NAME _____ DATE _____

Parent Guide for Student Success

For use with Chapter 9

Chapter Overview **One way that you can help your student succeed in Chapter 9 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*
9.1: Similar Right Triangles	Solve problems involving similar right triangles formed by the altitude drawn to the hypotenuse. Use a geometric mean to solve problems.	• Roof Height • Monorail Station • Rock Climbing
9.2: The Pythagorean Theorem	Prove the Pythagorean Theorem. Use the Pythagorean Theorem to solve real-life problems.	• Malaysian Support Beam • Softball Diamond • Trans-Alaska Pipeline
9.3: The Converse of the Pythagorean Theorem	Use the Converse of the Pythagorean Theorem to solve problems. Use side lengths to classify triangles by their angle measures.	• House Foundation • Babylonian Tablet • Air Travel
9.4: Special Right Triangles	Find the side lengths of special right triangles. Use special right triangles to solve real-life problems.	• Tipping Platform • Jewelry • Tools
9.5: Trigonometric Ratios	Find the sine, the cosine, and the tangent of an acute angle. Use trigonometric ratios to solve real-life problems.	• Forestry • Water Slide • Lunar Cartography
9.6: Solving Right Triangles	Solve a right triangle. Use right triangles to solve real-life problems.	• Space Shuttle • Longs Peak • Wheelchair Ramps
9.7: Vectors	Find the magnitude and the direction of a vector. Add vectors.	• Velocity of a Jet • Tug-of-War Game • Skydiving

Study Strategy

List What You Know is the study strategy featured in Chapter 9 (see page 526). Have your student list what he or she already knows about the title of the chapter and what he or she expects to learn. Encourage your student to review the list when the chapter is finished. Discuss what your student learned and whether or not his or her expectations were met.

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

Lesson	Exercise
9.1	To find the height of a tree, you hold a cardboard square at your eye level and line up consecutive edges of the square with the top and bottom of the tree. Your eye is 5 feet above the ground and 14 feet from the tree (perpendicular distance). Estimate the height of the tree.
9.2	A right triangle has a hypotenuse that is 12 centimeters long and a leg that is 10 centimeters long. Find the approximate area of the triangle.
9.3	The ancient Egyptians used a closed loop of rope, knotted to form evenly spaced sections, and the idea behind the Converse of the Pythagorean Theorem to determine right angles when building the pyramids. If a loop of rope had 24 sections, how long should each side be to form a right triangle?
9.4	When a 30-foot drawbridge is raised 30°, its outer end is just over the outer edge of the castle's moat. What is the horizontal distance from the inner end of the drawbridge to the outer edge of the moat?
9.5	A road rises 60 feet in 1000 feet of horizontal distance. Find the tangent, sine, and cosine of the angle of elevation to 4 decimal places. (*Hint:* Use the Pythagorean Theorem.)
9.6	In $\triangle QRS$, $m\angle R = 90°$, $m\angle S = 16°$, and $QR = 7$ in. Solve the right triangle. Round decimals to the nearest tenth.
9.7	Vector $\overrightarrow{PQ}$ has terminal points $P(2, -1)$ and $Q(-3, 2)$. Write the component form of the vector and find its magnitude.

Home Involvement Activity

You will need: A piece of rope about 7 feet long

Directions: Divide the rope into 12 equal sections by making 11 knots to mark off the sections. Use the knotted rope to construct a right angle as follows: One person holds the two ends of the rope together. The second person holds the rope at the fifth knot. A third person pulls the rope taut at the eighth knot. The angle formed at the eighth knot should be a right angle. How do you know that this angle is a right angle?

Answers

9.1: about 44 ft **9.2:** about 33.2 cm^2 **9.3:** 6, 8, and 10 spaces **9.4:** $15\sqrt{3}$ or almost 26 ft **9.5:** 0.0600; 0.0599; 0.9982 **9.6:** $RS \approx 24.4$ in., $QS \approx 25.4$ in., $m\angle Q = 74°$ **9.7:** $\langle -5, 3\rangle$, about 5.8