Chapter 11. Percents Greater Than 100%
Chapter 12. Decimals or Fractions Within Percents
Chapter 13. Finding the Percent of Change When the New and Old Amounts Are Known
Chapter 14. Finding the New Amount When the Old Amount and the Percent of Change Are Known
Chapter 15. Finding the Old Amount When the New Amount and the Percent of Change Are Known

Chapter 1. Steps in the Problem-Solving Process
Chapter 2. Two-Step Word Problems—Finding an Average
Chapter 3. Multiple-Choice Questions
Chapter 4. Other Two-Step Word Problems

LEVEL 3
Book 1. Signed Numbers
Chapter 1. Positive and Negative Numbers
Chapter 2. Word Problems With Positive and Negative Numbers
Chapter 3. Adding When the Signs Are the Same
Chapter 4. Multiple-Choice Questions
Chapter 5. Adding When the Signs Are Different
Chapter 6. Adding More Than Two Signed Numbers
Chapter 7. Subtracting Signed Numbers
Chapter 8. Subtracting More Than Two Signed Numbers
Chapter 9. Multiplying Signed Numbers

Chapter 10. Multiplying More Than Two Signed Numbers
Chapter 11. Dividing Signed Numbers
Chapter 12. Using More Than One Operation to Find an Answer

Book 2. Solving Equations
Chapter 1. Variables
Chapter 2. Word Problems With Constants and Variables
Chapter 3. Evaluating Algebraic Expressions
Chapter 4. Using More Than One Operation to Evaluate Algebraic Expressions
Chapter 5. Multiple-Choice Questions
Chapter 6. Solving Equations With One Inverse Operation
Chapter 7. Solving Equations With Two Inverse Operations
Chapter 8. Combining Like Variables
Chapter 9. Combining Variables to Solve Equations
Chapter 10. Solving Equations With Variables on Both Sides
Chapter 11. Solving Literal Equations

Book 3. Word Problems in Algebra
Chapter 1. Using Formulas to Solve Problems
Chapter 2. Writing Your Own Equations to Solve Word Problems
Chapter 3. Using a Graphic Organizer to Solve Word Problems
Chapter 4. Solving Multiple-Choice Set-Up Problems
Chapter 5. Ratio
Chapter 6. Proportion
Chapter 7. Proportion Problems With Added Steps

Book 4. Exponents, Roots, and Polynomials
Chapter 1. Factors
Chapter 2. Exponents
Chapter 3. Square Roots
Name __________________________

Date __________________________

1.  5
   + 4
   __

2.  17
   + 28
   __

3.  9
   − 5
   __

4.  55
   − 36
   __

5.  8
   × 3
   __

6.  29
   × 5
   __

7.  3\overline{369}

8.  8\overline{155}
Answers for Locator

1. 9
2. 45
3. 4
4. 19
5. 24
6. 145
7. 123
8. 19 r3

Locator Referral

If a student missed this Locator question:

Have the student answer these Placement Inventory questions:

1, 2, 3, or 4
1–22 (covering Level 1 Books 1–3)
5, 6, 7, or 8
23–37 (covering Level 1 Books 4–6)

If the student didn’t miss any Locator questions

34–80 (covering Level 1 Book 6 and Level 2 Books 1–6) *

* Questions 34–37, covering the last book in Level 1, deal with word problems using whole numbers. They are included in this testing section because some students may be able to do the basic operations but not know how to apply them to word problems. If the student has trouble with questions 34–37, you may want to direct her to Level 1 Book 6, before she proceeds with the Level 2 books.

If the student successfully completes questions 34–80, administer the next section of the Placement Inventory, questions 81–119.

If the student successfully completes questions 81–119, administer the next section of the Placement Inventory, questions 120–140.

Administer only one section of the Placement Inventory at a time to a student. If he has trouble with a section, do not administer any more sections. The student should enter the Breakthrough to Math program at the point at which he starts to have trouble answering the questions.
1. How many dots are in the box?

   • • • • •  __5__

2. Write the numbers that are left out.

   56, 57, __58__, 59, __60__, __61__, 62

3. Write the number that comes next.

   998, 999, __1,000__

Write the numerals for these number words.

4. four thousand, eight hundred ninety-three  __4,893__

5. one hundred fifteen dollars and five cents  __$115.05__

Write the number words for these numerals.

6. 47 __forty-seven__

7. $103.16 __one hundred three dollars and sixteen cents__

8. How many tens are in 45?  __4 tens__

9. How many hundreds are in 302?  __3 hundreds__

10. Circle the biggest number:  __81__  80  78
Book 2

Add these numbers.

11. $325 + 142 = \underline{467}$  
   14. $38 + 45 = \underline{83}$

12. 
   \[
   \begin{array}{c}
   201 \\
   + 121 \\
   \hline
   322
   \end{array}
   \]

13. $253 + 13 = \underline{266}$  

16. $1.23 + 3.42 + .75 = \underline{\$5.40}$

Book 3

Subtract these numbers.

