Breakthrough to Math

LEVELS 1 2 3 4

TEACHER'S DIRECTORY

New Readers Press
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by Stephanie Irwin

Breakthrough to Math Levels 1, 2, 3, 4
Teacher's Directory

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Placement Inventory

Placement Inventory developed by Rowan College (formerly Glassboro State College) in cooperation with the New Jersey State Department of Education, Division of School Programs, Bureau of Adult Continuing Education. Materials do not necessarily reflect the policy of the New Jersey State Department of Education and no official endorsement should be inferred.

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Table of Contents

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.

Breakthrough to Math was designed to be flexible to suit students and teachers with varying levels of math skills in a variety of teaching situations. You are the best judge of what will work for you and your students and how this series can be adapted to meet your needs. So, help yourself! We hope you and your students enjoy the sense of accomplishment that can be achieved when people are allowed to work at their own speed and without pressure.

Ann K.U. Tussing
Series Editor

* 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

Book 2: Adding Whole Numbers

Book 3. Subtracting Whole Numbers

Book 4. Multiplying Whole Numbers

Book 5. Dividing Whole Numbers

Locator

Name _____

Date _____

1. $\begin{array}{r} 5 \\ +\ 4 \\ \hline \end{array}$

2. $\begin{array}{r} 17 \\ +\ 28 \\ \hline \end{array}$

3. $\begin{array}{r} 9 \\ -\ 5 \\ \hline \end{array}$

4. $\begin{array}{r} 55 \\ -\ 36 \\ \hline \end{array}$

5. $\begin{array}{r} 8 \\ \times\ 3 \\ \hline \end{array}$

6. $\begin{array}{r} 29 \\ \times\ 5 \\ \hline \end{array}$

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.

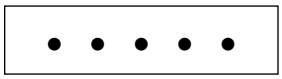
If the student successfully completes questions 34–80, administer the next section of the Placement Inventory, questions 81–119.

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.

Book 1

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 = 467

12.
$$\begin{array}{r} 201 \\ 614 \\ +\ 121 \\ \hline 936 \end{array}$$

13. 253 + 13 = 266

14.
$$\begin{array}{r} 38 \\ +\ 45 \\ \hline 83 \end{array}$$

15.
$$\begin{array}{r} 489 \\ +\ 313 \\ \hline 802 \end{array}$$

16. $1.23 + $3.42 + $.75 = $5.40

Book 3

Subtract these numbers.

17.
$$\begin{array}{r} 68 \\ -\ 42 \\ \hline 26 \end{array}$$

18.
$$\begin{array}{r} 895 \\ -\ 453 \\ \hline 442 \end{array}$$

19.
$$\begin{array}{r} 73 \\ -\ 58 \\ \hline 15 \end{array}$$

20.
$$\begin{array}{r} 427 \\ -\ 192 \\ \hline 235 \end{array}$$

21.
$$\begin{array}{r} 712 \\ -\ 356 \\ \hline 356 \end{array}$$

22.
$$\begin{array}{r} \$32.00 \\ -\ 4.89 \\ \hline \$27.11 \end{array}$$

Book 4

Multiply these numbers.

23. $\begin{array}{r} 23 \\ \times\ 2 \\ \hline 46 \end{array}$

24. $\begin{array}{r} 312 \\ \times\ 2 \\ \hline 624 \end{array}$

25. $\begin{array}{r} 695 \\ \times\ 8 \\ \hline 5{,}560 \end{array}$

26. $\begin{array}{r} 57 \\ \times\ 13 \\ \hline 741 \end{array}$

27. $\begin{array}{r} 257 \\ \times\ 42 \\ \hline 10{,}794 \end{array}$

Book 5

Divide these numbers.

28. $48 \div 4 =$ 12

29. $768 \div 8 =$ 96

30. $98 \div 14 =$ 7

31. $715 \div 18=$ 39 r13

32. $803 \div 4 =$ 200 r3

33. $130 \div 10 =$ 13

Book 6

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

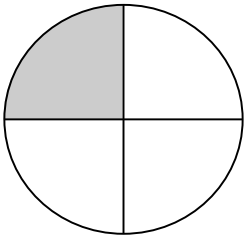
37. Carla goes to an auto supply store.
She finds an air filter for $9.98.
She finds a can of oil for $4.93.
She finds an oil filter for $6.50.
Carla wants to figure out how much these items will cost altogether.
What should she do? Circle one.

(add) subtract multiply divide

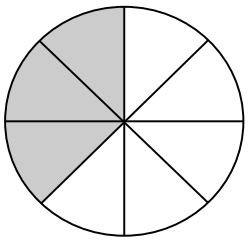
How much will the items cost altogether? $21.41

Book 1

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



$\frac{1}{4}$



$\frac{3}{8}$

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. $\frac{5}{9} - \frac{1}{3} = \frac{2}{9}$

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

50. $5\frac{1}{8} - 2\frac{3}{4} = 2\frac{3}{8}$

Book 3

51. $\frac{3}{7} \times 3 =$ $1\frac{2}{7}$

52.* $\frac{\cancel{13}}{\cancel{15}_{3}} \times \frac{\cancel{5}^{1}}{9} =$ $\frac{13}{27}$

53.* $4\frac{2}{3} \times 1\frac{2}{7} =$ $\frac{\cancel{14}^{2}}{\cancel{3}_{1}} \times \frac{\cancel{9}^{3}}{\cancel{7}_{1}} = \frac{6}{1} = 6$

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 =
    ✓ three and six-thousandths
    _____ three thousand and six
    _____ three and six-hundredths

58. .2 + 29 + 6.8 + .001 = 36.001

59. 6.031 – .9 = 5.131

60. 7.01 × .02 = .1402

61. .0035 ÷ .05 = .07

62. Round off .88 to the nearest tenth. .9

63. Change $\frac{1}{5}$ into a decimal. .2

Book 5

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. .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

Book 6

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 $4\frac{1}{4}$ hours on Monday, $4\frac{3}{4}$ hours on Tuesday, and $5\frac{1}{4}$ 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.

