

Name _____

9-7B Lesson Master**Questions on SPUR Objectives**

See pages 576–579 for objectives.

USES Objectives E and F

1. Consider the formula $d = \frac{n(n-3)}{2}$, where d is the number of diagonals of an n -sided polygon. Suppose a polygon has 20 diagonals. How many sides does this polygon have? _____
2. Can a polygon have 125 diagonals? Explain.

3. Draw a convex 9-sided polygon. How many diagonals does this polygon have? _____
4. The area of a triangle is 110 square inches. The height of the triangle is 8 less than 3 times its base. What are the height and base of the triangle? Round your answers to the nearest hundredth. _____
5. The area of a rectangle is 225 inches. The length is 5 more than twice its width. What are the length and width of the rectangle? Round your answers to the nearest hundredth. _____
6. The expression $1 + 3 + 5 + 7 + 9$ is the sum of the first five positive odd integers. A more general pattern can be stated as, "The sum of the first n positive odd integers is n^2 ."
 - a. For the sum $1 + 3 + 5 + 7 + 9$, what is n ? n^2 ? _____
 - b. Show two ways to find the sum of the first 10 positive odd integers.

 - c. If the sum of the first n positive odd integers is 625, what is n ? _____
7. Joaquin wants to make a rectangular play area that is 75 square feet with the length equal to five more than twice the width.
 - a. Write an equation to express the area in terms of the width. _____
 - b. Solve the resulting quadratic equation to find the length and width. _____

Name _____

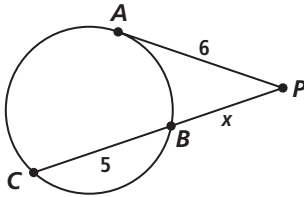
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8. The equation $y = 0.0493x^2 + 1.294x - 4.304$ can be used to determine the total stopping distance y (the sum of reaction distance and braking distance) in feet that an automobile will require when traveling x miles per hour.

- a. What is the total stopping distance of an automobile traveling 45 miles per hour? Round your answer to the nearest whole number.
- b. If it takes an automobile 370 feet to stop, how fast is it traveling?

9. In the figure below, \overline{PA} is tangent to the circle at point A . (It intersects the circle only at that point.) Another segment from P intersects the circle at points B and C . In geometry, you will learn that $PA^2 = PB \cdot PC$. Suppose $PA = 6$, $BC = 5$, and $PB = x$.



- a. What is the length of \overline{PC} ? _____
- b. Substitute into $PA^2 = PB \cdot PC$ and solve the resulting quadratic equation to find PB . _____

10. The north and south sides of the Golden Gate Bridge are parabolas formed from cables. If the center of the bridge is the point $(0, 0)$, then the equation $y = \frac{x^2}{9,130.43}$ represents the height y of the cables at x distance from the center of the bridge.

- a. The span of the bridge is 4,200 feet. The maximum height of the parabolas is found 2,100 feet from the center of the bridge. How high is the cable 2,100 feet from the center? Round your answer to the nearest hundredth.
- b. Engineers were called to repair one of the cables. The cable needs a repair 250 feet above the bridge. How far from the center of the bridge is the repair area located?

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