

- 32. PHOTOGRAPHY** A rectangular photograph is 8 centimeters wide and 12 centimeters long. The photograph is enlarged by increasing the length and width by an equal amount in order to double its area. What are the dimensions of the new photograph? **12 cm by 16 cm**

- 9. FOOTBALL** A place kicker kicks a ball upward with a velocity of 32 feet per second. Ignoring the height of the kicking tee, how long after the football is kicked does it hit the ground? Use the formula $h(t) = v_0t - 16t^2$ where $h(t)$ is the height of an object in feet, v_0 is the object's initial velocity in feet per second, and t is the time in seconds. (Lesson 5-2)

2 s

REMODELING For Exercises 14 and 15, use the following information. (Lesson 5-3)

Sandy's closet was supposed to be 10 feet by 12 feet. The architect decided that this would not work and reduced the dimensions by the same amount x on each side. The area of the new closet is 63 square feet. **14–16. See margin.**

- 14.** Write a quadratic equation that represents the area of Sandy's closet now.
- 15.** Find the new dimensions of her closet.

14. $(10 - x)(12 - x) = 63$, so
 $x^2 - 22x + 57 = 0$

15. 7 ft by 9 ft

- 43. GARDENING** Antoinette has a rectangular rose garden with the length 8 feet longer than the width. If the area of her rose garden is 128 square feet, find the dimensions of the garden.

43. 8 ft by 16 ft

- 29. PETS** A rectangular turtle pen is 6 feet long by 4 feet wide. The pen is enlarged by increasing the length and width by an equal amount in order to double its area. What are the dimensions of the new pen? **8 ft by 6 ft**

- 28. NUMBER THEORY** Find two consecutive even positive integers whose product is 624.
24, 26

- 29. NUMBER THEORY** Find two consecutive odd positive integers whose product is 323.
17, 19

- 30. GEOMETRY** The length of a rectangle is 2 feet more than its width. Find the dimensions of the rectangle if its area is 63 square feet. **7 ft by 9 ft**

- 31. PHOTOGRAPHY** The length and width of a 6-inch by 8-inch photograph are reduced by the same amount to make a new photograph whose area is half that of the original. By how many inches will the dimensions of the photograph have to be reduced? **2 in.**

RUGBY For Exercises 61 and 62, use the following information.

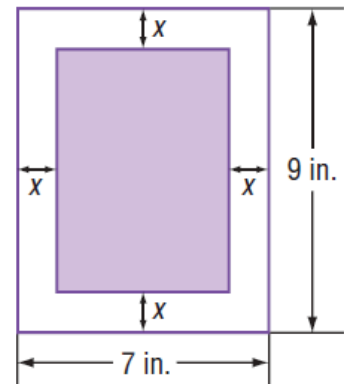
The length of a Rugby League field is 52 meters longer than its width w .

61. Write an expression for the area of the rectangular field. $[w(w + 52)] \text{ m}^2$
62. The area of a Rugby League field is 8160 square meters. Find the dimensions of the field. **120 m by 68 m**

GEOMETRY For Exercises 49 and 50, use the following information.

A rectangle with an area of 35 square inches is formed by cutting off strips of equal width from a rectangular piece of paper.

49. Find the width of each strip. **1 in.**
50. Find the dimensions of the new rectangle. **5 in. by 7 in.**



CRITICAL THINKING Find all values of k so that each trinomial can be factored using integers.

57. $x^2 + kx - 19$ **-18, 18**
58. $x^2 + kx + 14$ **-15, -9, 9, 15**
59. $x^2 - 8x + k, k > 0$ **7, 12, 15, 16**
60. $x^2 - 5x + k, k > 0$ **4, 6**

CRITICAL THINKING Find all values of k so that each trinomial can be factored as two binomials using integers.

32. $2x^2 + kx + 12$ **$\pm 25, \pm 14, \pm 11, \pm 10$**
33. $2x^2 + kx + 15$ **$\pm 31, \pm 17, \pm 13, \pm 11$**
34. $2x^2 + 12x + k, k > 0$ **10, 16, 18**
31. Find all values of k so that the trinomial $x^2 + kx - 35$ can be factored using integers. **-34, -2, 2, 34**

21. Find all values of k so that $t^2 + kt - 8$ can be factored using integers.

7, -7, 2, -2