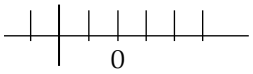
Step 2. Find what percent step 1 answer (part) is of $770 (whole).

What percent was the couch marked down?
(Round off your answer to the nearest percent.) 20%

Book 1

81. What number does the long line stand for? -2

(Each line stands for one whole number.)



82. $(-3) + (-5) = -8$

83. $\begin{array}{r} 13 \\ +\ -8 \\ \hline 5 \end{array}$

84. $(-8) + (7) + (-9) = -10$

85. $\begin{array}{r} 5 \\ -\ -5 \\ \hline 10 \end{array}$

86. $(10) - (5) - (-2) = 7$

87. $(-12)(-4) = 48$

88. $(-3)(5)(6) = -90$

89. $\frac{36}{-12} = -3$

90. $2(5 + 2) - \frac{20}{5} = 10$

Book 2

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.

Book 4

104. List the factors of –36. $\pm1, \pm2, \pm3, \pm4, \pm6, \pm9, \pm12, \pm18, \pm36$

105. $4^3 =$ 64

106. $\sqrt{36} =$ 6

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

108. $5t^2 - 3t^2 =$ $2t^2$

109. $(2b)(b^2) =$ $2b^3$

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. $(2a + 3)(a - 7) =$ $2a^2 - 11a - 21$

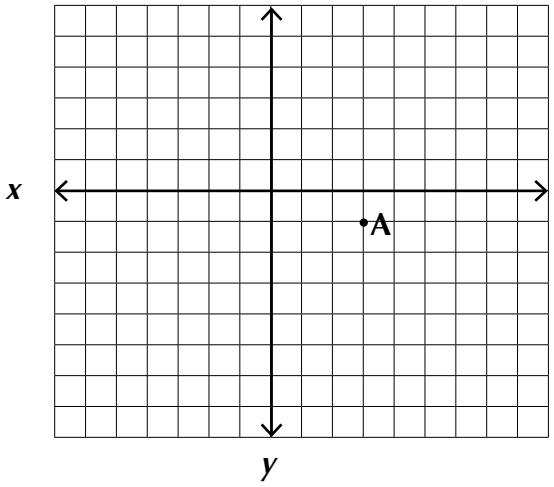
115. $\frac{abc - 3a^2b^2}{ab} =$ $c - 3ab$

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

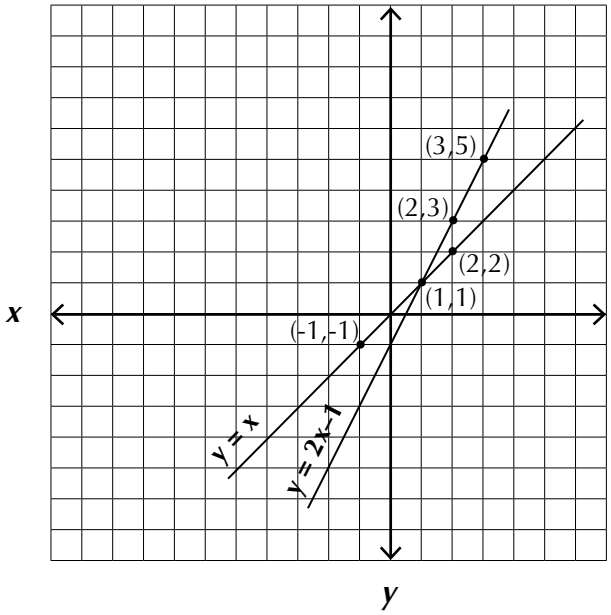
117. Factor this expression: $x^2 - 49 =$ $(x + 7)(x - 7)$

Book 5

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



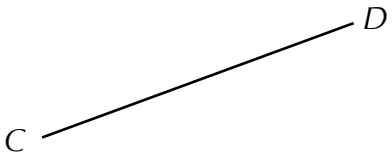
119. Use graphing to find the solutions these two equations have in common: $y = 2x - 1$ and $y = x$. (1, 1)



Book 1

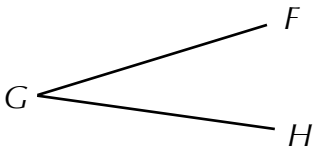
120. What is the name of this line?

Line CD



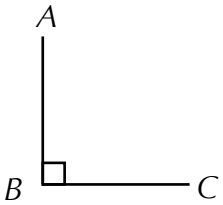
121. What is the name of this angle?

∠FGH or ∠HGF

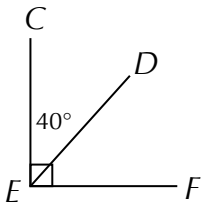


122. What kind of angle is $\angle ABC$?
acute, obtuse, or right?

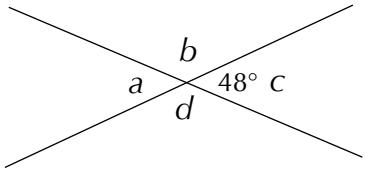
right



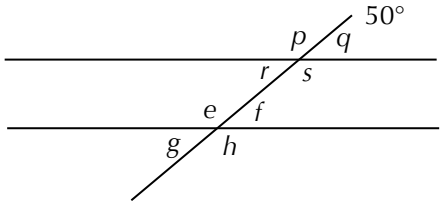
123. How many degrees in $\angle DEF$? 50°



124. How many degrees in $\angle d$? 132°



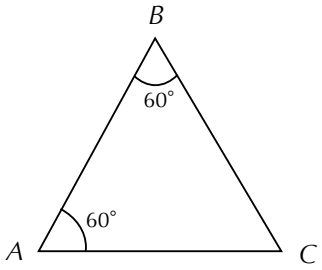
125. How many degrees in $\angle f$? 50°



Book 2

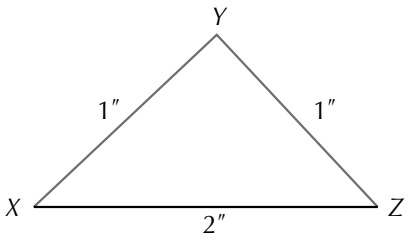
126. How many degrees in $\angle C$?

