Honors Algebra: Word Problems (8-1 to 8-4) Name _____

Use an equation to solve each problem.

3. The area of a rectangle is 360 square meters. Its length is 24 meters. What is its width?

4. The area of a rectangle is 440 square inches. Its width is 20 inches. What is its length?

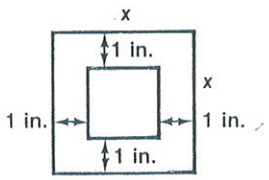
5. The length of a rectangle is 4 feet more than twice the width. The perimeter is 116 feet. Find the dimensions of the rectangle.

6. The perimeter of a football field is 1040 feet. The length of the field is 120 feet less than 3 times the width. What are the dimensions of the field?

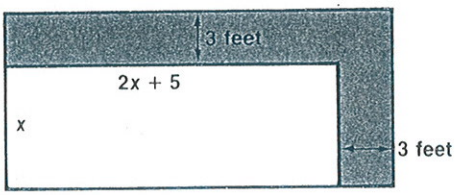
7. A certain triangle has two congruent sides. The third side is 17 cm shorter than either of the equal sides. If the perimeter is 91 cm, what is the length of the third side?

8. The sides of a triangle are $4x$, $2x + 6$, and $7x - 9$. If the perimeter of the triangle is 62 inches, find the lengths of the three sides.

9. To get a square photograph to fit into a square frame, Linda LaGuardia had to trim a 1-inch strip from each side of the photo as shown below. In all, she trimmed off 40 square inches. What were the original dimensions of the photograph?



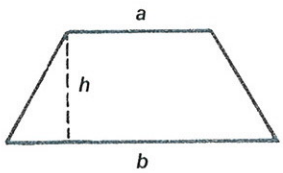
10. A rectangular garden is 5 feet longer than twice its width. It has a sidewalk 3 feet wide on two of its sides, as shown below. The area of the sidewalk is 213 square feet. Find the dimensions of the garden.



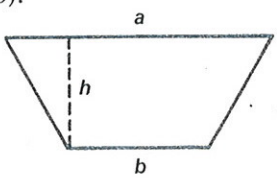
11. The second side of a triangle is twice the length of the first. The third side is 3 cm less than the second side. What are the lengths of the sides if the perimeter is 37 cm?

12. The three sides of a triangle have measures that are consecutive odd numbers. What are the lengths of the sides if the perimeter is 87 m?

13. A trapezoid has an area of 162 m^2 and a height of 12 m. The lower base is 6 m more than twice the upper base. Find the length of the upper base. Use $A = \frac{1}{2}h(a + b)$.



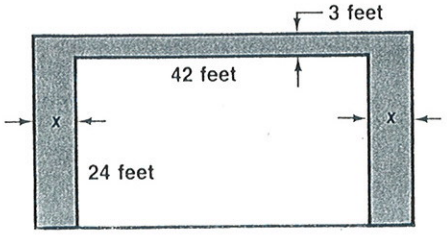
14. A trapezoid has an area of 81 ft^2 and a height of 9 ft. The upper base is 14 ft less than 3 times the lower base. Find the length of the lower base. Use $A = \frac{1}{2}h(a + b)$.



15. The length of a rectangle is 20 yards greater than the width. If the length was decreased by 5 yards, and the width increased by 4 yards, the area would remain unchanged. Find the original dimensions of the rectangle.

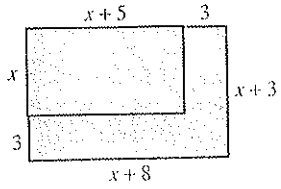
16. The length of a rectangle is 7 cm less than twice its width. If the length was increased by 11 cm and the width decreased by 6 cm, the area would be decreased by 40 square centimeters. Find the original dimensions of the rectangle.

17. Mr. Herrera had a concrete sidewalk built on three sides of his yard as shown at the right. The yard measures 24 by 42 feet. The longer walk is 3 feet wide. The price of the concrete was \$22 per square yard, and the total bill was \$902. What is the width of the walk on the remaining two sides?

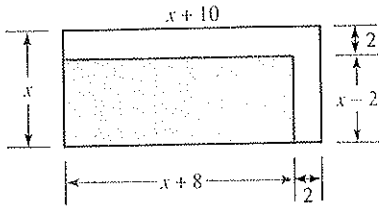


Solve.

1. A rectangle is 5 cm longer than it is wide. If its length and width are both increased by 3 cm, its area is increased by 60 cm^2. Find the dimensions of the original rectangle.



2. A rectangle is 10 m longer than it is wide. If its length and width are both decreased by 2 m, its area is decreased by 48 m^2. Find its original dimensions.



Problems

Solve.

A 1. A rectangle is three times as long as it is wide. If its length and width are both decreased by 2 cm, its area is decreased by 36 cm^2. Find its original dimensions. Make a sketch as in Oral Exercise 2.

2. A rectangle is twice as long as it is wide. If both its dimensions are increased by 4 m, its area is increased by 88 m^2. Make a sketch as in Oral Exercise 1. Find the dimensions of the original rectangle.

3. A rectangular swimming pool is three times as long as it is wide and is surrounded by a deck 2.5 m wide. Find the dimensions of the pool if the area of the deck is 265 m^2.

4. A poster is 25 cm taller than it is wide. It is mounted on a piece of cardboard so that there is a 5 cm border on all sides. If the area of the border alone is 1350 cm^2, what are the dimensions of the poster?

5. A brick patio is twice as long as it is wide. It is bordered on all sides by a garden 1.5 m wide. Find the dimensions of the patio if the area of the garden is 54 m^2.

6. A house has two rooms of equal area. One room is square and the other room is a rectangle 4 ft narrower and 5 ft longer than the square one. Find the area of each room.

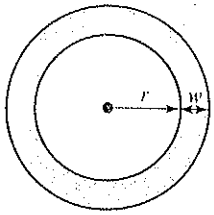
B 7. A small city park consists of a rectangular lawn surrounded on all sides by a 330 m^2 border of flowers 2.5 m wide. Find the area of the lawn if the entire park is 5 m longer than it is wide.

8. A corner lot that originally was square lost 185 m^2 of area when one of the adjacent streets was widened by 3 m and the other was widened by 5 m. Find the new dimensions of the lot. (*Hint:* Let x = the length of a side of the original square lot.)

9. The area of a circle of radius r is given by the formula $A = \pi r^2$. Use this fact to find a formula for the shaded area in the figure below.

In Problems 10 and 11, refer to Problem 9.

Use $\frac{22}{7}$ as an approximation for π.

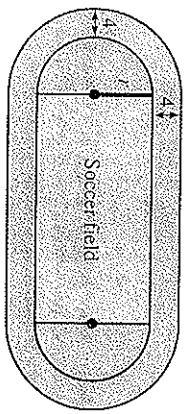


Exs. 9-11

10. Find the radius r if the width w of the shaded region is 2 cm and its area is 176 cm^2.

11. A circular pool is surrounded by a brick walkway 3 m wide. Find the radius of the pool if the area of the walkway is 198 m^2.

C 12. A running track 4 m wide goes around a soccer field that is twice as long as it is wide. At each end of the soccer field the track is a semi-circle with inner radius r. Find a formula for the area of the track in terms of π and r.



13. a. Suppose that you plan to run once around the track described in Problem 12. If you stay 0.5 m from the inner edge of the track, how far will you run? (*Hint:* The circumference of a circle is $2\pi r$. Your answer will be in terms of π and r.)

b. Suppose that a friend stays 0.5 m from the outer edge of the track. How much farther does your friend run than you do?