PRACTICE & PROBLEM SOLVING

Scan for Multimedia

Practice Tutorial

Additional Exercises Available Online

UNDERSTAND

17. **Mathematical Connections** How could you use special factoring patterns to quickly rewrite the difference $50^2 - 45^2$ as a product? Explain.

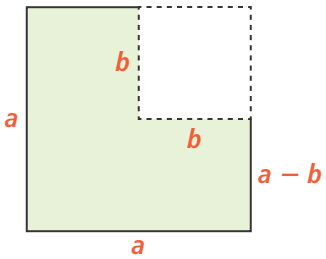
18. **Reason** Is the expression $x^2 - 50$ factorable? Explain why or why not.

19. **Look for Relationships** What is the completely factored form of the expression $16x^4 - y^4$? Describe the method(s) of factoring you used.

20. **Error Analysis** Describe and correct the error a student made in factoring $x^2 - 36$.

> Use the perfect-square trinomial pattern to factor $x^2 - 36$ because both terms are perfect squares.
>
> $x^2 - 36 = (x - 6)(x - 6)$ ✗

21. **Higher Order Thinking** Use the visual shown as a starting point. Describe how you can use diagrams to show that $a^2 - b^2 = (a + b)(a - b)$.



22. **Make Sense and Persevere** Describe the steps you would use to factor the expression $x^4 - 8x^2 + 16$.

23. **Reason** A rectangle has a width that is twice the length. If the area of the rectangle is represented by the expression $18x^2 + 48x + 32$, what expression represents the length of the rectangle? Explain.

24. **Communicate Precisely** How can you determine if a binomial of the form $x^2 - \frac{a}{b}$ is factorable using rational constants?

PRACTICE

Identify the value of *c* that would make the trinomial factorable using the perfect-square pattern. SEE EXAMPLE 1

25. $x^2 + 24x + c$

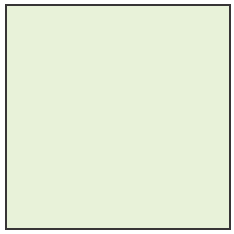
26. $x^2 - 10x + c$

27. $6x^2 - 36x + c$

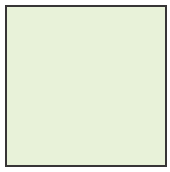
28. $3x^2 + 24x + c$

Given the area of each square, factor to find the side length. SEE EXAMPLES 1 AND 2

29. Area $= 36x^2 + 120x + 100$



30. Area $= 144x^2 - 24x + 1$



Factor each expression completely. SEE EXAMPLES 1, 3, and 4

31. $x^2 + 16x + 64$

32. $x^2 - 25$

33. $x^2 - 18x + 81$

34. $x^2 - 14x + 49$

35. $100x^2 - 36$

36. $16x^2 + 40x + 25$

37. $8x^2 - 32x + 32$

38. $16x^2 - 81y^2$

39. $2x^3 + 32x^2 + 128x$

40. $7x^3y - 63xy^3$

41. $49x^3 - 16xy^2$

42. $121x^2 + 110x + 25$

43. $-3x^3 + 18x^2 - 27x$

44. $64x^2y^2 - 144z^2$

Factor each expression as the product of binomials.

45. $x^2 - \frac{1}{4}$

46. $x^2 - \frac{1}{9}$

47. $p^2 - \frac{49}{100}$

48. $x^2 + x + \frac{1}{4}$

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Mixed Review Available Online

APPLY

49. **Reason** In front of a school are several gardens in rectangular raised beds. For each of the areas of a rectangular garden given, use factoring to find possible dimensions. Could the garden be square? If so, explain why.

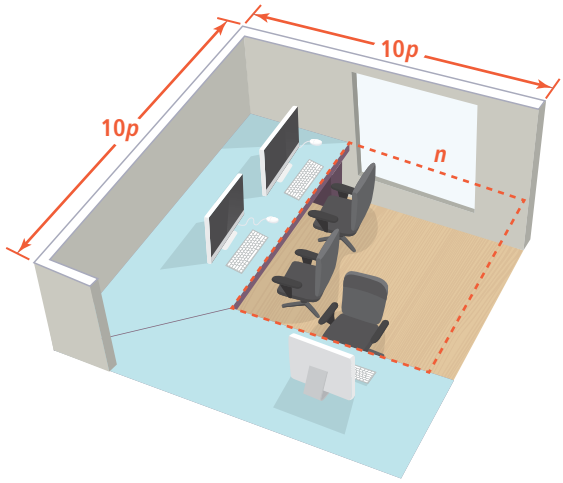
a. $x^2 + 32x + 256$

b. $x^2 - 4y^2$

c. $x^2 - 20x + 100$

50. **Make Sense and Persevere** The area of a rectangular rug is $49x^2 - 25y^2$ in.^{2}. Use factoring to find possible dimensions of the rug. How are the side lengths related? What value would you need to subtract from the longer side and add to the shorter side for the rug to be a square?

51. **Model With Mathematics** A furniture company created an L-shaped table by removing part of a square table.



a. Write an expression that represents the area of the L-shaped table.

b. What are all the side lengths of the L-shaped table?

c. The furniture company decides to create another table with the same area, but needs this table to be rectangular. What are the possible dimensions of the rectangular table? Explain.

ASSESSMENT PRACTICE

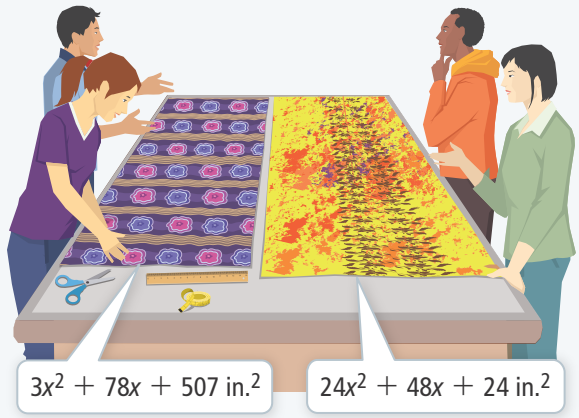
52. Match each expression with its factored form.

I.	$25m^2 - 9n^2$	**A.**	$(5m + 3n)^2$
II.	$25m^2 - 30mn + 9n^2$	**B.**	$(5m - 3n)^2$
III.	$25m^2 - 30mn - 9n^2$	**C.**	$(5m + 3n)(5m - 3n)$
IV.	$25m^2 + 30mn + 9n^2$	**D.**	does not factor

53. **SAT/ACT** What is the factored form of $6x^2 - 60x + 150$?

Ⓐ $6(x - 25)^2$
Ⓑ $6(x - 5)(x - 10)$
Ⓒ $6(x - 5)^2$
Ⓓ $6(x - 5)(x + 5)$

54. **Performance Task** Two pieces of fabric are being used for clothing designs for a fashion show at school Expressions for the areas of the rectangular pieces are shown..



Part A Factor the expressions for the areas completely.

Part B Using the factorings from Part A, write all of the possible dimensions of the pieces of fabric as binomials.

Part C Assume that the table is about 6 ft long. Using integer values for x, which set of binomials yields to most reasonable dimensions based on the picture?

Part D Using your result from Part C what are the dimensions in inches of the two pieces of fabric?