60°

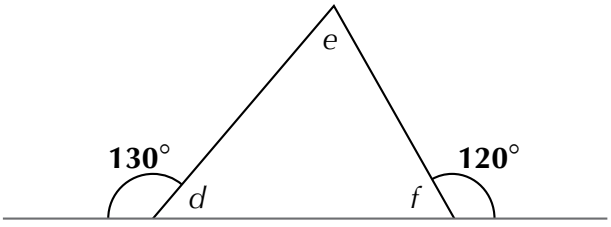


127. What kind of triangle is ΔXYZ: scalene, isosceles, or equilateral?

isosceles

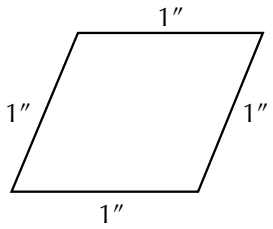


128. How many degrees in $\angle e$? 70°



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

parallelogram



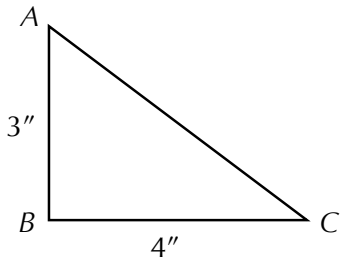
rhombus

trapezoid

rectangle

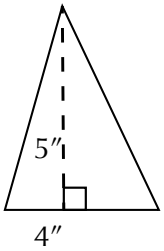
130. Find the perimeter of a 7-inch square. 28 inches

131. Find the length of side *AC*. Use the formula: $a^2 + b^2 = c^2$. 5″

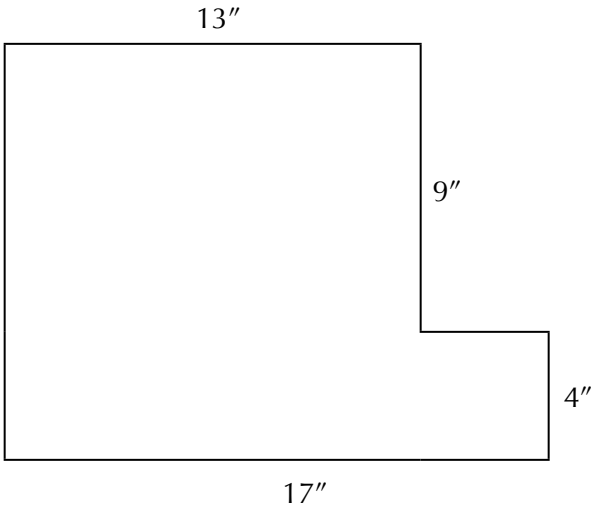


132. Find the area of a rectangle that is 6 feet wide and 12 feet long. 72 square feet

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



134. Find the area of this figure. 185 square inches



Book 3

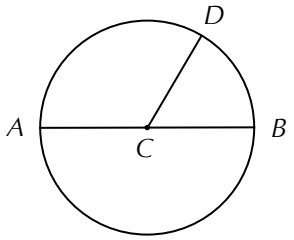
135. Identify each part of the circle with one of these terms: circumference, radius, diameter, arc.

Line *CD* radius

Line *AB* diameter

Line *BD* arc

Distance around the circle circumference

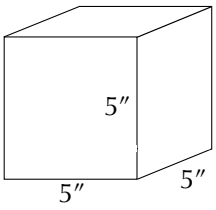


136. Find the radius of a circle with a 10-inch diameter. 5 inches

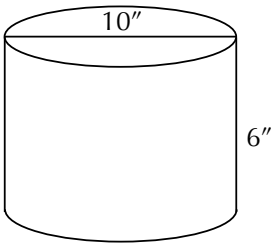
137. Find the circumference of a circle with a 14-inch diameter. Let $\pi = 3\frac{1}{7}$. 44 inches

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



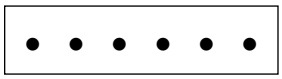
140. Find the volume of this cylinder. Let $\pi = 3.14$. 471 cubic inches



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.
$$\begin{array}{r} 4 \\ +\ 3 \\ \hline 7 \end{array}$$

22. 25 + 62 = 87

23. 456 + 153 = 609

24.
$$\begin{array}{r} 2 \\ 3 \\ +\ 4 \\ \hline 9 \end{array}$$

25.
$$\begin{array}{r} 35 \\ 22 \\ +\ 31 \\ \hline 88 \end{array}$$

26.
$$\begin{array}{r} 321 \\ 200 \\ +\ 126 \\ \hline 647 \end{array}$$

27. 340 + 13 = 353

28. 8 + 5 = 13

29.
$$\begin{array}{r} 39 \\ +\ 56 \\ \hline 95 \end{array}$$

30.
$$\begin{array}{r} 467 \\ +\ 326 \\ \hline 793 \end{array}$$

31. $3.25 + $.63 + $.89 = $4.77

Book 3

Subtract these numbers.

32. 7 − 2 = 5

33. 75 − 34 = 41

34. 867 − 235 = 632

35. 64 − 39 = 25

36. 628 − 275 = 353

37. 813 − 695 = 118

38. 460 − 332 = 128

39. 905 − 128 = 777

40. 500 − 348 = 152

41. 5,038 − 2,135 = 2,903

42. $58.29 – $3.75 = $54.54

Book 4

Multiply these numbers.