17. $68 - 42 = \underline{26}$

18. $895 - 453 = \underline{442}$

19. $73 - 58 = \underline{15}$

20. $427 - 192 = \underline{235}$

21. $712 - 356 = \underline{356}$

22. $\$32.00 - 4.89 = \$27.11$
**Book 4**

Multiply these numbers.

23. \[ \frac{23 \times 2}{46} \]

24. \[ \frac{312 \times 2}{624} \]

25. \[ \frac{695 \times 8}{5,560} \]

**Book 5**

Divide these numbers.

28. \[ 48 \div 4 = \underline{12} \]

29. \[ 768 \div 8 = \underline{96} \]

30. \[ 98 \div 14 = \underline{7} \]

31. \[ 715 \div 18 = \underline{39 \, r13} \]

32. \[ 803 \div 4 = \underline{200 \, r3} \]

33. \[ 130 \div 10 = \underline{13} \]
Solve these word problems.

34. The Wilsons want to buy a used car.
   They have $2,200.
   The car they like costs $3,495.
   They must find out how much more money they need.
   What should they do? Circle one.
   
   add   subtract   multiply   divide
   How much more money do they need? $1,295

35. Four women share an apartment.
   Their heating bill for March is $115.28.
   They must figure out how much each woman owes.
   What should they do? Circle one.
   
   add   subtract   multiply   divide
   How much does each woman owe? $28.82

36. George bakes 25 loaves of bread.
   He wants to know how much money he would make if he sold each loaf for $1.25.
   What should he do? Circle one.
   
   add   subtract   multiply   divide
   How much money would he make? $31.25

37. Carla goes to an auto supply store.
   She finds an air filter for $9.98.
   She finds a can of oil for $4.93.
   She finds an oil filter for $6.50.
   Carla wants to figure out how much these items will cost altogether.
   What should she do? Circle one.
   
   add   subtract   multiply   divide
   How much will the items cost altogether? $21.41
Book 1

38. Write the fraction that tells what part of each circle is shaded.

\[
\begin{array}{c}
\frac{1}{4} \\
\frac{3}{8}
\end{array}
\]

39. Change \( \frac{7}{3} \) into a mixed number. \( 2\frac{1}{3} \)

40. Change \( 1\frac{7}{8} \) into an improper fraction. \( \frac{15}{8} \)

41. Make the equivalent fraction: \( \frac{1}{4} = \frac{4}{16} \)

42. Reduce \( \frac{12}{15} \) to its lowest terms: \( \frac{4}{5} \)

43. Find a common denominator for \( \frac{3}{5}, \frac{2}{3}, \) and \( \frac{4}{9} \). \( 45 \)

44. Which is largest: \( \frac{7}{8}, \frac{3}{4}, \) or \( \frac{2}{3} \)? \( \frac{7}{8} \)

Book 2

From now on, reduce all fraction answers to lowest terms. Change improper fraction answers to mixed numbers.

45. \[
\frac{2}{9} + \frac{5}{9} = \frac{7}{9}
\]

46. \[
\frac{1}{3} + \frac{1}{2} = \frac{5}{6}
\]

47. \[
1\frac{3}{5} + 7\frac{2}{3} = 9\frac{4}{15}
\]

48. \[
\frac{5}{9} + \frac{5}{9} = 1\frac{1}{3}
\]

49. \[
6\frac{1}{2} - 2\frac{1}{5} = 4\frac{3}{10}
\]

50. \[
\frac{5}{8} - 2\frac{3}{4} = 2\frac{3}{8}
\]
**Book 3**

51. \( \frac{3}{7} \times 3 = \) \( \frac{9}{7} \)

52. \( \frac{13}{18} \times \frac{1}{9} = \) \( \frac{13}{162} \)

53. \( 4\frac{2}{3} \times 1\frac{2}{7} = \) \( \frac{4}{3} \times \frac{9}{7} = \frac{36}{21} = 6 \)

54. \( \frac{1}{5} \div \frac{1}{3} = \) \( \frac{3}{5} \)

55. \( 2\frac{1}{2} \div 1\frac{1}{5} = \) \( 2\frac{1}{12} \)

* Student should cancel before multiplying in questions 52 and 53.

**Book 4**

56. Write three-tenths as a decimal. \( .3 \)

57. Check the correct answer:

\[
3.006 = \\
\checkmark \text{ three and six-thousandths} \\
\text{ three thousand and six} \\
\text{ three and six-hundredths}
\]

58. \( .2 + 29 + 6.8 + .001 = \) \( 36.001 \)

59. \( 6.031 - .9 = \) \( 5.131 \)

60. \( 7.01 \times .02 = \) \( .1402 \)

61. \( .0035 \div .05 = \) \( .07 \)

62. Round off .88 to the nearest tenth. \( .9 \)

63. Change \( \frac{1}{5} \) into a decimal. \( .2 \)
64. Write 40% as a fraction. \[
\frac{4}{10} = \frac{2}{5}
\]

65. Change \(\frac{3}{5}\) into a percent. \(60\%\)

66. Write 8% as a decimal. \(0.08\)

67. Change .03 into a percent. \(3\%\)

68. What percent of 80 is 20? \(25\%\)

69. What is 25% of 360? \(90\)

70. 65% of what number is 260? \(400\)

71. What is 125% of 80? \(100\)

72. $33 is 5 \frac{1}{2}\% of what amount? \(600\)

73. The old price was $5.00.
   The new price is $7.50.
   What is the percent of increase? \(50\%\)

74. What is $12.50 decreased by 16%? \($10.50\)

75. The current price is $30.
   This is 25% less than the old price.
   What was the old price? \($40\)
Solve these word problems.

