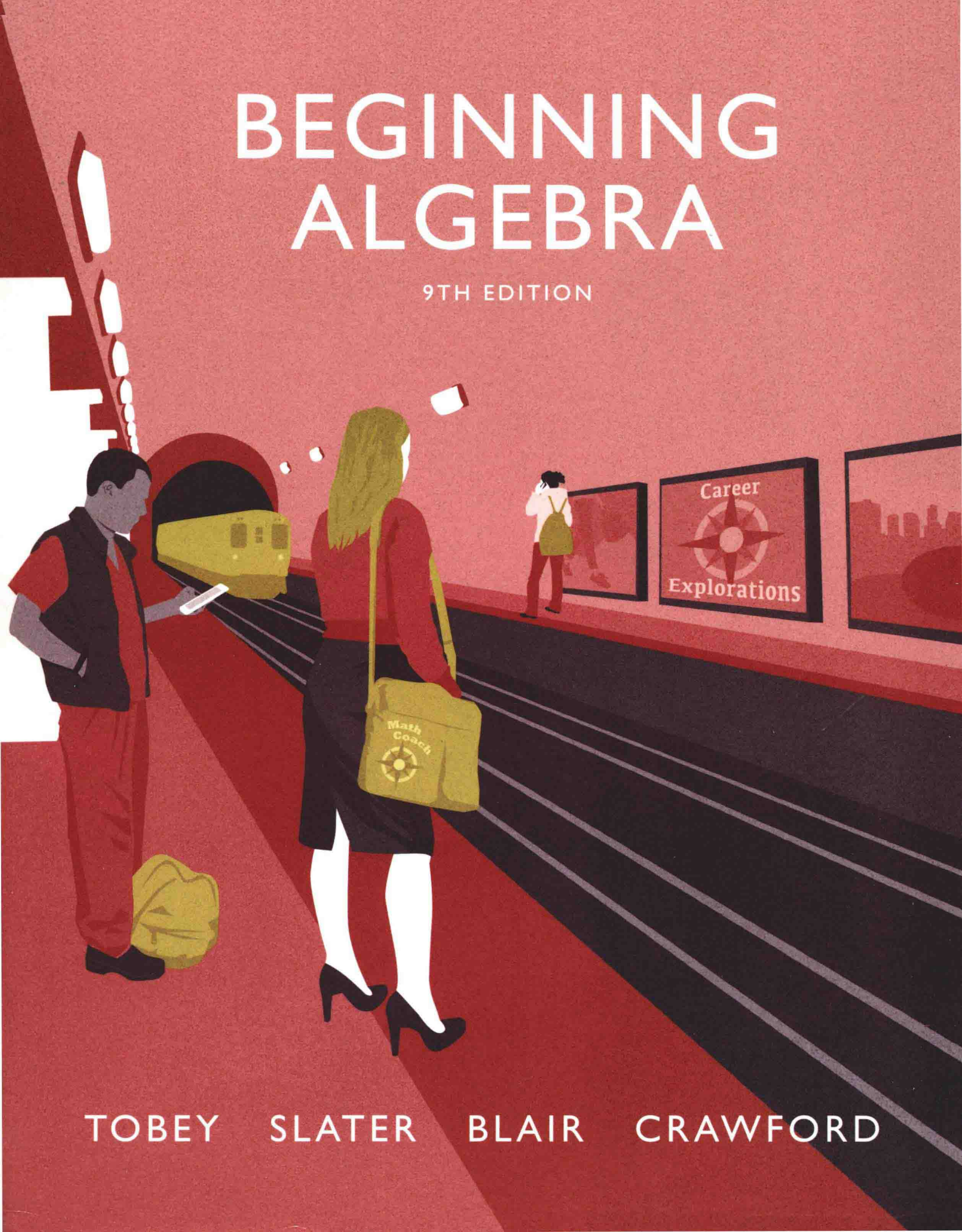
BEGINNING ALGEBRA

9TH EDITION



TOBEY SLATER BLAIR CRAWFORD

Beginning Algebra

Ninth Edition

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This book is dedicated to the memory of
Lexie Tobey and John Tobey, Sr.
They have left a legacy of love, a memory of four
decades of faithful teaching, and a sense of helping
others that will influence generations to come.
For their grandchildren, they have left an inspiring
model of a loving family, true character,
and service to God and community.