43. $4 \times 7 =$ 28

44.
$$\begin{array}{r} 21 \\ \times\ 4 \\ \hline 84 \end{array}$$

45.
$$\begin{array}{r} 323 \\ \times\ 3 \\ \hline 969 \end{array}$$

46.
$$\begin{array}{r} 58 \\ \times\ 4 \\ \hline 232 \end{array}$$

47.
$$\begin{array}{r} 785 \\ \times\ 6 \\ \hline 4{,}710 \end{array}$$

48.
$$\begin{array}{r} 43 \\ \times\ 13 \\ \hline 559 \end{array}$$

49.
$$\begin{array}{r} 328 \\ \times\ 52 \\ \hline 17{,}056 \end{array}$$

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 r1 (or $46\frac{1}{8}$)

57. $177 \div 32 =$ 5 r17 (or $5\frac{17}{32}$)

58. $804 \div 2 =$ 402

59. $560 \div 10 =$ 56

Book 6

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

If you missed this question:	go back to Book 1, chapters:
1	1
2	3
3	4
4	5
5	9–11
6	2
7	4,5
8	9
9	10
10 or 11	12
12	2
13	4, 5
14 or 15	12
16 or 17	4, 5
18	9–11
19	7
20	8
	Book 2, chapters:
21	1
22	2
23	4, 5
24	6, 7
25	8
26	9
27	10
28	11
29	12
30	13
31	14
32	1, 2
33	3
34	5
35	6
36	7
37	8
38	9
39	10
40	11
41	12
42	13
	Book 4, chapters:
43	1
44	2
45	3, 4
46	5
47	7
48 or 49	8
	Book 5, chapters:
50	1
51	2
52	3
53	4
54	5
55	7
56 or 57	8
58 or 59	9
	Book 6, chapters:
60–63	1–5

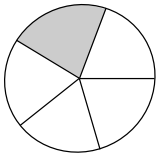
Mastery Checkup: Level 2

Book 1

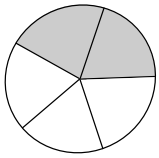
1. What is the numerator of the fraction $\frac{2}{3}$? 2

   What is the denominator of the fraction $\frac{2}{3}$? 3

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



$\frac{1}{5}$



$\frac{2}{5}$

3. Which of these is a proper fraction? an improper fraction? a mixed number?

   $\frac{3}{7}$ proper fraction

   $2\frac{5}{8}$ mixed number

   $\frac{15}{6}$ 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 $\frac{2}{3}$, $\frac{3}{5}$, and $\frac{6}{7}$. 105

14. Which is largest: $\frac{9}{10}$, $\frac{3}{4}$, or $\frac{4}{5}$? $\frac{9}{10}$

Book 2

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. $2\frac{2}{9} + 7\frac{3}{9} = 9\frac{5}{9}$

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

19. $6\frac{3}{4} + 2\frac{5}{8} = 9\frac{3}{8}$

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.* $\frac{\overset{1}{\cancel{9}}}{\underset{3}{\cancel{21}}} \times \frac{\overset{1}{\cancel{7}}}{\underset{2}{\cancel{18}}} = \frac{1}{6}$

29.* $3\frac{1}{3} \times 1\frac{2}{25} = \frac{\overset{2}{\cancel{10}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{9}{\cancel{27}}}{\underset{5}{\cancel{25}}} = \frac{18}{5} = 3\frac{3}{5}$

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.

Book 4

32. Write *four tenths* as a decimal. ____.4____

33. Write *sixteen thousandths* as a decimal. _____.016__

34. Check the correct answer:

    .02 = _____ two tenths

    ____✓____ two hundredths

    _____ two thousandths

35. Write *sixty-one and one-tenth* as a mixed decimal. ____61.1____

36. Check the correct answer:

    20.21 = ____✓____ twenty and twenty-one hundredths

    _____ twenty thousand and twenty-one

    _____ twenty and twenty-one thousandths

37. 7 + 15.75 + .006 + 4.3 = __27.056__

38. 35.092 – 7.6 = __27.492__

39. 1.33 × .9 = ___1.197___

40. .32 × 1,000 = ___320___

41. 35.7 ÷ 7 = ____5.1____

42. 45 ÷ .9 = ____50____

43. .036 ÷ .03 = ___1.2____

44. .32 ÷ 1,000 = __.00032__

45. Round off .72 to the nearest tenth. _____.7_____

46. Change $\frac{1}{2}$ into a decimal. _____.5_____

Book 5

47. Write *3 out of 100* as a percent. 3%

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

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

50. Write 3% as a decimal. .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

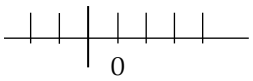
If you missed this question:	go back to Book 1, chapters:
1 or 2	1
3	3
4	5
5	6
6	7
7–10	8
11–13	9
14	10
	Book 2, chapters:
15	1
16	3
17–19	4
20	6
21	7
22	8
23	9
24	10
25	11
	Book 3, chapters:
26 or 27	1
28	2
29	4
30	5
31	6

If you missed this question:	go back to Book 4, chapters:
32–34	1
35 or 36	2
37	3
38	6
39	7
40	8
41	9
42	10
43	11
44	12
45	13
46	14
	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.)



2. $\begin{array}{r} -4 \\ +\ -2 \\ \hline -6 \end{array}$

3. $\begin{array}{r} -75 \\ +\ 55 \\ \hline -20 \end{array}$

4. $(-8) + (-9) + (5) + (6) + (-1) =$ ___−7___

5. $\begin{array}{r} -81 \\ -\ -11 \\ \hline -70 \end{array}$

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___

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

Book 3

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 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°

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

$200

28. John played 30 games of table tennis.
He won 25 games.
What is the ratio of games lost to games won?
Reduce your answer.