76. In December, there were 3,000 people working at a car factory.
   In January, 500 people were laid off.
   What percent of the workers were laid off in January?
   (Round off your answer to the nearest tenth.) _______16.7%_______

77. Hailey’s truck gets 15.7 miles per gallon of gas.
    She puts 10 gallons in her truck before she leaves for a trip.
    How many miles can she travel on 10 gallons of gas? _______157 miles_______

78. John’s typing teacher timed John’s typing each day.
    On Monday, he typed 45 words per minute.
    On Tuesday, he typed 46 words per minute.
    On Wednesday, he typed 54 words per minute.
    On Thursday, he typed 51 words per minute.
    On Friday, he typed 59 words per minute.
    What was John’s average number of words per minute? _______51 words per minute_______

In the next two questions, write down what steps you must take to solve the problem.
For instance, you might have to add and then divide.

79. Naomi is paid $8.20 an hour for doing odd jobs.
    She worked 4 1/4 hours on Monday, 4 3/4 hours on Tuesday, and 5 1/4 hours on Thursday.
    How much money did she make in all?
    Step 1. Add up her hours.
    Step 2. Multiply step 1 answer by $8.20.
    How much did she make? _______$116.85_______

80. Negasi paid $616 for a new couch that was on sale.
    The regular price was $770.
    What percent was the couch marked down?
    Step 1. Subtract ($616 from $770) to find amount saved.
    Step 2. Find what percent step 1 answer (part) is of $770 (whole).
    What percent was the couch marked down?
    (Round off your answer to the nearest percent.) _______20%_______
81. What number does the long line stand for? \(-2\)

(Each line stands for one whole number.)

\[
\begin{array}{c|c|c|c|c|c}
& & & & & \\
0 & 1 & 1 & 1 & 1 & \\
\end{array}
\]

86. \((10) - (5) - (-2) = \_7\_

87. \((-12)(-4) = \_48\_

82. \((-3) + (-5) = \_8\_

88. \((-3)(5)(6) = \_90\_

83. \[
\begin{array}{c}
13 \\
+ & -8 \\
\hline
5
\end{array}
\]

89. \[
\frac{36}{12} = \_3
\]

84. \((-8) + (7) + (-9) = \_10\_

90. \(2(5 + 2) - \frac{20}{5} = \_10\_

85. \[
\begin{array}{c}
5 \\
- & -5 \\
\hline
10
\end{array}
\]
91. Write an algebraic expression that says: Fifteen divided by an unknown number. \( \frac{15}{x} \)

92. Find the value of \( a + 2b \) when \( a = 1 \) and \( b = 2 \). \( 5 \)

93. If \( n - 13 = 27 \), then \( n = \) \( 40 \)

94. Add: \( 3x + 3x = \) \( 6x \)

95. Multiply: \( 4(3y) = \) \( 12y \)

96. If \( x + 2x + 3 = 9 \), then \( x = \) \( 2 \)

97. If \( 5(x + 2) = 3(x + 10) \), then \( x = \) \( 10 \)

98. If \( p + q + r = s \), then \( r = s - p - q \)
Book 3

Solve these word problems.

99. Javier was driving at 50 miles an hour.
   How long did it take him to drive 200 miles?
   Use the formula: Distance = (Rate)(Time) ____________ 4 hours ____________

100. Mickey and Minnie went on diets.
     Mickey lost \(\frac{1}{3}\) as much as Minnie did.
     Mickey lost only 9 pounds.
     How much did Minnie lose? _______ 27 pounds _______

101. The Bears played 100 ball games.
     They won 80 games.
     What is the ratio of games won to games played?
     Reduce your answer. \(\frac{80}{100} = \frac{4}{5}\) or 4:5

102.* 12 feet of lumber costs $40.
       How much will 30 feet cost? _______ $100 _______

103.* The Flaky Pastry Shop is having a sale.
       Two pieces of pastry cost $.75.
       How much will two dozen pieces cost? _______ $9.00 _______

* Student should use proportions to solve questions 102 and 103.
104. List the factors of –36. \[±1, ±2, ±3, ±4, ±6, ±9, ±12, ±18, ±36\]

105. \[4^3 = 64\]

106. \[\sqrt{36} = 6\]

107. List the like terms in this expression: \[4ab + 3x – 2a^2b – \frac{x}{y} + 3ab\]

108. \[5t^2 – 3t^2 = 2t^2\]

109. \[(2b)(b^3) = 2b^4\]

110. \[\frac{-8x^4}{-2x} = 4x^3\]

111. \[(6c – 2d + f) + (–3c + 3f) = 3c – 2d + 4f\]

112. \[(5x^2 + 3xy – y^2) – (x^2 + 5xy + 3y^2) = 4x^2 – 2xy – 4y^2\]

