

## Parent Guide for Student Success

For use with Chapter 3

**Chapter Overview** One way that you can help your student succeed in Chapter 3 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>3.1: Lines and Angles</b>	Identify relationships between lines. Identify angles formed by transversals.	<ul style="list-style-type: none"> <li>• Tightrope Walking</li> <li>• Roman Numerals</li> <li>• Escalators</li> </ul>
<b>3.2: Proof and Perpendicular Lines</b>	Write different types of proofs and prove results about perpendicular lines.	<ul style="list-style-type: none"> <li>• Circuit Boards</li> <li>• Window Repair</li> <li>• Reflections</li> </ul>
<b>3.3: Parallel Lines and Transversals</b>	Prove and use results about parallel lines and transversals. Use the properties of parallel lines to solve real-world problems.	<ul style="list-style-type: none"> <li>• Botany</li> <li>• Earth's Circumference</li> <li>• Forming Rainbows</li> </ul>
<b>3.4: Proving Lines are Parallel</b>	Prove that two lines are parallel. Use properties of parallel lines to solve real-life problems.	<ul style="list-style-type: none"> <li>• Sailing</li> <li>• Archaeology</li> <li>• Building Stairs</li> </ul>
<b>3.5: Using Properties of Parallel Lines</b>	Use properties of parallel lines in real-life situations. Construct parallel lines using a straightedge and compass.	<ul style="list-style-type: none"> <li>• Building a CD Rack</li> <li>• Football Field</li> <li>• Hanging Wallpaper</li> </ul>
<b>3.6: Parallel Lines in the Coordinate Plane</b>	Find slopes of lines and use slope to identify parallel lines in a coordinate plane. Write equations of parallel lines in a coordinate plane.	<ul style="list-style-type: none"> <li>• Underground Railroad</li> <li>• Zip Line</li> <li>• Civil Engineering</li> </ul>
<b>3.7: Perpendicular Lines in the Coordinate Plane</b>	Use slope to identify perpendicular lines in a coordinate plane and write equations of perpendicular lines.	<ul style="list-style-type: none"> <li>• Computer Illustration</li> <li>• Needlepoint</li> <li>• Sculpture</li> </ul>

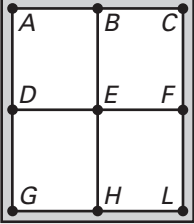
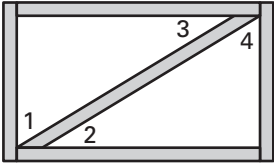
### Study Strategy

**Writing Sample Questions** is the study strategy featured in Chapter 3 (see page 128). Encourage your student to create a test, exchange tests with a classmate, score each other's tests, and plan further study. You may wish to discuss with your student the kinds of test questions the teacher is likely to ask and to help your student in developing a study plan.

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

Lesson	Exercise
3.1	Think of each segment in the window frame as part of a line. Name all labeled lines that appear to be parallel. Name all labeled lines that appear to be perpendicular to $\overline{GL}$ . 
3.2	Use the diagram from the exercise for Lesson 3.1. Suppose you know that $\overline{BH} \perp \overline{DF}$ . What theorem tells you that $\angle BEF$ is a right triangle?
3.3	A transversal intersects parallel lines. One interior angle has a measure of $75^\circ$ . The measure of its alternate interior angle is $(4x + 7)^\circ$ . Find $x$ .
3.4	The diagram shows a brace like those used in building houses. Assume that the brace lies in a plane and that you can measure the labeled angles. How could you use the angles to prove that the vertical boards are parallel? 
3.5	Use the diagram from Lesson 3.4. Using a carpenter's square, you verify that each vertical board forms a right angle with the bottom board in the frame. How could you prove the vertical boards are parallel?
3.6	Write an equation of the line that passes through the point $P(-6, 2)$ and is parallel to the line with the equation $y = \frac{2}{3}x - 7$ .
3.7	Are the graphs of $3x - 4y = 2$ and $4x + 3y = 5$ perpendicular lines?

**Home Involvement Activity**

**You will need:** a straightedge or a ruler and drawing paper.

**Directions:** Draw a floor plan of your house. Label parallel and perpendicular lines. Analyze the angles formed. Discuss how you could use them to prove that the lines you have labeled are parallel or perpendicular.

**Answers**  
 3.1:  $\overleftrightarrow{AC} \parallel \overleftrightarrow{DF} \parallel \overleftrightarrow{GL}$ ,  $\overleftrightarrow{AG} \parallel \overleftrightarrow{BH} \parallel \overleftrightarrow{CL}$ ,  $\overleftrightarrow{AG} \perp \overleftrightarrow{GL}$ ,  $\overleftrightarrow{BH} \perp \overleftrightarrow{GL}$ ,  $\overleftrightarrow{CL} \perp \overleftrightarrow{GL}$ . 3.2: If two lines are perpendicular, then they intersect to form four right triangles. 3.3: 17 3.4: Show that  $\angle 1 \cong \angle 4$ . The lines are parallel by the Alternate Interior Angles Converse. 3.5: In a plane, if two lines are perpendicular to the same line, then they are parallel to each other. 3.6:  $y = \frac{2}{3}x + 6$  3.7: yes