Name _____ Date _____

CHAPTER 4

Parents as Partners

For use with Chapter 4

Chapter Overview **One way you can help your student succeed in Chapter 4 is by discussing the lesson goals in the chart below. When a lesson is completed, ask your student the following questions. "What were the goals of the lesson? What new words and formulas did you learn? How can you apply the ideas of the lesson to your life?"**

Lesson Title	Lesson Goals	Key Applications
4.1: Graph Quadratic Functions in Standard Form	Graph quadratic functions.	• Go-carts • Online Music • Digital Cameras
4.2: Graph Quadratic Functions in Vertex or Intercept Form	Graph quadratic functions in vertex form and intercept form.	• Civil Engineering • Football • Biology
4.3: Solve $x^2 + bx + c = 0$ by Factoring	Use factoring to solve $x^2 + bx + c = 0$.	• Nature Preserve • Skate Park • School Fair
4.4: Solve $ax^2 + bx + c = 0$ by Factoring	Use factoring to solve $ax^2 + bx + c = 0$.	• Quilts • Painting • Magazines
4.5: Solve Quadratic Equations by Finding Square Roots	Solve quadratic equations by finding square roots.	• Science Competition • Astronomy • Cliff Diving
4.6: Perform Operations with Complex Numbers	Perform operations with complex numbers.	• Electricity • Circuits • Mandelbrot Sets
4.7: Complete the Square	Solve quadratic equations by completing the square.	• Baseball • Drum Major • Video Game Revenue
4.8: Use the Quadratic Formula and the Discriminant	Solve quadratic equations using the quadratic formula.	• Juggling • Biology • Cellular Telephones
4.9: Graph and Solve Quadratic Inequalities	Graph and solve quadratic inequalities.	• Rappelling • Robotics • Architecture
4.10: Write Quadratic Functions and Models	Write quadratic functions and models.	• Pumpkin Tossing • Running • Antenna Dish

Big Ideas for Chapter 4

In Chapter 4, you will apply the big ideas listed in the Chapter Opener (see page 235) and reviewed in the Chapter Summary (see page 317).

1. Graphing and writing quadratic functions in several forms
2. Solving quadratic equations using a variety of methods
3. Performing operations with square roots and complex numbers

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CHAPTER SUPPORT

CHAPTER 4

Parents as Partners *continued*

For use with Chapter 4

Key Ideas **Your student can demonstrate understanding of key concepts by working through the following exercises with you.**

Lesson	Exercise
4.1	What is the effect on the graph of the function $y = x^2$ when it is changed to $y = -2x^2 + 3$?
4.2	Write the quadratic function $y = -2(x - 1)(x + 3)$ in standard form. Give the vertex, axis of symmetry, and x-intercepts. Is the vertex a maximum or minimum point?
4.3	Find the zeros of the function $y = x^2 + 10x - 24$ by rewriting the function in intercept form. Explain what this tells you about the graph of the function.
4.4	A rectangular rug has an area of 15 square units. It measures $4x + 5$ units long and $x + 4$ units wide. Find the value of x.
4.5	You are working on a roof and drop your hammer from a height of 40 feet. Write an equation giving the hammer's height after t seconds where the air resistance is considered negligible. How long does it take the hammer to hit the ground?
4.6	Write the expression as a complex number in standard form. $(2 - 5i)(-3 + 9i)$
4.7	Solve $6x^2 + 10x - 55 = x^2 + 100$ by completing the square. What does this tell you about the graph of $y = 5x^2 + 10x - 155$?
4.8	An existing rectangular window measures 4 feet wide by 5 feet high. You want to double the window area by adding $2x$ feet to the width and x feet to the height. Find the approximate value of x.
4.9	Solve $3x^2 + 2x - 4 > 0$.
4.10	Write a quadratic function in standard form for the parabola that passes through the points $(-3, 4)$, $(-2, 5)$, and $(2, 1)$.

Home Involvement Activity

Directions Select a favorite picture you would like to frame and hang in your room. Measure the length and width of the picture. How wide should the frame be if you want the area of the picture and frame to be 20% larger than the area of the picture?

Answers

4.1: vertically stretched, reflected in the x-axis, translated 3 units up **4.2:** $y = -2x^2 - 4x + 6$; $(-1, 8)$; $x = -1$; -3, 1; maximum **4.3:** -12, 2; passes through $(-12, 0)$ and $(2, 0)$ **4.4:** -0.25 **4.5:** $h = -16t^2 + 40$; $\frac{\sqrt{10}}{2}$ sec **4.6:** $39 + 33i$ **4.7:** $1 \pm 4\sqrt{2}$; The x-intercepts are $-1 \pm 4\sqrt{2}$. **4.8:** $1\frac{1}{4}$ ft **4.9:** $x < -1.54$ or $x > 0.87$ **4.10:** $y = -0.4x^2 - x + 4.6$