113. \[p(p + 2) = p^2 + 2p\]

114. \[(2a + 3)(a – 7) = 2a^2 – 11a – 21\]

115. \[\frac{abc – 3a^2b^2}{ab} = c – 3ab\]

116. Factor this expression: \[50x^2y + 70x^2z + 40x^2 = 10x^2(5y + 7z + 4)\]

117. Factor this expression: \[x^2 – 49 = (x + 7)(x – 7)\]
Book 5

118. Find the coordinates for Point A on this graph. \((3, -1)\)

119. Use graphing to find the solutions these two equations have in common: \(y = 2x - 1\) and \(y = x\). \((1, 1)\)
**Book 1**

120. What is the name of this line?  
   Line CD

121. What is the name of this angle?  
   ∠FGH or ∠HGF

122. What kind of angle is ∠ABC?  
   acute, obtuse, or right?  
   right

123. How many degrees in ∠DEF? 50°

124. How many degrees in ∠d? 132°

125. How many degrees in ∠f? 50°
126. How many degrees in $\angle C$?

$$\triangle ABC$$

- $\angle A = 60^\circ$
- $\angle B = 60^\circ$
- $\angle C = 60^\circ$

127. What kind of triangle is $\triangle XYZ$: scalene, isosceles, or equilateral?

$$\triangle XYZ$$

- $\angle X = 1^\circ$
- $\angle Y = 1^\circ$
- $\angle Z = 2^\circ$

128. How many degrees in $\angle e$?

$$\triangle def$$

- $\angle d = 130^\circ$
- $\angle e = 70^\circ$
- $\angle f = 120^\circ$

129. Label each quadrangle with one of these terms: rectangle, rhombus, trapezoid, parallelogram.

- Parallelogram
- Rhombus
- Trapezoid
- Rectangle
130. Find the perimeter of a 7-inch square. **28 inches**

131. Find the length of side AC. Use the formula: \( a^2 + b^2 = c^2 \). **5”**

132. Find the area of a rectangle that is 6 feet wide and 12 feet long. **72 square feet**

133. Find the area of this triangle. **10 square inches**

134. Find the area of this figure. **185 square inches**
135. Identify each part of the circle with one of these terms: circumference, radius, diameter, arc.

Line CD ______ radius ______
Line AB ______ diameter ______
Line BD ______ arc ______
Distance around the circle ______ circumference ______

136. Find the radius of a circle with a 10-inch diameter. ______ 5 inches ______

137. Find the circumference of a circle with a 14-inch diameter. Let \( \pi = 3\frac{1}{7} \). ______ 44 inches ______

138. Find the area of a circle with a radius of 7 inches. Let \( \pi = \frac{22}{7} \). ______ 154 square inches ______

139. Find the volume of this cube. ______ 125 cubic inches ______

140. Find the volume of this cylinder. Let \( \pi = 3.14 \). ______ 471 cubic inches ______
Mastery Checkup: Level 1

Book 1

1. How many dots are in the box?

   • • • • •

   ___ 6 ___

   Write the numbers that are left out.

2. 1, __2__, 3, __4__, 5, 6, __7__, 8, __9__

3. 10, __11__, 12, 13, __14__, __15__, 16

4. 36, __37__, __38__, 39, __40__, __41__, 42

5. 99,997, 99,998, 99,999, __100,000__

   Write the numerals for these number words.

6. five ___5________

7. forty-three ___43________

8. five hundred sixty-five ___565________

9. twelve thousand, nine hundred eighty-six ___12,986________

10. Six dollars and nine cents ___$6.09________

11. Eighty-five cents (Write this two ways.)

   ___$.85________
   ___85¢________

   Write the number words for these numerals.

12. 7 ___seven____________

13. 19 ___nineteen____________

14. $12.04 __twelve dollars and four cents__

15. 40¢ ___forty cents________

16. How many ones are in 72? ___2 ones___

17. How many tens are in 72? ___7 tens___

18. How many hundreds are in 197? __1 hundred___

   Circle the biggest number in each box:

19. ___39________

   ___81________

   ___56________

20. ___41________

   ___47________

   ___45________
Book 2

Add these numbers.

21. \[ \begin{array}{c}
4 \\
+ 3 \\
\hline
7
\end{array} \]

26. \[ \begin{array}{c}
321 \\
+ 200 \\
+ 126 \\
\hline
647
\end{array} \]

22. \[ 25 + 62 = \underline{87} \]

27. \[ 340 + 13 = \underline{353} \]

23. \[ 456 + 153 = \underline{609} \]

28. \[ 8 + 5 = \underline{13} \]

24. \[ \begin{array}{c}
2 \\
\hline
3 \\
+ 4 \\
\hline
9
\end{array} \]

29. \[ \begin{array}{c}
39 \\
\hline
+ 56 \\
\hline
95
\end{array} \]

25. \[ \begin{array}{c}
35 \\
\hline
22 \\
\hline
+ 31 \\
\hline
88
\end{array} \]

30. \[ \begin{array}{c}
467 \\
\hline
+ 326 \\
\hline
793
\end{array} \]

31. \[ \$3.25 + \$.63 + \$.89 = \underline{\$4.77} \]
Book 3

Subtract these numbers.