Preface

TO THE INSTRUCTOR

Developmental mathematics course structures, trends, and dynamics continue to evolve and change, as **course redesign trends** continue to evolve and change, including the introduction of **new pathways-type courses.** Developmental mathematics instructors are increasingly challenged with helping their students **navigate career-oriented math tracks (including non-STEM and STEM pathways),** plus helping students think about **selecting a major** and **work-force readiness**. To help instructors on this front, with this revision of *Beginning Algebra,* you'll find a **new emphasis on, and integration of, Career Explorations** throughout the text and MyMathLab course.

Additionally, the program retains its hallmark characteristics that have always made the text so easy to learn and teach from, including its building-block organization. Each section is written to stand on its own, and every homework set is completely self-testing. Exercises are paired and graded and are of varying levels and types to ensure that all skills and concepts are covered. As a result, the text offers students an effective and proven learning program suitable for a variety of course formats—including lecture-based classes; computer-lab based or hybrid classes; discussion-oriented, activity-driven classes; modular and/or self-paced programs; and distance-learning, online programs.

We have visited and listened to teachers across the country and have incorporated a number of suggestions into this edition to help you with the particular learning-delivery system at your school. The following pages describe the key changes in this ninth edition.

WHAT'S NEW IN THE NINTH EDITION?

New Career Explorations Interactions for Students

Each chapter begins with a **Career Opportunities** feature that enables students to personally investigate possible future career options while putting the math into context. Students are asked simple, interactive questions prompting them to consider employment opportunities that perhaps they had never thought possible.

Then, the students are directed to the corresponding **Career Exploration Problems** where they can actually solve problems that help them visualize what work would be like in that career field. This feature opens up possibilities for personal success in future employment.

The Career Exploration Problems are also assignable in MyMathLab, allowing this feature to be seamlessly integrated with the technology. The problems help to foster active learning and better understanding of the math concepts.

New Guided Learning Videos

Faculty have asked for specific interactive videos that will clearly show each step of the **key concepts** of each chapter. With this revision, you'll find a new series of **Guided Learning Videos** that show in a powerful, interactive way **how to solve the most important types of problems contained in each chapter.** For student ease, icons throughout the eText indicate where the videos are available. The eText is clickable, opening the videos on the spot. Plus, a new ***Video Workbook with the Math Coach*** allows students to take notes and practice by studying and solving problems.

Expanded Video Program

In addition to the new Guided Learning Videos with icons throughout the eText, objective-level video clips have also been added to the MyMathLab course with accompanying icons throughout the eText. These video additions expand upon an already complete video

lecture series available in MyMathLab. Students and instructors will also find complete Section Lecture Videos, Math Coach Videos, and Chapter Test Prep Videos.

- **The Math Coach** has been expanded within the MyMathLab course, with even more stepped-out, guided Math Coach problems assignable in MyMathLab. Within the text, following each Chapter Test, the **Math Coach** provides students with a personal office-hour experience by walking them through some helpful hints to keep them from making common errors on test problems. For additional help, students can also watch the authors work through these problems on the accompanying Math Coach videos in the MyMathLab course. Instructors can also assign the Math Coach problems in MyMathLab and use the companion *Video Workbook with the Math Coach* for additional practice and to serve as the foundation for a course notebook.
- Fifteen percent of the exercises throughout the text have been refreshed.
- Real-world application problems have been updated throughout the text.
- **New Use Math to Save Money Animations** have been added to the MyMathLab course. The animations expand upon a favorite feature from the text, allowing students to put the math they just learned into context. These newly created animations are set to music and depict real-life scenarios and real-life people using math to cut costs and spend less. To ensure that students watch and understand the animations, there are accompanying Use Math to Save Money homework assignments available in MyMathLab, which are prebuilt for instructor convenience.