$\frac{5}{25} = \frac{1}{5}$ 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 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?

$1\frac{1}{2}$ quarts

Book 4

31. List the factors of 50.

1, 2, 5, 10, 25, 50

32. List the factors of –25.

±1, ±5, ±25

33. $6^3 =$ 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:
$a^2b + xy + ab + ax + xy^2$

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. $(a)(3a^5) =$ $3a^6$

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

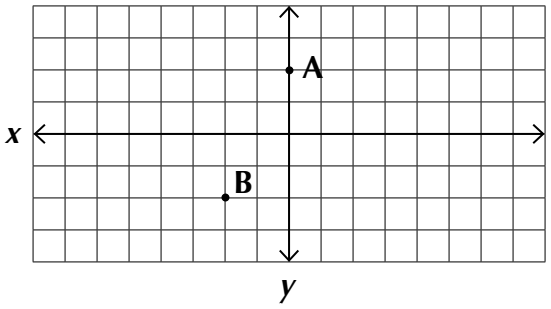
51. Factor this expression: $25a^2 - 100b^2$

$(5a - 10b)(5a + 10b)$

* In question 50, student should use shortcut of simply squaring both terms rather than multiplying the whole thing out.

Book 5

Find the coordinates for the points on this graph below.



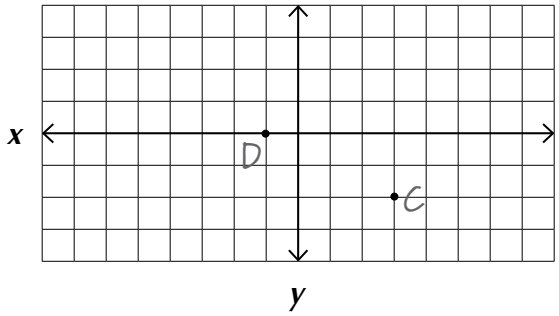
52. Point A = (0, 2)

53. Point B = (−2, −2)

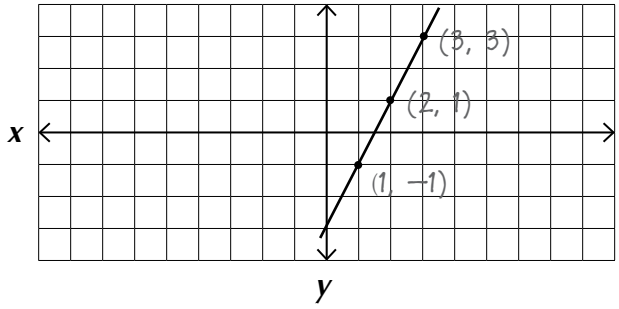
Plot these points on the graph and label them.

54. Point C (3, –2)

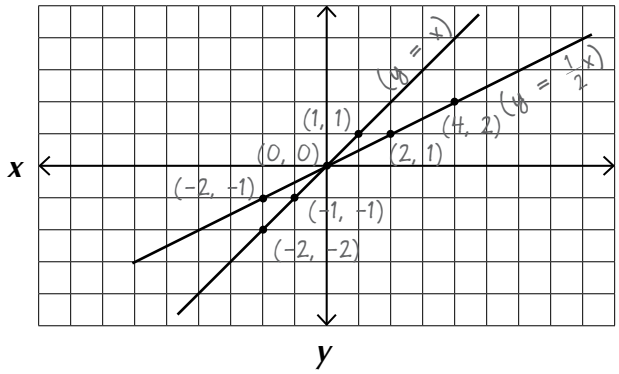
55. Point D (–1, 0)



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)

If you missed this question:	go back to Book 1, chapters:
1	1
2	3
3	5
4	6
5	7
6	8
7 or 8	9
9	10
10 or 11	11
12	12
	Book 2, chapters:
13 or 14	1
15	3
16	4
17	6
18	7
19–21	8
22	9
23	10
24	11
	Book 3, chapters:
25 or 26	1
27	2
28	5
29	6
30	7

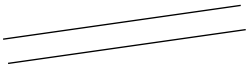
If you missed this question:	go back to Book 4, chapters:
31 or 32	1
33	2
34 or 35	3
36 or 37	5
38 or 39	6
40 or 41	8
42 or 43	9
44	10
45	11
46	12
47	13
48	14
49	15
50	16
51	17
	Book 5, chapters:
52 or 53	1, 2
54 or 55	4
56	6
57	7

Book 1

1. What is the name of this line?

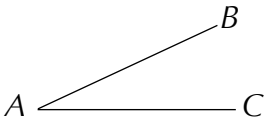
Line AB

2. What is the relationship of these two lines?



parallel

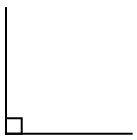
3. a. What is the name of this angle?



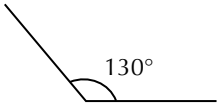
∠BAC or ∠CAB

b. How many degrees are in this angle? (Use a protractor.) 25°

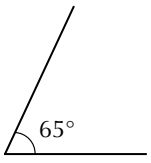
Identify each of the angles in questions 4–6 with one of these terms:
right, acute, reflex, straight, or obtuse

4. 

right

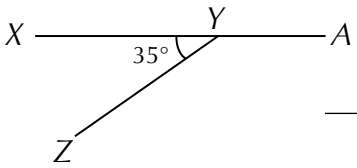
5. 

obtuse

6. 

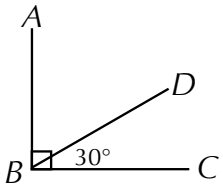
acute

7. How many degrees does ∠*ZYA* have?



145°

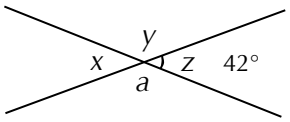
8. How many degrees does ∠*ABD* have?



60°

Use this figure to answer questions 9 and 10.