32. \[7 \quad - \quad 2 = 5\]

33. \[75 \quad - \quad 34 = 41\]

34. \[867 \quad - \quad 235 = 632\]

35. \[64 \quad - \quad 39 = 25\]

36. \[628 \quad - \quad 275 = 353\]

37. \[813 \quad - \quad 695 = 118\]

38. \[460 \quad - \quad 332 = 128\]

39. \[905 \quad - \quad 128 = 777\]

40. \[500 \quad - \quad 348 = 152\]

41. \[5,038 \quad - \quad 2,135 = 2,903\]

42. \[\$58.29 \quad - \quad \$3.75 = \$54.54\]
**Book 4**

Multiply these numbers.

43. \(4 \times 7 = 28\)

44. \[\begin{array}{c}
21 \\
\times 4 \\
\hline
84
\end{array}\]

45. \[\begin{array}{c}
323 \\
\times 3 \\
\hline
969
\end{array}\]

46. \[\begin{array}{c}
58 \\
\times 4 \\
\hline
232
\end{array}\]

**Book 5**

Divide these numbers.

50. \(9 \div 3 = 3\)

51. \(46 \div 2 = 23\)

52. \(963 \div 3 = 321\)

53. \(21 \div 3 = 7\)

54. \(168 \div 7 = 24\)

55. \(45 \div 15 = 3\)

56. \(369 \div 8 = 46 \text{ r} 1 \text{ (or } 46 \frac{1}{8}\text{)}\)

57. \(177 \div 32 = 5 \text{ r} 17 \text{ (or } 5 \frac{17}{32}\text{)}\)

58. \(804 \div 2 = 402\)

59. \(560 \div 10 = 56\)
Solve these word problems.

60. Leroy is planning to drive his old car to Bay City. 
   It is 120 miles away. 
   The car can go 40 miles an hour. 
   Leroy wants to know how many hours the trip will take.

   What should he do? Circle one.
   add  subtract  multiply  divide

   How many hours will the trip take? 3 hours

61. Mrs. Abrams is sending her son Alex to college. 
   Alex needs $125 for books. 
   He needs $78 for class fees. 
   He needs $100 for spending money. 
   Mrs. Abrams must figure out how much money to give Alex.

   What should she do? Circle one.
   add  subtract  multiply  divide

   How much money should Mrs. Abrams give Alex? $303

62. Luis earns $330 a week. His take-home pay is $280 a week. 
   Luis wants to figure out how much money is taken out of his paycheck for taxes.

   What should he do? Circle one.
   add  subtract  multiply  divide

   How much money is taken out for taxes? $50

63. Mali is applying for a job. 
   The pay is $9.79 an hour. 
   Mali is trying to figure out how much money she would make in a 40-hour workweek.

   What should she do? Circle one.
   add  subtract  multiply  divide

   How much money would Mali make? $391.60
### Mastery Checkup: Level 1 Referral

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Mastery Checkup: Level 2

Book 1

1. What is the numerator of the fraction $\frac{2}{3}$? _______ 2 ______
   What is the denominator of the fraction $\frac{2}{3}$? _______ 3 ______

2. Write the fraction that tells what part of each circle is shaded.
   ![Fraction Circles](image)
   \[ \frac{1}{5} \quad \frac{2}{5} \]

3. Which of these is a proper fraction? an improper fraction? a mixed number?
   \[ \frac{3}{7} \quad \text{proper fraction} \]
   \[ 2\frac{5}{8} \quad \text{mixed number} \]
   \[ \frac{15}{6} \quad \text{improper fraction} \]

4. Change $\frac{18}{7}$ into a mixed number. _______ $2\frac{4}{7}$ ______

5. Change $5\frac{3}{4}$ into an improper fraction. _______ $\frac{23}{4}$ ______

6. Make the equivalent fraction: $\frac{3}{8} = \frac{9}{24}$

Reduce each fraction below to its lowest terms.

7. $\frac{10}{18} = \frac{5}{9}$
   8. $\frac{9}{27} = \frac{1}{3}$
   9. $\frac{21}{35} = \frac{3}{5}$
   10. $\frac{160}{320} = \frac{1}{2}$

11. Which is larger: $\frac{3}{8}$ or $\frac{5}{8}$? _______ $\frac{5}{8}$ ______

12. Find a common denominator for $\frac{2}{3}$, $\frac{5}{9}$, and $\frac{7}{12}$. _______ 36 ______

13. Find a common denominator for $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{6}{7}$. _______ 105 ______

14. Which is largest: $\frac{9}{10}$, $\frac{3}{4}$, or $\frac{4}{5}$? _______ $\frac{9}{10}$ ______
From now on, reduce all fraction answers to lowest terms.
Change improper fraction answers to mixed numbers.