  Additionally, we've created an even stronger connection between the approach that is used to teach the concepts in the text, and the media assets and assignable exercises within the accompanying MyMathLab course.

  To make sure you and your students are getting the most out of the text *and* the MyMathLab course, see the following MyMathLab feature descriptions.

BREAKTHROUGH
To improving results

Get the most out of MyMathLab®

MyMathLab is the world's leading online resource for teaching and learning mathematics. MyMathLab helps students and instructors improve results and provides engaging experiences and personalized learning for each student so learning can happen in any environment. Plus, MyMathLab offers flexible and time-saving course-management features to allow instructors to easily manage their classes while remaining in complete control, regardless of course format.

Personalized Support for Students

- MyMathLab comes with many learning resources–eText, animations, videos, and more–all designed to support your students as they progress through their course.

- The Adaptive Study Plan acts as a personal tutor, updating in real time based on student performance to provide personalized recommendations on what to work on next. With the new Companion Study Plan assignments, instructors can now assign the Study Plan as a prerequisite to a test or quiz, helping to guide students through concepts they need to master.

- Personalized Homework allows instructors to create homework assignments tailored to each student's specific needs by focusing on just the topics students have not yet mastered.

Used by nearly 4 million students each year, the MyMathLab and MyStatLab family of products delivers consistent, measurable gains in student learning outcomes, retention, and subsequent course success.

Resources for Success

MyMathLab® Online Course

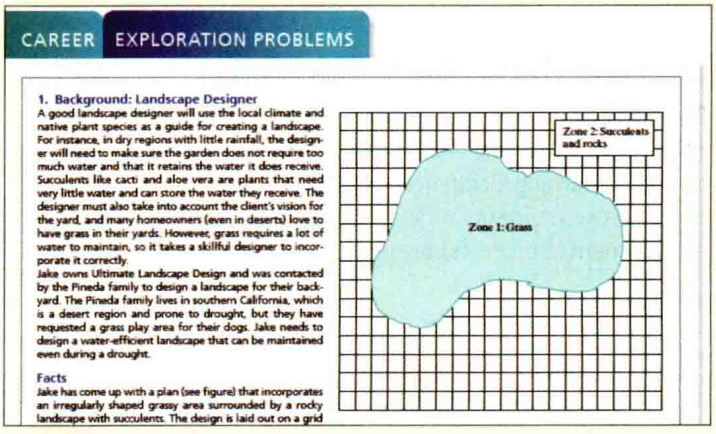
Beginning Algebra by Tobey/Slater/Blair/Crawford

(access code required)

MyMathLab is available to accompany Pearson's market-leading text offerings. To give students a consistent tone, voice, and teaching method, each text's approach is tightly integrated throughout the accompanying MyMathLab course, making learning the material as seamless as possible.

New Career Explorations Interactions

A new integration of Career Explorations has been added throughout the text and MyMathLab course in an interactive format that engages students and gets them thinking about future career possibilities. Each chapter starts with a **Career Opportunities** feature that puts the math into context and ends with multiple **Career Exploration Problems** that are also assignable in MyMathLab!



New Guided Learning Videos, Objective-Level Video Clips, and Video Workbook

New Guided Learning Videos show in a powerful, interactive way how to solve the most important types of problems in each chapter. Icons throughout the eText indicate where videos are available. The eText is clickable, opening videos on the spot. Plus, a new *Video Workbook with the Math Coach* ties it all together and provides opportunity for extra practice.

New Use Math to Save Money Animations

These newly created animations, which have been added to the MyMathLab course, are set to music and depict real-life scenarios in which people use math to cut costs and spend less. Accompanying Use Math to Save Money homework assignments are available in MyMathLab to help further students' understanding.