9. Name the pairs of vertical angles.

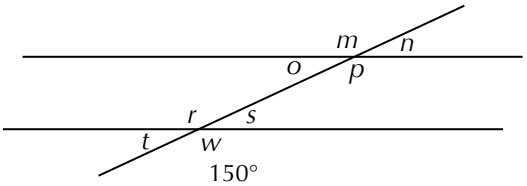


∠x, ∠z

∠y, ∠a

10. How many degrees does ∠*x* have? 42°

Use this figure to answer questions 11 and 12.



11. Name the pairs of corresponding angles.

∠m, ∠r ∠n, ∠s

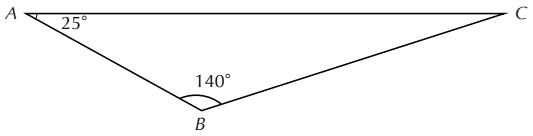
∠o, ∠t ∠p, ∠w

12. How many degrees does ∠*p* have? 150°

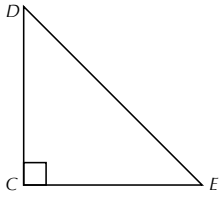
How many degrees does ∠*n* have? 30°

Book 2

13. How many degrees does ∠*c* have? 15°

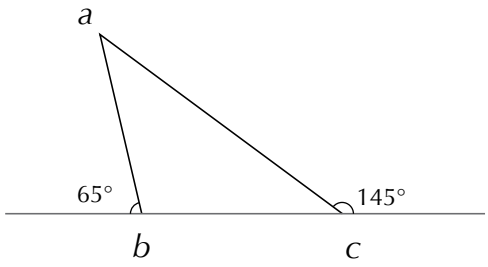


14. What kind of triangle is Δ*CDE*: right, acute, or obtuse? right

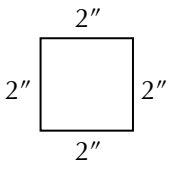


15. What kind of triangle has no equal sides? scalene

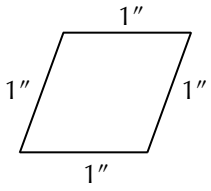
16. How many degrees does ∠*a* have? 30°



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

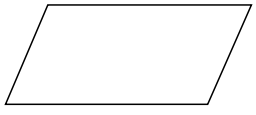


square



rhombus

trapezoid

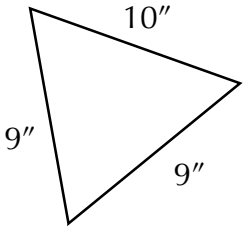


parallelogram

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

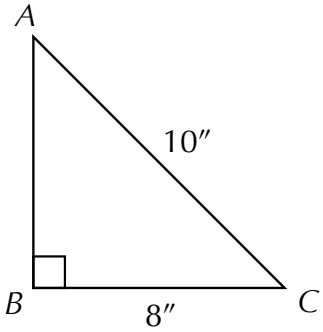
44 feet

19. Find the perimeter of this triangle.



28″

20. Find the length of side *AB*.

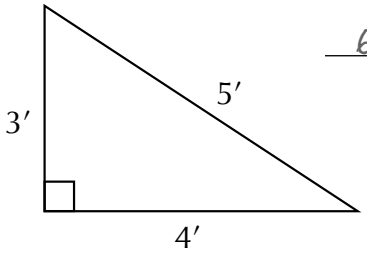


6″

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

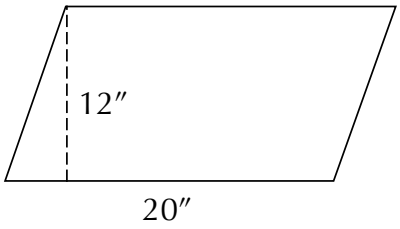
100 square inches

22. Find the area of this triangle.



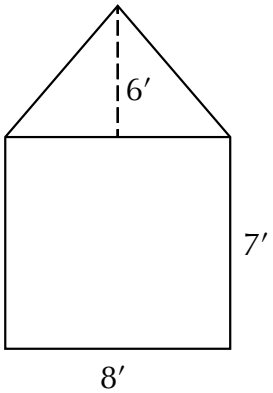
6 square feet

23. Find the area of this parallelogram.



240 square inches

24. Find the area of this figure.



80 square feet

Book 3

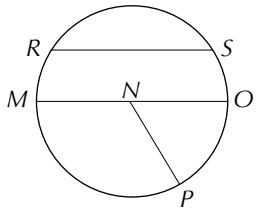
25. Identify each part of the circle with one of these terms: diameter, arc, radius, circumference, chord.

Line *MO* diameter

Line *NP* radius

Line *RS* chord

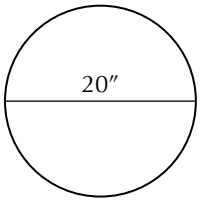
Line *OP* arc



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

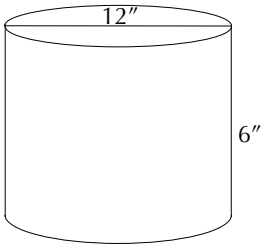
27. Find the circumference of a circle with a 28-inch diameter. Let $\pi = \frac{22}{7}$. 88 inches

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

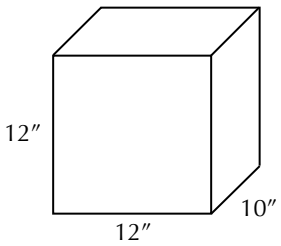


29. Find the volume of a 6-inch cube. 216 cubic inches

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



If you missed this question:	go back to Book 1, chapters:
1 or 2	1
3a	3
3b	4
4–6	6
7 or 8	7
9 or 10	8
11 or 12	9

If you missed this question:	go back to Book 2, chapters:
13	1
14 or 15	2
16	5
17	6
18 or 19	7
20	8
21	9
22 or 23	10
24	11

