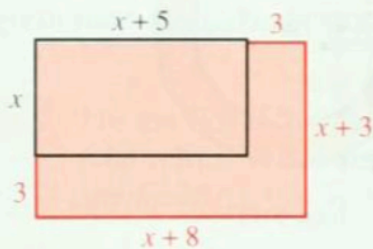


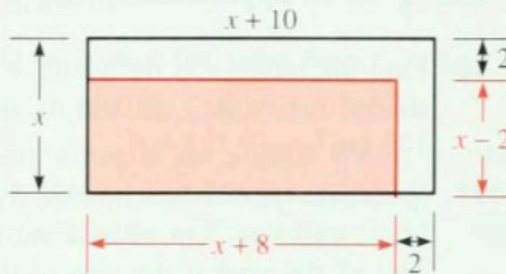
Oral Exercises

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

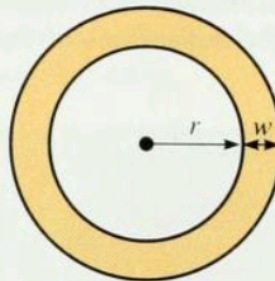
Solve.

- 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.

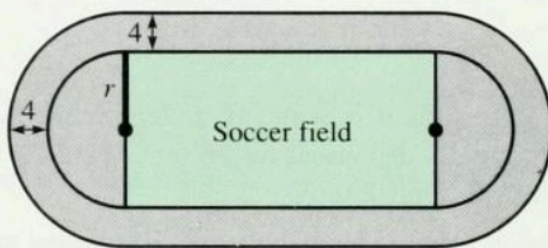
Use $\frac{22}{7}$ as an approximation for π .



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?

Mixed Review Exercises

Simplify.

- | | | |
|-------------------------------------|---|---|
| 1. $(-5 + 9) + (-8)$ | 2. $6(c - 2) + (-3)c + 5$ | 3. $(4xy^3)^3$ |
| 4. $y - (-7) - [y + (-7)]$ | 5. $5^3 \cdot 2^2$ | 6. $(7 \cdot 4 + 4 \cdot 5) \div (3 \cdot 2)$ |
| 7. $-\frac{9}{4} + \frac{5}{4} + 1$ | 8. $\left(\frac{1}{2}x^4\right)\left(\frac{2}{5}x^3\right)$ | 9. $-\frac{x}{11}(-143)$ |
| 10. $(-8 + 12) + (-4)$ | 11. $\left(\frac{1}{3}y^3\right)\left(\frac{3}{5}y\right)$ | 12. $(3y^2z)^4$ |