

**Parent Guide for Student Success**

For use with Chapter 5

**Chapter Overview** One way that you can help your student succeed in Chapter 5 is by discussing the lesson goals in the chart below. When a lesson is completed, ask your student to interpret the lesson goals for you and to explain how the mathematics of the lesson relates to one of the key applications listed in the chart.

<i>Lesson Title</i>	<i>Lesson Goals</i>	<i>Key Applications</i>
<b>5.1: Graphing Quadratic Functions</b>	Graph quadratic functions and use quadratic functions to solve real-life problems.	<ul style="list-style-type: none"> <li>• Civil Engineering</li> <li>• Automobiles</li> <li>• Physiology</li> </ul>
<b>5.2: Solving Quadratic Equations by Factoring</b>	Factor to solve quadratic equations. Find zeros of quadratic functions.	<ul style="list-style-type: none"> <li>• Business</li> <li>• Environment</li> <li>• Home Electronics</li> </ul>
<b>5.3: Solving Quadratic Equations by Finding Square Roots</b>	Solve quadratic equations by finding square roots and use quadratic equations to solve real-life problems.	<ul style="list-style-type: none"> <li>• History</li> <li>• Astronomy</li> <li>• Television</li> </ul>
<b>5.4: Complex Numbers</b>	Solve quadratic equations with complex solutions and perform operations with complex numbers.	<ul style="list-style-type: none"> <li>• Fractal Geometry</li> <li>• Mandelbrot Set</li> <li>• Electricity</li> </ul>
<b>5.5: Completing the Square</b>	Solve equations by completing the square and write quadratic functions in vertex form.	<ul style="list-style-type: none"> <li>• Traffic Engineering</li> <li>• Sports</li> <li>• Firefighting</li> </ul>
<b>5.6: The Quadratic Formula and the Discriminant</b>	Solve equations using the quadratic formula. Use the formula to solve real-world problems.	<ul style="list-style-type: none"> <li>• Entertainment</li> <li>• Aviation</li> <li>• Earth Science</li> </ul>
<b>5.7: Graphing and Solving Quadratic Inequalities</b>	Graph quadratic inequalities in two variables. Solve quadratic inequalities in one variable.	<ul style="list-style-type: none"> <li>• Driving</li> <li>• Theater</li> <li>• Forestry</li> </ul>
<b>5.8: Modeling with Quadratic Functions</b>	Write functions given characteristics of their graphs. Use technology to find quadratic models for data.	<ul style="list-style-type: none"> <li>• Fuel Economy</li> <li>• Botany</li> <li>• Baseball</li> </ul>

**Study Strategy**

**Troubleshooting** is the study strategy featured in Chapter 5 (see page 248). Encourage your student to look back over each lesson and try to solve exercises that were initially too difficult. Give what help you can or suggest that your student ask a classmate or the teacher for help.

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

<b>Lesson</b>	<b>Exercise</b>
<b>5.1</b>	A company sells posters. The company's monthly revenue $R$ can be modeled by the function $R = 4000 + 600x - 100x^2$ , where $x$ is the dollar increase in the selling price over \$4. What selling price maximizes revenue and what is the maximum revenue?
<b>5.2</b>	Write the quadratic function $y = 2x^2 + 6x - 20$ in intercept form and give the zeros of the function.
<b>5.3</b>	A 12 by 30 foot rectangular garden has a diagonal path from corner to corner with length $c$ . According to the Pythagorean Theorem, $c^2 = 1044$ . Find the length of the path to the nearest tenth of a foot.
<b>5.4</b>	Write the quotient $\frac{2 + 3i}{3 - i}$ as a complex number in standard form.
<b>5.5</b>	Write the quadratic function $y = x^2 - 6x + 8$ in vertex form. What is the vertex of the graph?
<b>5.6</b>	A 10 by 14 meter garden will have a sidewalk of width $x$ along the two 14 meter sides and width $2x$ along the two 10 meter sides. Approximate the value of $x$ that will make the area covered by the sidewalks and the garden total 174 square meters.
<b>5.7</b>	Solve $x^2 - 2x \leq 15$ .
<b>5.8</b>	Write a quadratic function in standard form whose graph passes through the points (2, 1), (0, 3), and (-2, 9).

**Home Involvement Activity**

**You Will Need:** A tape measure

**Directions:** Measure the length and width of your living room to the nearest quarter of a foot. Suppose you want an area rug to fit in your living room so that the distance to the wall on either end of the rug is twice the distance to the wall on either side of the rug. You also want the area of the rug to be 80% of the area of your living room. What should be the dimensions of the rug?

5.1: \$7, \$4900    5.2:  $y = 2(x + 5)^2 - 5$     5.3: 32.3 ft    5.4:  $\frac{10}{3} + \frac{10}{11}$   
 5.5:  $y = (x - 3)^2 - 1$ ; (3, -1)    5.6: about 0.47 m    5.7:  $-3 \leq x \leq 5$     5.8:  $y = 0.5x^2 - 2x + 3$

ANSWERS