If you missed this question:	go back to Book 3, chapters:
25	1
26	2
27	4
28	6
29–31	7

Student Profile

Name _____

Date _____

Placement Inventory questions	Skills	Mastery Checkup 1 questions
Level 1 Book 1: Understanding Numbers		
1, 2, 3	Number concepts	
	Counting from 0–9	1, 2
	Numbers from 10–19	3
	Numbers from 20–99	4
	Larger numbers	5
4, 5	Numerals	
	Changing number words into numerals	6, 7, 8, 9
	Money: changing numerals into number words	10, 11
6, 7	Number words	
	Changing numerals into number words	12, 13
	Money: changing numerals into number words	14, 15
8, 9, 10	Values of numbers	
	Values of 2-place numbers	16, 17, 19, 20
	Values of larger numbers	18
Level 1 Book 2: Adding Whole Numbers		
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
	Adding more than two 1-place numbers	24
	Adding more than two 2-place numbers	25
	Adding more than two 3- or 4-place numbers	26
	Adding numbers with different place values	27
14, 15, 16	Adding with carrying	
	Adding 1-place numbers	28
	Adding 2-place numbers	29
	Adding 3- and 4-place numbers	30
	Adding money numbers	31

Placement Inventory questions	Skills	Mastery Checkup 1 questions
Level 1 Book 3: Subtracting Whole Numbers		
17, 18	Subtracting without borrowing	
	Subtracting 1-place numbers	32
	Subtracting 2-place numbers	33
	Subtracting 3- and 4-place numbers	34
19, 20	Subtracting with borrowing	
	Subtracting 2-place numbers	35
	Subtracting 3-place numbers	36
21, 22	Borrowing more than once	
	Subtracting 3-place numbers	37
	Subtracting from a zero	38
	Borrowing from a zero	39
	Subtracting from two zeros	40
	Subtracting 4-place numbers	41
	Subtracting money numbers	42
Level 1 Book 4: Multiplying Whole Numbers		
23, 24	Multiplying by a 1-place number	
	Multiplying 1-place numbers	43
	Multiplying 2-place numbers	44
	Multiplying 3- and 4-place numbers	45
25	Multiplying with carrying	
	Carrying once	46
	Carrying more than once	47
26, 27	Multiplying by a 2-place number	
	Multiplying 2-place numbers	48
	Multiplying 3- and 4-place numbers	49

Placement Inventory questions	Skills	Mastery Checkup 1 questions
Level 1 Book 5: Dividing Whole Numbers		
28, 29	Dividing by a 1-place number, no remainder	
	Dividing into a 1-place number	50
	Dividing into a 2-place number	51
	Dividing into larger numbers	52
	Dividing with regrouping	53, 54
30	Dividing by a 2-place number, no remainder	55
31	Dividing, getting remainders	56, 57
32, 33	Dividing with zeros	58, 59
Level 1 Book 6: Word Problems With Whole Numbers		
34, 35, 36, 37	Word problem attack skills	60, 61, 62, 63
	Finding the question	
	Finding the facts	
	Choosing the appropriate operation	
	Getting the right answer	

Placement Inventory questions	Skills	Mastery Checkup 2 questions
Level 2 Book 1: Understanding and Comparing Fractions		
38	Understanding fractions	
	Recognizing numerator and denominator	1
	Recognizing fractional parts	2
39, 40	Proper fractions, improper fractions, mixed numbers	
	Recognizing proper fractions, improper fractions, and mixed numbers	3
	Changing improper fractions into mixed or whole numbers	4
	Changing mixed numbers to improper fractions	5
41, 42	Fractions of equal value	
	Making equivalent fractions	6
	Reducing fractions to lowest terms	
	— when both terms are even	7, 10
	— when both terms are odd	8
	— when one term is even and the other is odd	9
	— by dividing both terms by numerator	10
43	Common denominators	
	Finding lowest common denominator by looking at multiples of largest denominator	12
	Finding common denominator by multiplying all the denominators	13
44	Comparing two or more fractions (which is largest?)	
	Comparing when the denominators are the same	11
	Comparing by making equivalent fractions	14

Placement Inventory questions	Skills	Mastery Checkup 2 questions
Level 2 Book 2: Adding and Subtracting Fractions		
45, 46	Adding fractions	
	Adding fractions with same denominators	15
	Adding fractions with different denominators	16
47	Adding mixed numbers	
	Adding mixed numbers with same denominators	17
	Combining whole number and improper fraction in the answer	18
	Adding mixed numbers with different denominators	19
48	Subtracting fractions	
	Subtracting mixed numbers with same denominators	20
	Subtracting mixed numbers with different denominators	21
49, 50	Subtracting mixed numbers	
	Subtracting mixed numbers with same denominators	22
	Subtracting mixed numbers with different denominators	23
	Borrowing when the denominators are the same	24
	Borrowing when the denominators are different	25
Level 2 Book 3: Multiplying and Dividing Fractions		
51, 52, 53	Multiplying fractions and mixed numbers	
	Multiplying fractions without cancelling (Review of changing whole number into fraction)	26, 27
	Cancelling before multiplying fractions	28
	Multiplying mixed numbers	29
54, 55	Dividing fractions and mixed numbers	
	Dividing by a fraction (finding inverse of a fraction)	30
	Dividing mixed numbers	31

Placement Inventory questions	Skills	Mastery Checkup 2 questions
Level 2 Book 4: Decimal Fractions		
56, 57	Understanding decimals	
	Recognizing and writing decimals	32
	Using a zero as a placeholder in decimals	33, 34
	Recognizing and writing mixed decimals	35, 36
58	Adding decimals	37
59	Subtracting decimals	38
60	Multiplying decimals	
	Counting number of decimal places in problem	39
	Shortcut for multiplying by 10, 100, or 1,000 (moving decimal point to the right)	40
61	Dividing decimals	
	Dividing decimals by whole numbers	41
	Dividing whole numbers by decimals	42
	Dividing decimals by decimals	43
	Shortcut for dividing by 10, 100, or 1,000 (moving decimal point to the left	44
62	Rounding off decimals	45
63	Changing proper fractions into decimals	46