Resources for Success

With MyMathLab, students and instructors get a robust course-delivery system, the full Tobey/Slater/Blair/Crawford eText, and many assignable exercises and media assets. Additionally, MyMathLab also houses these additional instructor and student resources, making the entire set of resources available in one easy-to-access online location.

Instructor Resources

Annotated Instructor's Edition

This version of the text includes answers to all exercises presented in the book, as well as helpful teaching tips. This resource is available as a hardcopy textbook that you can request through your Pearson sales representative.

Learning Catalytics™ Integration

Generate class discussion, guide your lecture, and promote peer-to-peer learning with real-time analytics. MyMathLab now provides Learning Catalytics—an interactive student-response tool that uses students' smartphones, tablets, or laptops to engage them in more sophisticated tasks and thinking.

Instructors, can

- Pose a variety of open-ended questions that help students develop critical-thinking skills.
- Monitor responses to find out where students are struggling.
- Use real-time data to adjust instructional strategy and try other ways of engaging students during class.
- Manage student interactions by automatically grouping students for discussion, teamwork, and peer-to-peer learning.

Instructor's Solutions Manual

The *Instructor's Solutions Manual* is available for download from the Pearson Instructor's Resource Center or within the MyMathLab course, and it includes detailed, step-by-step solutions to the even-numbered section exercises as well as solutions to every exercise (odd and even) in the Classroom Quiz, mid-chapter reviews, chapter reviews, chapter tests, cumulative tests, and practice final.

Instructor's Resource Manual with Tests and Mini Lectures

Also available for download from the Pearson Instructor's Resource Center and within the MyMathLab course, the *Instructor's Resource Manual* includes a mini lecture for each text section, two short group activities per chapter, three forms of additional practice exercises, two pretests, six tests, and two final exams for every chapter, both free response and multiple choice, as well as two cumulative tests for every even numbered chapter. The *Instructor's Resource Manual* also contains the answers to all items.

PowerPoint Lecture Slides

Available through www.pearsonhighered.com and in MyMathLab, these fully editable lecture slides include definitions, key concepts, and examples for use in a lecture setting.

TestGen

TestGen® (www.pearsoned.com/testgen) enables instructors to build, edit, print, and administer tests using a computerized bank of questions developed to cover all the objectives of the text. TestGen is algorithmically based, allowing instructors to create multiple but equivalent versions of the same question or test with the click of a button. Instructors can also modify test bank questions or add new questions. The software and test bank are available for download from Pearson's Instructor Resource Center.

Student Resources

Student Solutions Manual

The *Student Solutions Manual* provides worked-out solutions to all odd-numbered section exercises, even and odd exercises in the Quick Quiz, mid-chapter reviews, chapter reviews, chapter tests, Math Coach, and cumulative reviews. Instructors have the option to make an electronic version available to students within the MyMathLab course, or students can purchase it separately in printed form.

New Video Workbook with the Math Coach

The new *Video Workbook with the Math Coach* expands upon the popular *Math Coach* workbook format and is correlated with the new Guided Learning Videos to serve as a video note-taking and practice guide for students. It is available to students in electronic form within the MyMathLab course, and students can also purchase it separately in printed form.

Student Success Module in MyMathLab

This new interactive module is available in the left-hand navigation of MyMathLab and includes videos, activities, and post-tests for these three student-success areas:

- **Math-Reading Connections**, including topics such as "Using Word Clues" and "Looking for Patterns."
- **Study Skills**, including topics such as "Time Management" and "Preparing for and Taking Exams."
- **College Success**, including topics such as "College Transition" and "Online Learning."

Instructors can assign these videos and/or activities as media assignments, along with prebuilt post-tests to make sure students learn and understand how to improve their skills in these areas. Instructors can integrate these assignments with their traditional MyMathLab homework assignments to incorporate student success topics into their course, as they deem appropriate.

Diagnostic Pretest: Beginning Algebra

Follow the directions for each question. Simplify each answer.

