NAME ______________________________ DATE __________

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.

Lesson Title	*Lesson Goals*	*Key Applications*
5.1: Perpendiculars and Bisectors	Use properties of perpendicular bisectors. Use properties of angle bisectors to identify equal distances.	• Roof Trusses • Early Aircraft • Ice Hockey
5.2: Bisectors of a Triangle	Use properties of perpendicular bisectors of a triangle. Use properties of angle bisectors of a triangle.	• Facilities Planning • Choosing a New Home • Mushroom Growth
5.3: Medians and Altitudes of a Triangle	Use properties of medians of a triangle. Use properties of altitudes of a triangle.	• Center of Population • Electrocardiograph • Building a Mobile
5.4: Midsegment Theorem	Identify the midsegments of a triangle. Use properties of midsegments of a triangle.	• Origami • Fractals • Porch Swing
5.5: Inequalities in One Triangle	Use triangle measurements to decide which side is longest or which angle is largest. Use the Triangle Inequality.	• Director's Chair • Kitchen Work Triangle • Channel Dredging
5.6: Indirect Proof and Inequalities in Two Triangles	Read and write an indirect proof. Use the Hinge Theorem and its converse to compare side lengths and angle measures.	• Aviation • Expandable Gate • Hiking

Test-Taking Strategy

Skip questions which are taking too long or becoming too frustrating. If you ***move quickly on easier problems*** *and* ***make effective use of shortcuts****, you may have time to* ***revisit difficult questions****. Try to find a fresh approach to use.* Have your student show you an example from the chapter of a problem that can be solved more quickly using some type of shortcut. Also, you may wish to discuss with your student a situation in which taking a break from a problem enabled you to come back to it with a fresh perspective.

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

Lesson	*Exercise*
5.1	Suppose a ball is at point A on a pool table and you place the white cue ball at a point B so that $\overleftrightarrow{AB}$ is parallel to the long side of the table. A bank shot is where you hit the cue ball against the long side of the table at some point C and then the cue ball hits the other ball at point A. A line drawn through C perpendicular to the long side of the table will bisect $\angle ACB$. What is the relationship between the line bisecting $\angle ACB$ and $\overleftrightarrow{AB}$?
5.2	Explain how to find the point that is equidistant from the three vertices of a triangle.
5.3	$\triangle ABC$ has vertices $A(-1, 2)$, $B(3, 0)$, and $C(4, 4)$. The centroid of $\triangle ABC$ is $P(2, 2)$. Let M be the midpoint of $\overline{AB}$. Show that $PC = \frac{2}{3}CM$.
5.4	$\triangle JKM$ has vertices $J(-3, 2)$, $K(3, 2)$, and $M(1, -4)$. Let P be the midpoint of $\overline{JK}$ and N be the midpoint of $\overline{JM}$. Find the coordinates of P and N and show $\overleftrightarrow{PN} \parallel \overleftrightarrow{KM}$.
5.5	You have 11 meters of string to enclose a triangular area in your yard. You want to use only whole meters for the sides. What is the longest you can make a side?
5.6	Write the first statement in an indirect proof of Theorem 5.3 which states that "if a point is on the bisector of an angle, then it is equidistant from the two sides of the angle."

Home Involvement Activity

You Will Need: Light cardboard, scissors, compass, and straightedge
Directions: Draw 4 large, congruent, acute scalene triangles on the cardboard. Construct the circumcenter of the first triangle, the incenter of the second, the centroid of the third, and the orthocenter of the fourth. Cut the triangles out. Which constructed center should be the balance point of the triangle? To confirm your answer, try to balance each triangle on the point of a pen placed at the constructed center.

Answers

5.1: The line is the perpendicular bisector of $\overline{AB}$.
5.2: Draw the perpendicular bisector to each side of the triangle and find where the three perpendicular bisectors meet.
5.3: $PC = 2\sqrt{2}$, $CM = 3\sqrt{2}$ and $\frac{2}{3}(3\sqrt{2}) = 2\sqrt{2}$
5.4: $P(0, 2)$; $N(-1, -1)$; $\overleftrightarrow{PN}$ and $\overleftrightarrow{KM}$ both have a slope of 3. **5.5:** 5 m
5.6: Start by assuming that the point is not equidistant from the sides of the angle.