Name _____

Date _____

5.3 More Trinomials to Factor

1. Factoring the trinomial: $2x^2+7x+3=(2x+1)(x+3)$

3. Factoring the trinomial: $2a^2-a-3=(2a-3)(a+1)$

5. Factoring the trinomial: $3x^2+2x-5=(3x+5)(x-1)$

7. Factoring the trinomial: $3y^2-14y-5=(3y+1)(y-5)$

9. Factoring the trinomial: $6x^2+13x+6=(3x+2)(2x+3)$

11. Factoring the trinomial: $4x^2-12xy+9y^2=(2x-3y)(2x-3y)=(2x-3y)^2$

13. Factoring the trinomial: $4y^2-11y-3=(4y+1)(y-3)$

15. Factoring the trinomial: $20x^2-41x+20=(4x-5)(5x-4)$

17. Factoring the trinomial: $20a^2+48ab-5b^2=(10a-b)(2a+5b)$

19. Factoring the trinomial: $20x^2-21x-5=(4x-5)(5x+1)$

21. Factoring the trinomial: $12m^2+16m-3=(6m-1)(2m+3)$

23. Factoring the trinomial: $20x^2+37x+15=(4x+5)(5x+3)$

25. Factoring the trinomial: $12a^2-25ab+12b^2=(3a-4b)(4a-3b)$

27. Factoring the trinomial: $3x^2-xy-14y^2=(3x-7y)(x+2y)$

29. Factoring the trinomial: $14x^2+29x-15=(2x+5)(7x-3)$

31. Factoring the trinomial: $6x^2-43x+55=(3x-5)(2x-11)$

33. Factoring the trinomial: $15t^2-67t+38=(5t-19)(3t-2)$

35. Factoring the trinomial: $4x^2+2x-6=2\left(2x^2+x-3\right)=2(2x+3)(x-1)$

37. Factoring the trinomial: $24a^2-50a+24=2\left(12a^2-25a+12\right)=2(4a-3)(3a-4)$

39. Factoring the trinomial: $10x^3-23x^2+12x=x\left(10x^2-23x+12\right)=x(5x-4)(2x-3)$

41. Factoring the trinomial: $6x^4-11x^3-10x^2=x^2\left(6x^2-11x-10\right)=x^2(3x+2)(2x-5)$

43. Factoring the trinomial: $10a^3-6a^2-4a=2a\left(5a^2-3a-2\right)=2a(5a+2)(a-1)$

45. Factoring the trinomial: $15x^3-102x^2-21x=3x\left(5x^2-34x-7\right)=3x(5x+1)(x-7)$

47. Factoring the trinomial: $35y^3-60y^2-20y=5y\left(7y^2-12y-4\right)=5y(7y+2)(y-2)$

49. Factoring the trinomial: $15a^4-2a^3-a^2=a^2\left(15a^2-2a-1\right)=a^2(5a+1)(3a-1)$

51. Factoring the trinomial: $24x^2y-6xy-45y=3y\left(8x^2-2x-15\right)=3y(4x+5)(2x-3)$

53. Factoring the trinomial: $12x^2y-34xy^2+14y^3=2y\left(6x^2-17xy+7y^2\right)=2y(2x-y)(3x-7y)$

55. Evaluating each expression when $x = 2$:

$$2x^2 + 7x + 3 = 2(2)^2 + 7(2) + 3 = 8 + 14 + 3 = 25$$

$$(2x+1)(x+3) = (2 \bullet 2 + 1)(2 + 3) = (5)(5) = 25$$

57. Multiplying using the difference of squares formula: $(2x+3)(2x-3) = (2x)^2 - (3)^2 = 4x^2 - 9$

59. Multiplying using the difference of squares formula:

$$(x+3)(x-3)(x^2+9) = (x^2-9)(x^2+9) = (x^2)^2 - (9)^2 = x^4 - 81$$

61. Factoring: $h = 8 + 62t - 16t^2 = 2(4 + 31t - 8t^2) = 2(4-t)(1+8t)$. Now completing the table:

Time t (seconds)	0	1	2	3	4
Height h (feet)	8	54	68	50	0

63. **a**. Factoring: $V = 99x - 40x^2 + 4x^3 = x(99 - 40x + 4x^2) = x(9-2x)(11-2x)$

b. The original dimensions were 9 inches by 11 inches.

65. Multiplying: $(x+3)(x-3) = x^2 - (3)^2 = x^2 - 9$

67. Multiplying: $(x+5)(x-5) = x^2 - (5)^2 = x^2 - 25$

69. Multiplying: $(x+7)(x-7) = x^2 - (7)^2 = x^2 - 49$

71. Multiplying: $(x+9)(x-9) = x^2 - (9)^2 = x^2 - 81$

73. Multiplying: $(2x-3y)(2x+3y) = (2x)^2 - (3y)^2 = 4x^2 - 9y^2$

75. Multiplying: $(x^2+4)(x+2)(x-2) = (x^2+4)(x^2-4) = (x^2)^2 - (4)^2 = x^4 - 16$

77. Multiplying: $(x+3)^2 = x^2 + 2(x)(3) + (3)^2 = x^2 + 6x + 9$

79. Multiplying: $(x+5)^2 = x^2 + 2(x)(5) + (5)^2 = x^2 + 10x + 25$

81. Multiplying: $(x+7)^2 = x^2 + 2(x)(7) + (7)^2 = x^2 + 14x + 49$

83. Multiplying: $(x+9)^2 = x^2 + 2(x)(9) + (9)^2 = x^2 + 18x + 81$

85. Multiplying: $(2x+3)^2 = (2x)^2 + 2(2x)(3) + (3)^2 = 4x^2 + 12x + 9$

87. Multiplying: $(4x-2y)^2 = (4x)^2 - 2(4x)(2y) + (2y)^2 = 16x^2 - 16xy + 4y^2$