Chapter 0

1. Add. $3\frac{1}{4} + 2\frac{3}{5}$

2. Multiply. $\left(1\frac{1}{6}\right)\left(2\frac{2}{3}\right)$

3. Divide. $\frac{15}{4} \div \frac{3}{8}$

4. Multiply. $(1.63)(3.05)$

5. Divide. $120 \div 0.0006$

6. Find 7% of 64,000.

Chapter 1

7. Add. $-3 + (-4) + (+12)$

8. Subtract. $-20 - (-23)$

9. Combine. $5x - 6xy - 12x - 8xy$

10. Evaluate $2x^2 - 3x - 4$ when $x = -3$.

11. Remove the grouping symbols. $2 - 3\{5 + 2[x - 4(3 - x)]\}$

12. Evaluate. $-3(2 - 6)^2 + (-12) \div (-4)$

Chapter 2

In questions 13–16, solve each equation for x.

13. $40 + 2x = 60 - 3x$

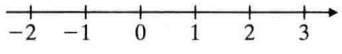
14. $7(3x - 1) = 5 + 4(x - 3)$

15. $\frac{2}{3}x - \frac{3}{4} = \frac{1}{6}x + \frac{21}{4}$

16. $\frac{4}{5}(13x + 4) = 20$

17. Solve for p. $A = \frac{1}{2}(13p - 4f)$

18. Solve for x and graph the result. $42 - 18x < 48x - 24$



Chapter 3

19. The length of a rectangle is 7 meters longer than twice the width. The perimeter is 46 meters. Find the dimensions.

20. One side of a triangle is triple the second side. The third side is 3 meters longer than double the second side. Find each side of the triangle if the perimeter of the triangle is 63 meters.

21. Hector has four test scores of 80, 90, 83, and 92. What does he need to score on the fifth test to have an average of 86 on the five tests?

22. Marcia invested $6000 in two accounts. One earned 5% interest, while the other earned 7% interest. After one year, she earned $394 in interest. How much did she invest in each account?

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42. _____

23. Melissa has three more dimes than nickels. She has twice as many quarters as nickels. The value of the coins is $4.20. How many of each coin does she have?

24. The drama club put on a play for Thursday, Friday, and Saturday nights. The total attendance for the three nights was 6210. Thursday night had 300 fewer people than Friday night. Saturday night had 510 more people than Friday night. How many people came each night?

Chapter 4

25. Multiply. $(-2xy^2)(-4x^3y^4)$

26. Divide. $\dfrac{36x^5y^6}{-18x^3y^{10}}$

27. Raise to the indicated power. $(-2x^3y^4)^5$

28. Evaluate. $(-3)^{-4}$

29. Multiply. $(3x^2 + 2x - 5)(4x - 1)$

30. Divide. $(x^3 + 6x^2 - x - 30) \div (x - 2)$

Chapter 5

Factor completely.

31. $5x^2 - 5$

32. $x^2 - 12x + 32$

33. $8x^2 - 2x - 3$

34. $3ax - 8b - 6a + 4bx$

Solve for x.

