CHAPTER 13

NAME _____ DATE _____

# Parent Guide for Student Success

**For use with Chapter 13**



**Chapter Overview** **One way that you can help your student succeed in Chapter 13 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* |
|---|---|---|
| **13.1: Right Triangle Trigonometry** | Use trigonometric relationships to evaluate trigonometric functions of acute angles. Use trigonometric functions to solve real-life problems. | • Kite Flying<br>• Aviation<br>• Duquesne Incline |
| **13.2: General Angles and Radian Measure** | Measure angles in standard position using degree measure and radian measure. Measure arc lengths and areas of sectors. | • Bicycles<br>• Space Needle<br>• Figure Skating |
| **13.3: Trigonometric Functions of Any Angle** | Evaluate trigonometric functions of any angle and use trigonometric functions to solve real-life problems. | • Marching Band<br>• Skateboarding<br>• Ferris Wheel |
| **13.4: Inverse Trigonometric Functions** | Evaluate inverse trigonometric functions. Use inverse trigonometric functions to solve real-life problems. | • Construction<br>• Swimming Pool<br>• Draw Bridge |
| **13.5: The Law of Sines** | Use the law of sines to find the sides and angles of a triangle. Find the area of any triangle. | • Astronomy<br>• Real Estate<br>• Hang Glider |
| **13.6: The Law of Cosines** | Use the law of cosines to find the sides and angles of a triangle. Use Heron's formula to find the area of a triangle. | • Softball<br>• Trapeze Artists<br>• Surveying |
| **13.7: Parametric Equations and Projectile Motion** | Use parametric equations to represent motion in a plane and to represent projectile motion. | • Pumpkin Tossing<br>• Water Skiing<br>• Leaping Dolphin |

## Study Strategy

**Drawing Diagrams** is the study strategy featured in Chapter 13 (see page 768). Have your student give examples from this chapter to show how drawing a diagram can help in solving a problem.

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

| Lesson | Exercise |
|---|---|
| **13.1** | At a wind speed of 30 miles per hour, a kite makes an angle of 60° with the ground. If you are using 400 feet of line with the end held 4 feet above the ground, at about what altitude is the kite flying? |
| **13.2** | Find the angle between the hands of a clock at 4:00. Give your answer in degrees and in radians. |
| **13.3** | Evaluate the function without using a calculator: $\cos\left(\frac{7\pi}{6}\right)$. |
| **13.4** | Solve the equation $\sin\theta = 0.7431$, where $90° < \theta < 180°$. |
| **13.5** | A triangular room has an angle of 120° between walls that are 24 feet long and 20 feet long. At \$3.50 a square foot, how much would it cost to carpet the room? |
| **13.6** | A city park is in the shape of a triangle with sides of length 10 meters, 12 meters, and 14 meters. Find the area of the park. |
| **13.7** | Write an $xy$-equation for the parametric equations $x = 5t - 10$ and $y = -3t + 2$ for $0 \leq t \leq 10$. State the domain. |

## Home Involvement Activity

**You Will Need:** A protractor, string, a small heavy object
**Directions:** Tie the heavy object to one end of the string. Tie the other end of the string to the center of the protractor. Hold the protractor upside down with the straight side on top. Stand back and sight the top of a tree in your yard or neighborhood along the straight edge of the protractor. Have your student read the angle (less than 90°) where the string falls on the protractor. Subtract this angle from 90°. The result is the angle between your line of sight and the ground. Measure the distance from your position to the bottom of the tree. Use trigonometric ratios to find the height of the tree. Repeat this procedure for three different distances from the tree. Do you always get the same height for the tree?

**Answers**

**13.1:** about 350 ft **13.2:** 120°; $\frac{2\pi}{3}$ **13.3:** $-\frac{\sqrt{3}}{2}$ **13.4:** 132° **13.5:** \$727.46 **13.6:** about 54.8 $m^2$

**13.7:** $y = -\frac{3}{5}x - 4$; $-10 \leq x \leq 40$