15. \[ \frac{7}{16} + \frac{4}{16} = \frac{11}{16} \]

16. \[ \frac{2}{3} + \frac{3}{4} = 1\frac{5}{12} \]

17. \[ \frac{2}{9} + 7\frac{3}{9} = 9\frac{5}{9} \]

18. \[ 1\frac{3}{4} + 2\frac{3}{4} = 4\frac{1}{2} \]

19. \[ 6\frac{3}{4} + 2\frac{3}{8} = 9\frac{3}{8} \]

20. \[ \frac{9}{10} - \frac{3}{10} = \frac{3}{5} \]

21. \[ \frac{5}{8} - \frac{1}{3} = \frac{7}{24} \]

22. \[ 5\frac{3}{4} - 2\frac{1}{4} = 3\frac{1}{2} \]

23. \[ 6\frac{2}{3} - \frac{1}{2} = 6\frac{1}{6} \]

24. \[ 8\frac{1}{3} - 5\frac{2}{3} = 2\frac{2}{3} \]

25. \[ 9\frac{3}{16} - 8\frac{3}{8} = \frac{13}{16} \]
Book 3

26. \( \frac{1}{3} \times \frac{5}{6} = \frac{5}{18} \)

27. \( 5 \times \frac{3}{4} = 3 \frac{3}{4} \)

28. \( \frac{\frac{9}{21}}{3} \times \frac{\frac{6}{18}}{2} = \frac{1}{6} \)

29. \* \( 3 \frac{1}{3} \times 1 \frac{2}{23} = \frac{2}{\frac{2}{3}} \times \frac{9}{\frac{28}{3}} = \frac{18}{5} = 3 \frac{3}{5} \)

30. \( \frac{3}{4} \div \frac{1}{3} = 2 \frac{1}{4} \)

31. \( 7 \frac{1}{2} \div 2 \frac{1}{3} = 3 \frac{3}{14} \)

* Student should cancel before multiplying in questions 28 and 29.
32. Write four tenths as a decimal. \( .4 \)

33. Write sixteen thousandths as a decimal. \( .016 \)

34. Check the correct answer:
   \[
   .02 = \quad \text{two tenths} \\
   \checkmark \quad \text{two hundredths} \\
   \quad \text{two thousandths}
   \]

35. Write sixty-one and one-tenth as a mixed decimal. \( 61.1 \)

36. Check the correct answer:
   \[
   20.21 = \quad \checkmark \quad \text{twenty and twenty-one hundredths} \\
   \quad \text{twenty thousand and twenty-one} \\
   \quad \text{twenty and twenty-one thousandths}
   \]

37. \( 7 + 15.75 + .006 + 4.3 = 27.056 \)

38. \( 35.092 - 7.6 = 27.492 \)

39. \( 1.33 \times .9 = 1.197 \)

40. \( .32 \times 1,000 = 320 \)

41. \( 35.7 \div 7 = 5.1 \)

42. \( 45 \div .9 = 50 \)

43. \( .036 \div .03 = 1.2 \)

44. \( .32 \div 1,000 = .00032 \)

45. Round off .72 to the nearest tenth. \( .7 \)

46. Change \( \frac{1}{2} \) into a decimal. \( .5 \)
47. Write 3 out of 100 as a percent. \( \frac{3}{100} \)  

48. Write 75% as a fraction. \( \frac{3}{4} \)

49. Change \( \frac{9}{10} \) to a percent. \( 90\% \)

50. Write 3% as a decimal. \( 0.03 \)

51. Change .01 into a percent. \( 1\% \)

52. What percent of 300 is 60? \( 20\% \)

53. What is 40% of 480? \( 192 \)

54. 54 is 30% of what number? \( 180 \)

55. For each question below, circle the word that tells which fact is missing.
   a. What is 10% of $50? part whole percent
   b. What percent is $10 of $50? part whole percent
   c. $10 is 50% of what amount? part whole percent

56. $200 is 125% of what amount? $160

57. What is \( \frac{1}{8} \) of 800? \( 1 \)

58. The regular price was $425.
   The sale price is $374.
   What is the percent of decrease? \( 12\% \)

59. What is $30 increased by 15%? \( $34.50 \)

60. The current price is $62.40.
   This is 4% more than the old price.
   What was the old price? \( $60.00 \)
Book 6

Solve these word problems.

61. Alain’s store had a 15 percent drop in sales this year. He made $205,000 last year. How much did he make this year? $174,250

62. There are 333 Junk-Quick fast-food stands across the country now. Next year, $\frac{1}{3}$ of them are closing. How many Junk-Quick stands are closing? 111 stands

63. Yao kept track of how much money he spent on gas for his car.
   Week 1  $25
   Week 2  $28.75
   Week 3  $26.30
   Week 4  $31.50
   Week 5  $27.25
   What is the average amount Yao spends per week on gas? $27.76

In the next two questions, write down what steps you must take to solve the problem. For instance, you might have to add and then divide.

