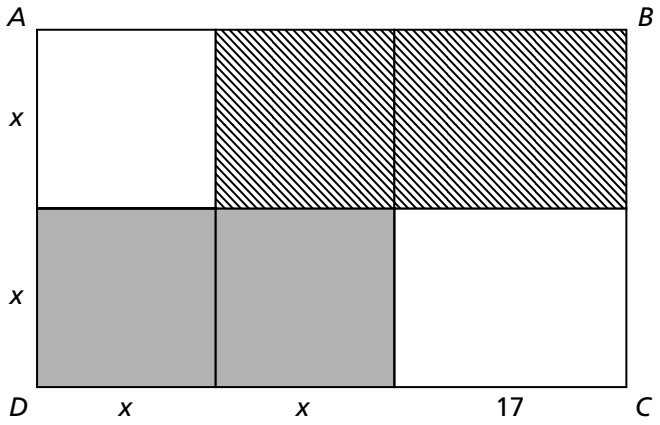
Name _____ Date _____ Class _____

Additional Practice

Investigation 2

Frogs, Fleas, and Painted Cubes

1. Refer to the diagram below to answer parts (a)–(f).



a. Write an expression for the area of the diagonally shaded region.

b. Write an expression for the area of the gray region.

c. Write an expression for the total area of the white regions.

d. Write an expression for the difference in areas between the diagonally shaded region and the gray region.

e. Write an expression for the perimeter of rectangle $ABCD$.

f. Write an expression for the area of rectangle $ABCD$.

Draw and label a rectangle whose area is represented by the expression. Then write an equivalent expression in expanded form.

2. $(x + 1)(x + 5)$ **3.** $3x(x - 4)$ **4.** $(x + 6)(x + 2)$

Additional Practice *(continued)*

For Exercises 5–10, write the expression in factored form. You may want to draw a rectangle to illustrate the area represented by the expression.

5. $x^2 + 2x + 9x + 18$

6. $x^2 + 4x$

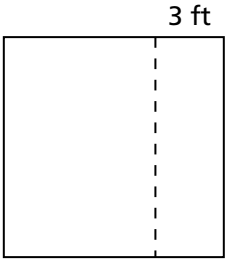
7. $x^2 + 12x + 36$

8. $x^2 + 2x + 7x + 14$

9. $x^2 + 7x + 12$

10. $x^2 + 12x + 27$

11. Serena and Chuck had a large square piece of cardboard for designing a poster advertising the upcoming drama club fund-raiser. They decided to trim 3 feet from the length of the cardboard.



Suppose each side of the original square of cardboard had a length of x feet.

a. Write an expression for the area of the strip that Serena and Chuck trimmed from the large piece.

b. Write an expression for the area of the remaining piece of cardboard.

c. Write an expression for the perimeter of the strip that Serena and Chuck trimmed from the large piece.

d. Write an expression for the perimeter of the remaining piece of cardboard.

e. The perimeter of the original piece of cardboard was 36 feet.

i. What is the area of the strip that Serena and Chuck trimmed from the large piece?

ii. What is the area of the remaining piece of cardboard?

iii. What is the perimeter of the remaining piece of cardboard?

Additional Practice *(continued)*

12. A square has sides of length x centimeters. A new rectangle is made by increasing one dimension by 2 centimeters and decreasing the other dimension by 2 centimeters.

a. Make a table showing the area of the square and the area of the new rectangle for whole number x values from 0 to 10.

b. Which values for area are not reasonable? Explain.

c. On the same set of axes, graph the (x, area) data for both the square and the rectangle. Graph only those values for which the area is positive.

d. Write an equation for the area of the original square and an equation for the area of the new rectangle. Use these equations to label the graphs you made in part (c).

13. A square has sides of length x centimeters. A new rectangle is made by increasing one dimension by 2 centimeters.

a. Make a sketch to show how the square is transformed into the new rectangle.

b. Make a table showing the area of the square and the area of the new rectangle for whole number x values from 0 to 10.

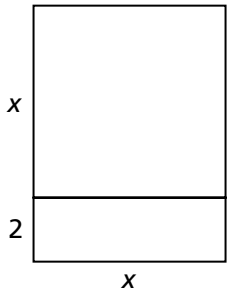
c. On the same set of axes, graph the (x, area) data for both the square and the rectangle.

d. Write an equation for the area of the original square and an equation for the area of the new rectangle.

Additional Practice *(continued)*

Write two expressions, one in factored form and one in expanded form, for the area of the unshaded region.

14.



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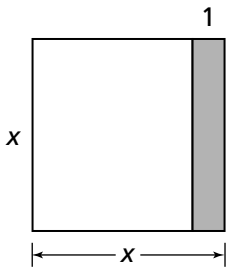

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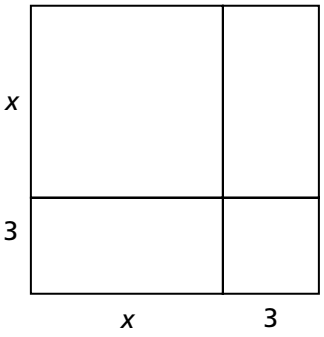
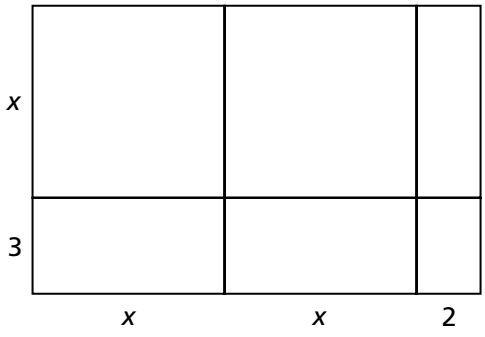


17.



For Exercises 18–21, draw and label a rectangle whose area is represented by the expression. Write an equivalent expression in factored form.

18. $x^2 + 4x$

19. $x^2 + x + x + 1$

20. $x^2 + 3x + 2$

21. $x^2 + 2x + 1$