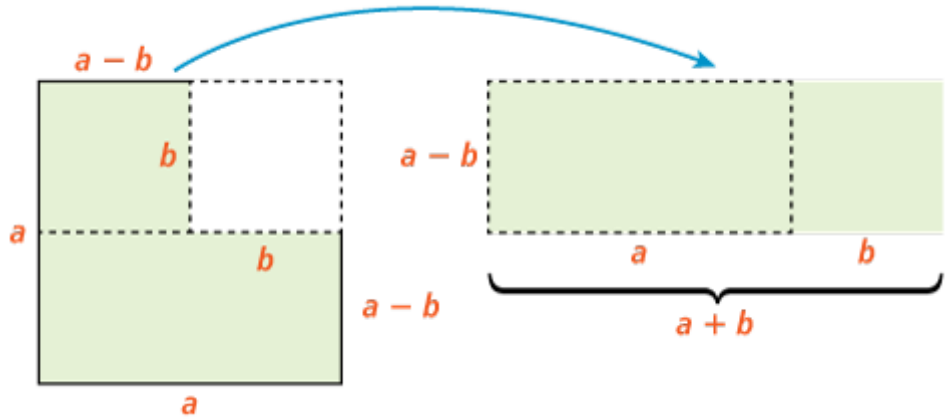
17. You can use a difference of two squares to rewrite $50^2 - 45^2$ as $(50 - 45)(50 + 45) = 5(95)$.

18. No; because the second term of 50 is not a perfect square, a difference of two squares pattern does not apply. Additionally, the two terms have no common factors.

19. $(2x - y)(2x + y)(4x^2 + y^2)$; difference of two squares followed by difference of two squares.

20. The student used the wrong pattern for factoring. Instead, the student should use the pattern for a difference of two squares. The factored form of the expression is $(x + 6)(x - 6)$.

21.



22. First, use the pattern for a perfect square trinomial to get $(x^2 - 4)^2$. Then apply a difference of two squares pattern to each of the factors to get $(x + 2)(x - 2)(x + 2)(x - 2)$, or $(x + 2)^2(x - 2)^2$.

23. $3x + 4$; Since the width is twice the length, the rectangle is made of two squares side-by-side. If you divide the area by 2, the resulting expression will be the area of each square, $9x^2 + 24x + 16$, which is a perfect-square trinomial. Factor the perfect-square trinomial to find the length of each square, which is also the length of the rectangle.

24. If both a and b are squares of integers and $b \neq 0$, then the fraction is a perfect square and can be factored as $x^2 - \frac{a}{b} = \left(x - \frac{\sqrt{a}}{\sqrt{b}}\right)\left(x + \frac{\sqrt{a}}{\sqrt{b}}\right)$.

25. 144

26. 25

27. 54

28. 48

29. $(6x + 10)$

30. $(12x - 1)$

31. $(x + 8)^2$

32. $(x + 5)(x - 5)$

33. $(x - 9)^2$

34. $(x - 7)^2$

35. $(10x + 6)(10x - 6)$ or $4(5x + 3)(5x - 3)$

36. $(4x + 5)^2$

37. $8(x - 2)^2$

38. $(4x + 9y)(4x - 9y)$

39. $2x(x + 8)^2$

40. $7xy(x + 3y)(x - 3y)$

41. $x(7x + 4y)(7x - 4y)$

42. $(11x + 5)^2$

43. $-3x(x - 3)^2$

44. $16(2xy + 3z)(2xy - 3z)$ or $(8xy + 12z)(8xy - 12z)$

45. $\left(x - \frac{1}{2}\right)\left(x + \frac{1}{2}\right)$

46. $\left(x - \frac{1}{3}\right)\left(x + \frac{1}{3}\right)$

47. $\left(p - \frac{7}{10}\right)\left(p + \frac{7}{10}\right)$

48. $\left(x + \frac{1}{2}\right)\left(x + \frac{1}{2}\right)$

49. **a.** $(x + 16)$ by $(x + 16)$; yes; The factors are equal so the side lengths are the same.

b. $(x + 2y)$ by $(x - 2y)$; yes, but only when $y = 0$; The factors are equal when $y = 0$. Other than that, they are not equal.

c. $(x - 10)$ by $(x - 10)$; yes; The factors are equal so the side lengths are the same.

50. $(7x + 5y)$ by $(7x - 5y)$; One side length is $10y$ longer than the other; $5y$

51. **a.** $100p^2 - n^2$

b. $10p$, $10p$, $10p - n$, n, n, $10p - n$

c. $(10p + n)$ by $(10p - n)$; Because the area of the office is 100 $p^2 - n^2$, you can use the difference of two squares pattern to find the dimensions of a rectangular office with the same area.

52. I. C; II. B; III. D; IV. A

53. C

54. **Part A** $12(x + 1)^2$, $3(x + 13)^2$

Part B fabric on left: $12(x + 1)$ by $(x + 1)$, $6(x + 1)$ by $2(x + 1)$, $4(x + 1)$ by $3(x + 1)$; fabric on right: $3(x + 13)$ by $(x + 13)$

Part C fabric on left: $6(x + 1)$ by $2(x + 1)$; fabric on right: $3(x + 13)$ by $(x + 13)$

Part D fabric on left: 66 in. by 22 in.; fabric on right: 69 in. by 23 in.