64. Samira buys $3 \frac{1}{2}$ yards of rubber tubing at $\$.80$ a yard. There is a 4 percent sales tax. How much did Samira pay in all?
   Step 1. Multiply $3 \frac{1}{2}$ by $\$.80$
   Step 2. Multiply step 1 answer by 104%
   How much did Samira pay? (Round off answer to nearest cent.) $2.91$

65. The weather report said that 4 inches of rain fell in July. Last July, 2.9 inches fell. What was the percent of increase from last year?
   Step 1. Subtract 2.9 from 4
   Step 2. Find percent step 1 answer is of 2.9
   What was the percent of increase? (Round off answer to nearest whole percent.) 38% more rain
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**Book 2, chapters:**

| 15                           | 1                          |
| 16                           | 3                          |
| 17–19                        | 4                          |
| 20                           | 6                          |
| 21                           | 7                          |
| 22                           | 8                          |
| 23                           | 9                          |
| 24                           | 10                         |
| 25                           | 11                         |

**Book 3, chapters:**

| 26 or 27                     | 1                          |
| 28                           | 2                          |
| 29                           | 4                          |
| 30                           | 5                          |
| 31                           | 6                          |

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**Book 5, chapters:**

| 47 or 48                     | 1                          |
| 49                          | 2                          |
| 50                          | 3                          |
| 51                          | 4                          |
| 52                          | 6                          |
| 53                          | 7                          |
| 54                          | 9                          |
| 55                          | 10                         |
| 56                          | 11                         |
| 57                          | 12                         |
| 58                          | 13                         |
| 59                          | 14                         |
| 60                          | 15                         |

**Book 6, chapters:**

| 61–65                       | 1–3                         |
Mastery Checkup: Level 3

Book 1

1. What number does the long line stand for? ______1_____
   (Each line stands for one whole number.)

   ________
   0

2. –4
   + –2
   ———
   –6

3. –75
   + 55
   ———
   –20

4. (–8) + (–9) + (5) + (6) + (–1) = ______–7_____

5. –81
   – (–11)
   ———
   –70

6. (–10) – (–2) – (–5) = ______–7_____

7. (–8)(–5) = ______40_____

8. (14)(–4) = ______–56_____

9. (11)(–5)(3) = ______–165_____

10. \(-\frac{16}{4}\) = ______4_____

11. \(-\frac{125}{5}\) = ______–25_____

12. 3(2 – 4) + \(\frac{30}{6}\) = ______–11_____

46  Mastery Checkup: Level 3
Book 2

13. What does this expression mean in words: $\frac{a}{b}$ _____ one number divided by another number _____

14. Write an algebraic expression for these words:
   One number added to another number. ______ $x + y$ ______

15. Evaluate $\frac{a}{b}$ when $a = 30$ and $b = 5$. _____ 6 _____

16. Evaluate $3(x + y)$ when $x = 2$ and $y = 3$. ____ 15 ____

17. If $5t = 20$, then $t = ____ 4 ____$

18. If $25 = 2x - 5$, then $x = ____ 15 ____$

Combine the variables in 19–21.

19. $8x + 2x = ____ 10x ____$

20. $12n - n = ____ 11n ____$

21. $7(6y) = ____ 42y ____$

22. If $3x - x + 10 = 14$, then $x = ____ 2 ____$

23. If $8(x + 1) = 4x$, then $x = ____ -2 ____$

24. If $x - y = a$, then $x = ____ a + y ____$
Solve these word problems.

25. George drove 50 miles per hour for 12 hours.
   How far did he drive?
   Use the formula: \( d = rt \).
   
   \[ 600 \text{ miles} \]

26. The temperature on a summer day is 30 degrees Celsius.
   What is the temperature in degrees Fahrenheit?
   Use the formula: \( F = \frac{9}{5}C + 32 \).
   
   \[ 86^\circ \]

27. Micah bought a bike on sale for $160.
   That was 20% off the original price.
   What was the original price?
   
   \[ 200 \]

   He won 25 games.
   What is the ratio of games lost to games won?
   Reduce your answer.
   
   \[ \frac{5}{25} = \frac{1}{5} \text{ or } 1:5 \]

29. A maple tree is 30 feet high and casts a shadow 15 feet long.
   An apple tree right next to it casts an 8-foot shadow.
   How high is the apple tree?
   
   \[ 16 \text{ feet} \]

30. A power lawn mower runs on a mixture of oil and gas.
   For every \( \frac{1}{2} \) quart of oil, it takes 2 gallons of gas.
   If you are mixing up a big batch at a time and you use 6 gallons of gas,
   how many quarts of oil will you need?
   
   \[ 1\frac{1}{2} \text{ quarts} \]
31. List the factors of 50.
   1, 2, 5, 10, 25, 50