35. $16x^2 - 24x + 9 = 0$

36. $\dfrac{x^2 + 8x}{5} = -3$

Chapter 6

37. Simplify.

$$\frac{x^2 + 3x - 18}{2x - 6}$$

38. Multiply.

$$\frac{6x^2 - 14x - 12}{6x + 4} \cdot \frac{x + 3}{2x^2 - 2x - 12}$$

39. Divide and simplify.

$$\frac{x^2}{x^2 - 4} \div \frac{x^2 - 3x}{x^2 - 5x + 6}$$

40. Add.

$$\frac{3}{x^2 - 7x + 12} + \frac{4}{x^2 - 9x + 20}$$

41. Solve for x.

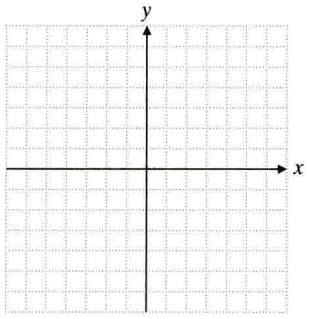
$$2 - \frac{5}{2x} = \frac{2x}{x + 1}$$

42. Simplify.

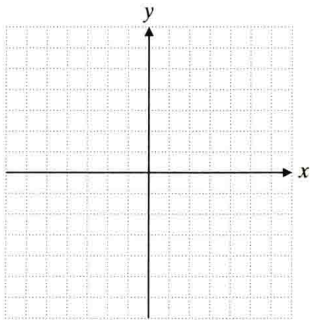
$$\frac{3 + \dfrac{1}{x}}{\dfrac{9}{x} + \dfrac{3}{x^2}}$$

Chapter 7

43. Graph. $y = 2x - 4$



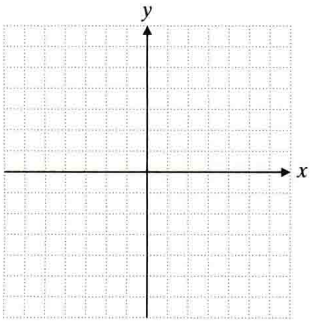
44. Graph. $3x + 4y = -12$



45. What is the slope of a line passing through $(6, -2)$ and $(-3, 4)$?

46. If $f(x) = 2x^2 - 3x + 1$, find $f(3)$.

47. Graph the region. $y \geq -\frac{1}{3}x + 2$



48. Find the equation of a line with a slope of $\frac{3}{5}$ that passes through the point $(-1, 3)$.

Chapter 8

Solve each system by the appropriate method.

49. Substitution method

$$x + y = 17$$
$$2x - y = -5$$

50. Addition method

$$-5x + 4y = 8$$
$$2x + 3y = 6$$

51. Any method

$$2(x - 2) = 3y$$
$$6x = -3(4 + y)$$

52. Any method

$$x + \frac{1}{3}y = \frac{10}{3}$$
$$\frac{3}{2}x + y = 8$$

53. Is $(2, -3)$ a solution for the following system?

$$3x + 5y = -9$$
$$2x - 3y = 13$$

54. A man bought three pairs of gloves and four scarves for \$53. A woman bought two pairs of the same-priced gloves and three of the same-priced scarves for \$38. How much did each item cost?

43. _____

44. _____

45. _____

46. _____

47. _____

48. _____

49. _____

50. _____

51. _____

52. _____

53. _____

54. _____

Chapter 9

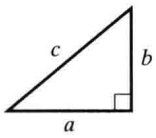
55. Evaluate. $\sqrt{121}$

56. Simplify. $\sqrt{125x^3y^5}$

57. Multiply and simplify.
$(\sqrt{2} + \sqrt{6})(2\sqrt{2} - 3\sqrt{6})$

58. Rationalize the denominator.
$$\frac{\sqrt{5} - \sqrt{3}}{\sqrt{6}}$$

59. In the right triangle with sides a, b, and c, find side c if side $a = 4$ and side $b = 6$.



60. y varies directly with x. When $y = 56$, then $x = 8$. Find y when $x = 11$.

Chapter 10

In questions 61–64, solve for x.

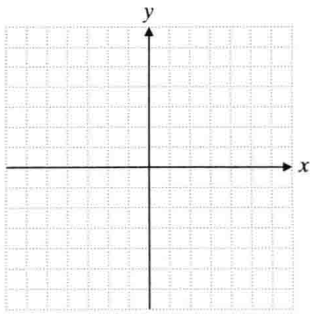
61. $14x^2 + 21x = 0$

62. $2x^2 + 1 = 19$

63. $2x^2 - 4x - 5 = 0$

64. $x^2 - x + 8 = 5 + 6x$

65. Graph the equation. $y = x^2 + 8x + 15$



66. A rectangle is 4 inches longer in length than in width. The area of the rectangle is 96 square inches. Find the length and the width of the rectangle.

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