

Name: _____
Algebra 1Date: _____
Band: _____

Unit 8: Polynomials & Factoring Study Guide

LT#1: Classify, add, and subtract polynomials.**Write each polynomial in standard form. Then name each polynomial based on its degree and number of terms.**

1. $4r + 3 - 9r^2 + 7r$

2. $3 + b^3 + b^2$

3. $3 + 8t^2$

4. $n^3 + 4n^5 + n - n^3$

5. $7x^2 + 8 + 6x - 7x^2$

6. p^3q^3

Simplify. Write each answer in standard form.

7. $(2v^3 - v + 8) + (-v^3 + v - 3)$

8. $(6s^4 + 7s^2 + 7) + (8s^4 - 11s^2 + 9s)$

9. $(4h^3 + 3h + 1) - (-5h^3 + 6h - 2)$

10. $(8z^3 - 3z^2 - 7) - (z^3 - z^2 + 9)$

LT#2: Multiply a monomial by a polynomial.**Simplify each product. Write in standard form.**

11. $5k(3 - 4k)$

12. $4m(2m + 9m^2 - 6)$

13. $6g^2(g - 8)$

14. $3d(6d + d^2)$

15. $-2n^2(5n - 9 + 4n^2)$

16. $q(11 + 8q - 2q^2)$

LT#3: Factor a monomial from a polynomial.

Find the GCF of the terms of each polynomial. Then factor the polynomial.

17. $12p^4 + 16p^3 + 8p$

18. $3b^4 - 9b^2 + 6b$

19. $45c^5 - 63c^3 + 27c$

20. $4g^2 + 8g$

21. $3t^4 - 6t^3 - 9t + 12$

22. $30h^5 - 5h^4 - 15h^3$

23. The GCF of two numbers p and q is 5. Can you find the GCF of $6p$ and $6q$? Explain your answer.

LT#4: Multiply two binomials or a binomial by a trinomial.

LT#5: Find the square of a binomial and to find the product of a sum and difference.

Simplify each product. Write in standard form.

24. $(w + 1)(w + 12)$

25. $(2s - 3)(5s + 4)$

26. $(3r - 2)^2$

27. $(6g + 7)(g - 8)$

28. $(7q + 2)(3q + 8)$

29. $(4n^3 + 5)(3n + 5)$

30. $(t + 9)(t - 3)$

31. $(6c + 5)^2$

32. $(7h - 3)(7h + 3)$

33. $(y - 6)(3y + 7)$

34. $(4a - 7)(8a + 3)$

35. $(4b - 3)(4b + 3)$

36. A rectangle has dimensions $3x + 5$ and $x + 7$. Write an expression for the area of the rectangle as a product and as a polynomial in standard form.

LT#6: Factor trinomials of the form $x^2 + bx + c$.

LT#7: Factor trinomials of the form $ax^2 + bx + c$.

Factor each expression.

37. $g^2 - 5g - 14$

38. $2n^2 + 3n - 2$

39. $6k^2 - 10kl + 4l^2$

40. $p^2 + 8p + 12$

41. $r^2 + 6r - 40$

42. $6m^2 + 25mn + 11n^2$

43. $t^2 - 13t - 30$

44. $2g^2 - 35g + 17$

45. $3x^2 + 3x - 6$

46. $d^2 - 18d + 45$

47. $w^2 - 15w - 54$

48. $21z^2 - 70z + 49$

49. $x^2 + 21x + 38$

50. $10v^2 + 11v - 8$

51. $5g^2 + 15g + 10$

52. Can you factor the expression $2x^2 + 15x + 9$? Explain why or why not.

LT#8: Factor perfect-square trinomials and the differences of two squares.

Factor each expression.

53. $s^2 - 20s + 100$

54. $16q^2 + 56q + 49$

55. $r^2 - 64$

56. $9z^2 - 16$

57. $25m^2 + 80m + 64$

58. $49n^2 - 4$

59. $g^2 - 225$

60. $9p^2 - 42p + 49$

61. $36h^2 - 12h + 1$

62. $w^2 + 24w + 144$

63. $32v^2 - 8$

64. $25x^2 - 36$

65. Find an expression for the length of a side of a square with an area of $9n^2 + 54n + 81$.

66. Suppose you are using algebra tiles to factor a quadratic trinomial. What do you know about the factors of the trinomial when the tiles form a square?

LT#9: Factor higher-degree polynomials by grouping.

Find the GCF of the first two terms and the GCF of the last two terms for each polynomial.

67. $6y^3 - 3y^2 + 2y - 1$

68. $8m^3 + 40m^2 + 6m + 15$

Factor completely.

69. $6d^4 + 4d^3 - 6d^2 - 4d$

70. $11b^3 - 6b^2 + 11b - 6$

71. $45z^3 + 20z^2 + 9z + 4$

72. $9a^3 - 12a^2 + 18a - 24$