32. List the factors of –25.
   ±1, ±5, ±25

33. $6^1 = 216$

34. $\sqrt{\frac{16}{25}} = \frac{4}{5}$

35. Estimate $\sqrt{55}$ to the nearest tenth. = 7.4

36. List the terms in this expression:
   $a^2 b + xy + ab + ax + xy^2$
   $a^2b, xy, ab, ax, xy^2$

37. List the like terms in this expression:
   $2xy^2 + 3y + 2x + xy^2$
   $2xy^2, xy^2$

38. $8f^2 + 3f^2 + f^2 = 12f^2$

39. $4ab^2 - (-7ab^2) = 11ab^2$

40. $(a)(3a^3) = 3a^6$

41. $(3xy^2)(2x^2) = 6x^3y^2$

42. $\frac{10a^2b^3c}{5a^2b} = 2b^2c$

43. $\frac{10ac^4}{-10ac^4} = -1$

44. $(-5p + 4r^2) + (8p - 2r^2) + (2p - 8r^2) = 5p - 6r^2$

45. $(5a^2 - 4b + 8) - (-2a^2 - 4b + 10) = 7a^2 - 2$

46. $c(10a + c + 8) = 10ac + c^2 + 8c$

47. $(6m^2 - 4m)(2m + 2) = 12m^3 + 4m^2 - 8m$

48. $\frac{12x^3 - 24xy}{6x} = 2x^2 - 4y$

49. Factor this expression: $a^2b - ab^2 + ab^3$
   $ab(a - b + b^2)$

50.* $(3a - b)(3a + b) = 9a^2 - b^2$

51. Factor this expression: $25a^2 - 100b^2$
   $(5a - 10b)(5a + 10b)$

* In question 50, student should use shortcut of simply squaring both terms rather than multiplying the whole thing out.
Find the coordinates for the points on this graph below.

52. Point $A = (0, 2)$

53. Point $B = (-2, -2)$

54. Point $C (3, -2)$

55. Point $D (-1, 0)$

56. Plot this equation on the graph below:
   $y = 2x - 3$

57. Solve these two equations using graphing:
   $y = \frac{1}{2}x$, and $y = x$

Solution $(0, 0)$
### Mastery Checkup: Level 3 Referral

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#### Book 3, chapters:

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| 29                |            |  
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#### Book 5, chapters:

| 52 or 53          |            |  
| 54 or 55          |            |  
| 56                |            |  
| 57                |            |
1. What is the name of this line?

   A
   \[\text{Line } AB\]
   B

2. What is the relationship of these two lines?

   \[\text{parallel}\]

3. a. What is the name of this angle?

   \[\angle BAC \text{ or } \angle CAB\]

   A
   \[\text{}\]
   B
   \[\text{}\]
   C

   b. How many degrees are in this angle? (Use a protractor.)

   \[25^\circ\]

4. \[\text{right}\]

5. \[\text{obtuse}\]

6. \[\text{acute}\]

7. How many degrees does \(\angle ZYA\) have?

   X
   \[\text{35}^\circ\]
   Y
   Z
   \[\text{145}^\circ\]
   A

8. How many degrees does \(\angle ABD\) have?

   A
   B
   \[\text{30}^\circ\]
   C
   \[\text{60}^\circ\]
   D

Use this figure to answer questions 9 and 10.

9. Name the pairs of vertical angles.

   x
   y
   \[\angle x, \angle z\]
   a
   \[\angle y, \angle a\]

10. How many degrees does \(\angle x\) have? \(42^\circ\)

Use this figure to answer questions 11 and 12.

11. Name the pairs of corresponding angles.

   m
   \[\angle m, \angle r\]
   n
   \[\angle n, \angle s\]
   o
   \[\angle o, \angle t\]
   p
   \[\angle p, \angle w\]

12. How many degrees does \(\angle p\) have? \(150^\circ\)

   How many degrees does \(\angle n\) have? \(30^\circ\)
13. How many degrees does $\angle c$ have? 15°

14. What kind of triangle is $\triangle CDE$: right, acute, or obtuse? right

15. What kind of triangle has no equal sides? scalene

16. How many degrees does $\angle a$ have? 30°

17. Label each quadrangle with one of these terms: square, rhombus, trapezoid, parallelogram.

  square    rhombus    trapezoid    parallelogram
18. Find the perimeter of a rug that is 12 feet long and 10 feet wide.

\[44 \text{ feet}\]

19. Find the perimeter of this triangle.

\[28''\]

20. Find the length of side \(AB\).

\[6''\]

21. Find the area of a 10-inch square.

\[100 \text{ square inches}\]

22. Find the area of this triangle.

\[6 \text{ square feet}\]

23. Find the area of this parallelogram.

\[240 \text{ square inches}\]

24. Find the area of this figure.

\[80 \text{ square feet}\]
25. Identify each part of the circle with one of these terms: diameter, arc, radius, circumference, chord.

- Line $MO$  diameter
- Line $NP$  radius
- Line $RS$  chord
- Line $OP$  arc

26. Find the diameter of a circle with an 8-inch radius. **16 inches**

27. Find the circumference of a circle with a 28-inch diameter. Let $\pi = \frac{22}{7}$. **88 inches**

28. Find the area of this circle. Let $\pi = 3.14$. **314 square inches**

29. Find the volume of a 6-inch cube. **216 cubic inches**

30. Find the volume of this cylinder. Let $\pi = 3.14$. **678.24 cubic inches**

31. Find the volume of this box. **1,440 cubic inches**
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# Student Profile

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**Level 1 Book 2: Adding Whole Numbers**

<p>| 11, 12, 13                    | Adding without carrying |  |
|                               | Adding two 1-place numbers | 21 |
|                               | Adding two 2-place numbers | 22 |
|                               | Adding two 3- or 4-place numbers | 23 |
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| 14, 15, 16                    | Adding with carrying |  |
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<td>(finding a percent of a number)</td>
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