Placement Inventory questions	Skills	Mastery Checkup 2 questions
Level 2 Book 5: Percents		
64, 65, 66, 67	Understanding percents (from 1% to 100%)	47
	Changing percents into fractions	48
	Changing fractions into percents	49
	Changing percents into decimals	50
	Changing decimals into percents	51
68, 69, 70	Working with percents (from 1% to 100%)	
	Finding percent when part and whole are given (finding percent one number is of another number)	52
	Finding part when percent and whole are given (finding a percent of a number)	53
	Finding whole when percent and part are given (finding a number when a percent of it is given)	54
	Understanding percent questions (figuring out what you're looking for: part, whole, or percent)	55
71	Percents greater than 100%	56
72	Decimals and fractions within percents	57
73, 74, 75	Percents of change	
	Finding percent of change when old and new amounts are given	58
	Finding new amount when percentage of change and old amount are given	59
	Finding old amount when percentage of change and new amount are given	60
Level 2 Book 6: Word Problems With Fractions, Decimals, and Percents		
76, 77, 78, 79, 80	Fraction, decimal, and percent problems	61, 62
	Finding an average	63
	Two-step problems (choosing the appropriate operation and finding the answer)	64, 65

Placement Inventory questions	Skills	Mastery Checkup 3 questions
Level 3 Book 1: Signed Numbers		
81	Understanding positive and negative numbers	1
82, 83, 84	Adding signed numbers	
	Adding when the signs are the same	2
	Adding when the signs are different	3
	Adding more than two signed numbers	4
85, 86	Subtracting signed numbers	
	Subtracting two signed numbers	5
	Subtracting more than two signed numbers	6
87, 88	Multiplying signed numbers	
	Multiplying numbers with the same signs	7
	Multiplying numbers with different signs	8
	Multiplying more than two signed numbers	9
89	Dividing signed numbers	
	Dividing when the signs are the same	10
	Dividing when the signs are different	11
90	Using more than one operation to solve a problem	12

Placement Inventory questions	Skills	Mastery Checkup 3 questions
Level 3 Book 2: Solving Equations		
91	Understanding variables	
	Translating expressions into words	13
	Writing expressions	14
92	Evaluating algebraic expressions	
	Evaluating expressions using one operation	15
	Evaluating expressions using two operations	16
93	Solving equations	
	Solving equations using one inverse operation	17
	Solving equations using two inverse operations	18
94, 95, 96	Combining like variables	
	Adding like variables	19
	Subtracting like variables	20
	Multiplying a variable by a number	21
	Combining variables to solve equations	22
97	Solving equations with variables on both sides	23
98	Solving literal equations	24
Level 3 Book 3: Word Problems in Algebra		
99	Using formulas to solve problems	
	Distance, rate, time problems	25
	Converting temperatures to Celsius or Fahrenheit	26
100	Writing your own equations	27
101	Ratio	28
102, 103	Proportion	
	Using proportions	29
	Using proportions with added steps	30

Placement Inventory questions	Skills	Mastery Checkup 3 questions
Level 3 Book 4: Exponents, Roots, and Polynomials		
104	Factors	
	Factoring positive numbers	31
	Factoring negative numbers	32
105	Exponents	33
106	Square roots	
	Finding root of perfect square	34
	Estimating square roots	35
107	Terms	
	Recognizing terms	36
	Recognizing like terms	37
108	Adding and subtracting monomials	
	Adding monomials	38
	Subtracting monomials	39
109	Multiplying monomials	40, 41
110	Dividing monomials	42, 43
111	Adding monomials	44
112	Subtracting monomials	45
113, 114	Multiplying polynomials	
	Multiplying a polynomial by a monomial	46
	Multiplying a polynomial by a polynomial	47
115	Dividing a polynomial by a monomial	48
116	Finding factors of terms with variables	49
117	Difference of two squares	
	Multiplying sum and difference of two numbers	50
	Factoring difference of two squares	51
Level 3 Book 5: Algebraic Graphs		
118	Finding coordinates for points	
	Locating points	52, 53
	Plotting points	54, 55
119	Plotting equations	
	Plotting one equation	56
	Solving two equations	57

Placement Inventory questions	Skills	Mastery Checkup 4 questions
Level 4 Book 1: Lines and Angles		
120	Identifying lines	
	Names of lines	1
	Kinds of lines	2
121	Names of angles	3a
	Using a protractor	3b
122	Identifying kinds of angles	4, 5, 6
123	Adjacent angles	
	Supplementary angles	7
	Complementary angles	8
124	Vertical angles	9, 10
125	Corresponding angles	11, 12
Level 4 Book 2: Triangles and Quadrangles		
126	Number of degrees in a triangle	13
127	Identifying kinds of triangles	
	By kind of angle	14
	By length of sides	15
128	Finding number of degrees in an angle of a triangle	16
129	Identifying kinds of quadrangles	17
130	Finding perimeter	18, 19
131	Right triangles: Pythagorean theorem	20
132, 133, 134	Finding area	
	Finding area of squares and rectangles	21
	Finding area of triangles	22
	Finding area of parallelograms	23
	Dividing shapes into parts to find area	24

Placement Inventory questions	Skills	Mastery Checkup 4 questions
Level 4 Book 3: Circles and Volume		
135	Identifying parts of circles	25
136	Finding radius and diameter	26
137	Finding circumference	27
138	Finding area of a circle	28
139, 140	Finding volume	
	Finding volume of a cube	29
	Finding volume of a rectangular solid	30
	Finding volume of a cylinder	31